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ARTICLE

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AlphaTest Medicina in inglese

1200 QUIZ

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nel novembre 2016

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PREFAZIONE

Per molti giovani l'iscrizione all'università è, da diversi anni, subordinata al superamento di un esame che ha lo scopo di valutare la potenzialità dei singoli studenti nel frequentare con profitto il corso di laurea prescelto.

Per molti giovani di tutto il mondo l'iscrizione all'università è da diversi anni subordinata al superamento di una selezione preliminare che ha lo scopo di valutare le potenzialità dei singoli studenti di frequentare con profitto il corso di laurea prescelto.

Attualmente in Italia, molti corsi di alcune importanti università private, alcuni corsi di laurea magistrale a ciclo unico a livello nazionale (Medicina e Chirurgia, Odontoiatria e Protesi dentaria, Medicina Veterinaria, Scienze della Formazione primaria e Architettura) e molti corsi di laurea triennali sono caratterizzati dalla presenza del **numero programmato**: il numero di matricole di questi corsi non può superare il numero di posti programmati annualmente in ogni ateneo.

In generale, la selezione dei candidati che desiderano accedere a un corso universitario a numero programmato viene effettuata sulla base di una prova a test, composta da domande a risposta multipla che valuta il possesso di determinate attitudini e conoscenze. Il risultato di tale prova – predisposta in alcuni casi a cura del ministero dell'Università e della Ricerca (come, per esempio, le prove di accesso ai corsi di Medicina/Odontoiatria e Veterinaria) e in altri casi dalle singole università – determina un **punteggio** in base al quale viene stabilita la **graduatoria dei candidati**. In alcuni casi, alla formazione della graduatoria finale contribuiscono anche i risultati conseguiti dai singoli candidati negli ultimi anni della scuola superiore; il risultato del test è comunque in generale il fattore di gran lunga più importante ai fini dell'ammissione.

Oltre alle prove selettive, sono ormai in uso in molte sedi universitarie le **prove valutative** per i corsi ad accesso libero il cui scopo è misurare il possesso di conoscenze e attitudini necessarie per frequentare con profitto il corso prescelto; tali prove attribuiscono – in caso di valutazione negativa – un "debito" formativo che lo studente dovrà "saldare" entro il primo anno di corso dimostrando di aver colmato le lacune rilevate. Anche chi sceglie di frequentare un corso universitario ad accesso libero deve quindi spesso affrontare una prova a test.

La presenza del test di pre-immatricolazione, selettivi o "orientativi", impone quindi agli studenti seriamente motivati di prepararsi in modo mirato al test che dovranno sostenere.

Alpha Test è la prima e la più importante organizzazione in Italia che da 30 anni offre agli studenti tutti gli strumenti necessari per affrontare con successo i test selettivi. Opera a livello nazionale con sedi nelle principali città universitarie e si avvale della collaborazione di decine di esperti. Per le diverse prove di ammissione, Alpha Test organizza in tutta Italia dei corsi specifici di preparazione (alphatest.it/Corsi), pubblica la collana *Test Universitari* composta da oltre settanta tra manuali ed eserciziari, specifici per ogni area di studi (alphatest.it/Libri-Alpha-Test) e ha sviluppato Alpha Test Academy, il nuovo programma on line di assistenza personalizzata allo studio, che guida e aiuta lo studente nella preparazione al test.

In particolare, questo libro è dedicato a coloro che intendono prepararsi ai test di ammissione ai corsi universitari di *Medicina e Chirurgia in lingua inglese*, che dal 2011 sono previsti anche in Italia.

Il parere dei lettori è importante

Per continuare a migliorare la qualità delle proprie pubblicazioni, Alpha Test considera estremamente prezioso il parere dei propri lettori ai quali chiede la cortesia di esprimere un giudizio su questo libro nell'apposita sezione "Valuta un libro" del sito alphatest.it. Per ogni valutazione ricevuta Alpha Test devolverà 2 euro alla **Fondazione Francesca Rava-NPH Italia Onlus** che aiuta i bambini orfani, abbandonati o ammalati, in Italia e nei paesi più poveri del mondo (www.nphitalia.org).

Per informazioni aggiornate sui libri di Alpha Test i lettori possono visitare il sito internet **www.alphatest.it** o richiedere il catalogo gratuito a:

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Ringraziamenti

Alpha Test ringrazia inoltre i numerosi lettori, i partecipanti ai corsi e i collaboratori che, con i loro interventi, suggerimenti e in particolare con i giudizi ogni anno forniti al termine dei corsi, hanno contribuito a migliorare nel tempo la qualità dei volumi e dei servizi offerti.

Suggerimenti per prepararsi al test

La **prima cosa** da fare è procurarsi le informazioni sul test che si dovrà affrontare: le fonti più autorevoli e aggiornate sono il sito del ministero dell'Istruzione, dell'Università e della Ricerca (MIUR), i siti delle singole università e alphatest.it. Nel primo è riportata la normativa di interesse per gli studenti mentre negli altri vengono pubblicati i bandi di concorso che integrano le indicazioni del ministero con le specifiche proprie di ciascuna sede universitaria. Su alphatest.it/Test-di-ammissione sono pubblicate le date dei test, tutte le principali leggi e normative sulle prove di ammissione, i test ufficiali degli ultimi anni risolti e commentati e gli aggiornamenti e approfondimenti per i diversi corsi di studio.

Il metodo Alpha Test: libri, Alpha Test Academy, corsi

Il primo passo per il conseguimento di una preparazione completa è costituito dallo studio individuale da compiere sui libri. A questo volume si affiancano il corrispondente **I TEST DI MEDICINA IN LINGUA INGLESE - MANUALE** e il volume **I TEST DI MEDICINA IN LINGUA INGLESE - ESERCIZI COMMENTATI**. Ai fini dello studio, ciascuno dei tre volumi è autosufficiente e, allo stesso tempo, complementare rispetto agli altri. Le loro caratteristiche sono così sintetizzabili:

- **MANUALE DI PREPARAZIONE:** è il principale strumento di preparazione sulle materie scientifiche delle prove di ammissione in inglese. Consente infatti lo **studio** e il **ripasso** mirato delle materie scientifiche su cui vertono le domande dei test; la spiegazione degli argomenti è completata numerosi esercizi in inglese risolti e commentati;
- **I TEST DI MEDICINA IN LINGUA INGLESE - ESERCIZI COMMENTATI:** è un eserciziarlo contenente centinaia di quesiti suddivisi in base alle materie oggetto d'esame. Di ciascun quesito viene fornita la soluzione e il commento che illustra i metodi risolutivi più efficaci. Costituisce dunque uno strumento utile per **esercitarsi** e per **approfondire la propria preparazione**;
- **1200 QUIZ - I QUESITI DELLE PROVE DI AMMISSIONE:** è la raccolta di quesiti delle prove ufficiali e di numerose domande rese disponibili dal Ministero o dalle università.

Per chi, oltre al test per i corsi in lingua inglese, intende sostenere anche la prova in lingua italiana, Alpha Test propone i volumi **MANUALE DI PREPARAZIONE**, **ESERCIZI COMMENTATI**, **PROVE DI VERIFICA** e **11.000 quiz**.

L'acquisto di ogni libro della collana *TestUniversitari* dà anche diritto a svolgere gratuitamente numerose simulazioni del test ufficiale sul sito testonline.it. Per questo si rimanda alle Istruzioni riportate nell'apposita pagina in fondo al volume.

Alpha Test Academy

Alpha Test Academy è il nuovo sistema di assistenza on line personalizzata che guida e aiuta lo studente nella preparazione ai test per Medicina/Odontoiatria e Veterinaria. Per ciascuna delle materie e degli argomenti previsti al test, il programma valuta il livello di preparazione dello studente, propone in modo adattivo numerose batterie di domande con difficoltà differenziata e offre migliaia di spiegazioni e commenti multimediali (link, video, tutorial e rimandi a specifici richiami di teoria). Il materiale e l'assistenza offerti da Alpha Test Academy consentono di chiarire via via ogni quesito e dubbio individuale anche attraverso un canale diretto con i docenti Alpha Test e di migliorare progressivamente le proprie conoscenze e capacità in vista del test ufficiale. Alpha Test Academy assiste in ogni momento lo studente in un lavoro di preparazione mirato e specifico e rappresenta quindi un'utile integrazione al manuale di preparazione o a un corso Alpha Test in aula. Alpha Test Academy è un ambiente interattivo, con gruppi di studio virtuali e forum di discussione per un confronto diretto. Inoltre, fornisce un costante aggiornamento sulle novità normative e sui test ufficiali.

Per l'acquisto di Alpha Test Academy è previsto uno sconto importante per chi già possiede questo volume o è iscritto a un corso Alpha Test. Per maggiori informazioni o per provare la demo gratuita: alphatest.it

Corsi

Per la preparazione alle prove di ammissione, oltre ai volumi della collana *TestUniversitari* e ad Alpha Test Academy, Alpha Test organizza per gli studenti più motivati numerosi **corsi** di durata differenziata (da pochi giorni di corso ad alcuni mesi). Frequentare un corso Alpha Test consente di completare, perfezionare e consolidare la propria preparazione grazie ai seguenti punti di forza:

1. **la didattica interattiva.** Ciascun corso prevede cicli di lezioni e di esercitazioni dedicate al ripasso di tutti gli argomenti oggetto d'esame. Gli studenti possono beneficiare della professionalità di docenti con un'esperienza d'insegnamento unica in Italia, maturata in 30 anni di attività di Alpha Test nel campo specifico della preparazione ai test universitari;
2. **il materiale supplementare consegnato ai corsi.** Durante le lezioni, a ciascun partecipante viene fornito materiale di studio e di esercitazione aggiuntivo rispetto ai volumi consegnati al momento dell'iscrizione. Si tratta di materiale estremamente aggiornato e specifico per la struttura e i contenuti del test che si deve affrontare;
3. **l'esperienza "sul campo".** In ciascun corso vengono svolte più simulazioni d'esame per mettersi alla prova e per confrontare la propria preparazione con quella di altri candidati. I docenti Alpha Test sono in grado inoltre di indicare a ogni candidato il punteggio orientativo che occorre conseguire per accedere al corso universitario prescelto.

Infine, chi desidera prepararsi al test di ammissione senza rinunciare a divertimento e nuove amicizie può partecipare a una delle **vacanze-studio Alpha Test** (per informazioni: alphatest.it/Corsi).

Test di autovalutazione online

Su alphatest.it/Test-di-ammissione è possibile misurare il proprio livello di preparazione; il test gratuito prevede 20 domande tratte dai test ufficiali degli ultimi anni da risolvere in 20 minuti ed è finalizzato ad aiutare il candidato a impostare al meglio il percorso di studio.

Test ufficiali commentati e ultimi aggiornamenti disponibili su alphatest.it

Sul sito alphatest.it si possono scaricare gratuitamente i test ufficiali degli ultimi anni con tutte le soluzioni e i **commenti esplicativi dei singoli quesiti**. In particolare nella sezione "approfondimenti" all'indirizzo alphatest.it/Test-di-ammissione sono disponibili i test ufficiali dei corsi di laurea in Medicina/Odontoiatria e Veterinaria.

Sulla stessa pagina vengono costantemente pubblicati gli aggiornamenti normativi sui test con le eventuali integrazioni agli argomenti e ai programmi d'esame.

App per iPhone e iPad

Per coloro che possiedono i dispositivi mobili iPhone e iPad sono disponibili le App di esercitazione del test d'ammissione per tutti i corsi a numero programmato. Ciascuna App contiene oltre 580 quesiti tratti dalle prove ufficiali, con soluzioni commentate dagli esperti Alpha Test. È possibile comporre un numero illimitato di prove simulate e analizzare i risultati anche in forma grafica.

Segui Alpha Test anche sui social network

Diventare fan della pagina Alpha Test su Facebook o seguire l'account @alpha_test su Twitter significa essere informati in tempo reale su tutto quello che riguarda i test, confrontarsi con migliaia di fan e ricevere aggiornamenti e consigli dai docenti. Alpha Test è anche su Google+, LinkedIn, Youtube.

Mailing list

Ti segnaliamo infine che, registrandoti su alphatest.it, puoi entrare a far parte della nostra mailing list: potrai così ricevere aggiornamenti in tempo reale sui test, suggerimenti su come prepararti al meglio e approfittare di sconti e promozioni esclusive.

Indicazioni per i partecipanti ai corsi Alpha Test

Alpha Test:

- è la **prima** società in Italia specializzata nel preparare gli studenti ai test di ammissione all'università;
- è l'**unica** organizzazione che può vantare un'esperienza di 30 anni e migliaia di corsi già organizzati su tutto il **territorio nazionale**;
- i risultati di chi sceglie Alpha Test sono gli unici attestati da una primaria società di indagini di mercato da cui risulta che l'**84%** degli ammessi a medicina si è preparato con Alpha Test;
- dal 1987 a oggi ha **preparato con successo** ai test universitari **decine di migliaia di studenti** che si sono trovati in vantaggio rispetto alle altre aspiranti matricole;
- propone **corsi** con durata, programmi e costi differenziati a seconda della prova di selezione e delle esigenze dei singoli studenti, comprese **vacanze-studio** e **corsi residenziali**;
- vanta un corpo docente composto da oltre 160 esperti rigorosamente selezionati e costantemente formati: docenti e ricercatori universitari, professionisti e insegnanti con un'**esperienza didattica unica e specifica** nel campo della preparazione ai test universitari;
- ha sviluppato, per prima in Italia, una **metodologia didattica innovativa** e specifica per affrontare le prove a test;
- effettua l'analisi e la discussione in aula delle **prove ufficiali** utilizzate dalle università negli anni passati;
- sottopone ai partecipanti ai corsi numerose **prove simulate** che vengono corrette individualmente mediante l'uso di **lettori ottici** simili a quelli per le correzioni dei test ufficiali; ciò consente ai partecipanti di verificare in tempo reale il proprio livello di preparazione e di apprendimento;
- ha sviluppato una collana di volumi specifici per i diversi test di ammissione, già scelti da oltre due milioni di studenti e **forniti ai partecipanti ai corsi** all'atto dell'iscrizione;
- mette a disposizione degli studenti un servizio di esercitazione *on line* – all'indirizzo **testonline.it** – dove è possibile simulare i test di ammissione ai singoli corsi di studio.

Quanto premesso, unitamente ai risultati conseguiti dai partecipanti alle passate edizioni, ci consente di affermare che prepararsi a un test di ammissione frequentando lo specifico corso Alpha Test rappresenta la scelta migliore per chi è veramente motivato ad accedere al corso universitario desiderato e aumenta fino a sette volte la probabilità di ammissione rispetto a quella degli altri candidati.

Alpha Test e il suo corpo docente mettono a disposizione l'esperienza maturata e forniscono tutto l'aiuto necessario affinché i propri studenti possano prepararsi nel modo più rapido, completo ed efficace alla prova di selezione. Per accrescere ulteriormente la probabilità di successo è **essenziale anche l'impegno** degli studenti sotto forma di studio e di esercitazione **prima e durante** lo svolgimento del corso. Per facilitare la preparazione preliminare, Alpha Test consegna, già all'atto dell'iscrizione, i volumi di studio. Consigliamo di leggere questi libri (o almeno il manuale) prima dell'inizio del corso con l'obiettivo di acquisire almeno una conoscenza di base degli argomenti trattati. Questa raccomandazione vale in particolare modo per chi sceglie di frequentare uno dei corsi Alpha Test di durata minore.

Sempre al momento dell'iscrizione al corso, Alpha Test fornisce una guida operativa con istruzioni e consigli utili per avviare la preparazione anche prima dell'inizio delle lezioni e con importanti informazioni sui test di ammissione di interesse dello studente.

Durante il corso l'attenzione viene focalizzata in modo specifico sulle tipologie di quesiti previsti nella prova di ammissione di interesse. Viene inoltre esaminato e discusso con i docenti un consistente numero di esercizi diversi da quelli presenti nei libri e contenuti in apposite dispense aggiornate ogni anno e distribuite durante il corso esclusivamente ai partecipanti.

Informazioni e modalità di iscrizione ai corsi Alpha Test

Le iscrizioni ai corsi Alpha Test per la preparazione ai test di ammissione universitari sono sempre aperte sino all'esaurimento dei posti disponibili (i corsi sono riservati a un numero limitato di partecipanti per garantire le migliori condizioni di apprendimento); le informazioni aggiornate relative al calendario e alla quota di partecipazione di ciascun corso sono disponibili su alphatest.it o chiamando il numero verde 800 017 326.

Per chi ha già acquistato **presso un centro Alpha Test** l'ultima edizione dei libri in dotazione al corso, è prevista una riduzione della quota di iscrizione al corso pari al 100% del prezzo di copertina dei libri; se i libri sono stati acquistati **in libreria** tale riduzione è invece pari al 50% del prezzo di copertina.

L'iscrizione ai corsi e l'acquisto dei libri Alpha Test possono essere effettuati:

- **su Internet** all'indirizzo alphatest.it/Corsi;
- **telefonicamente**, chiamando il numero verde 800 017 326;
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Natura del test e caratteristiche di questo libro

Prove ministeriali

IMAT: struttura del test, materie e graduatoria di merito

Ogni anno il Ministero pubblica, almeno 60 giorni prima della data prevista per lo svolgimento del test, il decreto con il quale definisce le modalità e i contenuti delle prove di ammissione ai corsi di laurea programmati a livello nazionale.

A partire dall'anno accademico 2011-2012, tale decreto ha previsto l'introduzione del **test in inglese** per l'ammissione ai corsi di Medicina e Chirurgia in lingua inglese nelle sedi universitarie di Bari, Milano, Pavia, Roma La Sapienza, Roma "Tor Vergata", Napoli Federico II e Napoli Seconda Università. La prova di ammissione in lingua inglese, denominata IMAT (*International Medical Admissions Test*), per l'anno accademico 2016-17 si è svolta in settembre in contemporanea in tutte le sedi riportate e predisposta dal Ministero in collaborazione con il Cambridge Assessment. La prova di ammissione per l'anno **2016-2017** era composta da **60 quesiti** con **cinque opzioni di risposta**, di cui una soltanto corretta, su argomenti di:

- | | |
|-----------------------|------------|
| • ragionamento logico | 20 quesiti |
| • cultura generale | 2 quesiti |
| • biologia | 18 quesiti |
| • chimica | 12 quesiti |
| • fisica e matematica | 8 quesiti |

Per svolgere la prova è stato assegnato un **tempo massimo di svolgimento pari 100 minuti**. Nella valutazione delle prove sono stati attribuiti 1,5 punti per ogni risposta esatta, una penalità pari a - 0,4 punti per ogni risposta errata e 0 punti per ogni risposta omissa. Il punteggio massimo conseguibile con il test è stato dunque pari a 90 punti.

Nella tabella seguente vengono riportati alcuni dati relativi ai risultati del test di selezione con classifica nazionale di **Medicina in inglese dell'a.a. 2015/2016** in base alla prima graduatoria pubblica, senza considerare gli eventuali ripescaggi intervenuti successivamente.

n° dei presenti 3.475	Classifica	Punteggi					
		Ragionamento logico	Cultura generale	Biologia	Chimica	Matematica e Fisica	Totale
	1°	20,50	0,00	25,50	13,10	12,00	71,10
	10°	20,20	0,00	21,70	11,60	9,00	62,50
	20°	15,30	1,10	17,90	14,20	8,60	57,10
	30°	15,70	1,50	16,80	8,60	12,00	54,60
	40°	10,00	0,00	17,90	13,10	12,00	53,00
	50°	19,00	1,10	17,90	6,70	7,10	51,80
	60°	13,30	0,00	14,10	16,10	7,10	50,60
	70°	9,20	0,00	20,20	16,10	4,10	49,60

n° dei presenti 3.475	Classifica	Punteggi					
		Ragionamento logico	Cultura generale	Biologia	Chimica	Matematica e Fisica	Totale
	80°	10,30	-0,40	23,20	7,40	8,20	48,70
	90°	19,40	1,50	14,10	7,80	5,20	48,00
	100°	8,50	0,00	10,70	16,10	12,00	47,30
	110°	6,30	0,00	16,80	13,10	10,50	46,70
	120°	8,90	1,50	16,00	11,20	8,60	46,20
	130°	16,00	0,00	18,30	8,60	2,60	45,50
	140°	16,00	-0,40	19,80	6,30	3,30	45,00
	150°	5,20	-0,40	18,30	14,60	6,70	44,40
	160°	10,00	0,00	13,40	10,10	10,50	44,00
	170°	9,70	0,00	14,50	7,40	12,00	43,60
	180°	15,60	-0,40	19,80	7,10	1,10	43,20
	190°	8,60	0,00	14,10	11,20	9,00	42,90
	200°	13,70	0,00	11,80	10,80	6,00	42,30
	204°	23,80	0,00	15,70	9,00	3,70	42,20
	210°	11,50	1,50	11,90	10,10	7,10	42,10
	220°	14,50	-0,40	15,70	10,50	1,50	41,80

Humanitas International Medical School

Per l'anno accademico 2016-2017 la prova di ammissione al corso di laurea in **Medicine and Surgery** dell'università **Humanitas** si è svolta in settembre ed era composta da **60 quesiti** su argomenti di:

- ragionamento logico 22 quesiti
- cultura generale 2 quesiti
- biologia 18 quesiti
- chimica 12 quesiti
- fisica e matematica 8 quesiti

Il tempo complessivo a disposizione per risolvere i quesiti era di **100 minuti** e la valutazione risponde ai seguenti criteri:

- 1,5 punto per ogni risposta esatta;
- - 0,4 punti per ogni risposta sbagliata;
- 0 punti per ogni risposta omessa.

Per svolgere la prova è stato assegnato un **tempo massimo di svolgimento pari 100 minuti**. Nella valutazione delle prove sono stati attribuiti 1,5 punti per ogni risposta esatta, una penalità pari a - 0,4 punti per ogni risposta errata e 0 punti per ogni risposta omessa. Il punteggio massimo conseguibile con il test è stato dunque pari a 90 punti.

International MD Program dell'Università Vita-Salute San Raffaele

L'ateneo privato milanese ha istituito da qualche anno un corso di laurea in lingua inglese denominato *International MD program*. La prova (in lingua inglese) nel 2016 si è svolta nel mese di agosto e ha previsto un test composto da 100 domande da risolvere in 120 minuti (2 ore) così ripartite:

- 50 domande di logica e *problem solving*;

- 10 domande di comprensione di un testo;
- 40 domande di carattere scientifico sulle materie di biologia (18 domande), chimica (12 domande), matematica (5 quesiti) e fisica (5 quesiti).

Il San Raffaele ha utilizzato i seguenti criteri per la valutazione delle risposte: 1 punto per ogni risposta esatta, una penalità pari a - 0,25 punti per ogni risposta errata e 0 punti per ogni risposta omissa; non era possibile effettuare correzioni sulla scheda delle risposte.

In caso di parità di punteggio, ha prevalso, in ordine decrescente, il punteggio ottenuto dal candidato nella soluzione, rispettivamente, dei quesiti relativi agli argomenti di logica e problem solving, biologia, chimica, fisica e matematica. In caso di ulteriore parità di punteggio è stata attribuita la priorità al soggetto anagraficamente più giovane. Sono stati ammessi al corso di laurea in Medicina e Chirurgia e Odontoiatria gli studenti che hanno ottenuto un punteggio pari o superiore al 50° percentile del punteggio massimo ottenuto, intendendosi inoltre che sopra tale soglia il test risultava superato senza Obblighi Formativi Aggiuntivi. Nel caso di un punteggio ottenuto inferiore a 50° percentile, lo studente dovrà sottoporsi a un colloquio preliminare all'eventuale immatricolazione e recuperare gli Obblighi Formativi Aggiuntivi nel corso del primo anno accademico. Non sono stati ammessi all'immatricolazione né al colloquio gli studenti che avessero conseguito un punteggio inferiore al 30° percentile del punteggio massimo ottenuto. Sono stati ammessi al corso di laurea in Medicina e Chirurgia in Inglese, per il quale però sono state stilate due graduatorie distinte: una per cittadini italiani, comunitari e non comunitari residenti e una per cittadini non comunitari residenti all'estero, gli studenti che hanno ottenuto un punteggio pari o superiore a 35/100; il test risultava superato senza OFA (Obblighi Formativi Aggiuntivi) se il candidato raggiungeva il punteggio pari o superiore a 40/100.

Per formalizzare l'iscrizione al corso di laurea in Medicina e Chirurgia in Inglese è inoltre indispensabile essere in possesso di una certificazione di conoscenza della lingua inglese pari al livello C1 del quadro Comune europeo di riferimento per la conoscenza delle lingue (QCER). Sono esenti gli studenti che possono dimostrare di aver studiato almeno negli ultimi due anni precedenti presso Scuole Secondarie Superiori in cui i programmi siano stati svolti interamente in inglese.

Medicine and Surgery dell'Università Cattolica di Roma

Per l'anno accademico 2017-2018 per i corsi di laurea magistrale a ciclo unico in Medicine and Surgery, l'Università Cattolica del Sacro Cuore ha previsto un test di selezione il 20 febbraio 2017.

Il test (*computer-based*) consiste nella soluzione di **100 quesiti a risposta multipla** così ripartiti:

- **95 domande di natura psico-attitudinale:** logica, ragionamento spaziale visivo, comprensione brani, attenzione e precisione, ragionamento numerico, problem solving;
- **5 domande riguardanti cultura religiosa e etica.**

Per lo svolgimento della prova è assegnato un tempo massimo di **100 minuti**.

Per la valutazione della prova di ammissione sono applicati i seguenti criteri:

- 1 punto per ogni risposta esatta;
- meno 0,25 punti per ogni risposta errata;
- 0 punti per ogni risposta non data.

Il punteggio minimo per passare il test è di 35/100, quindi solo chi ha fatto almeno 35 punti può partecipare alla formazione della graduatoria.

Caratteristiche del libro

Questo volume consente agli studenti di ottimizzare la preparazione per lo svolgimento delle prove in lingua inglese con le caratteristiche appena descritte. Contiene centinaia di esercizi risolti esemplificativi dei test previsti nelle prove di ammissione a Medicina e Chirurgia in lingua inglese.

In particolare, i **1200 quesiti** contenuti nel volume sono così ripartiti:

- 500 quesiti di logica (sillogismi, interpretazione di tabelle e grafici statistici, problemi di ragionamento logico e matematico, problemi di insiemistica, successioni di numeri e lettere, proporzioni tra parole, sinonimi e contrari, comprensione di brani);
- 100 quesiti di cultura generale (storia, letteratura, arte e architettura, geografia, diritto ed economia);
- 250 quesiti di biologia;
- 150 quesiti di chimica;
- 100 quesiti di fisica;
- 100 quesiti di matematica.

Suggerimenti per affrontare al meglio il test

Per affrontare al meglio un test a risposta multipla è importante conoscere preventivamente le modalità di svolgimento e la natura delle diverse tipologie di esercizi, nonché le opportune "strategie" per valorizzare al massimo le proprie conoscenze e potenzialità.

I criteri adottati dalle università italiane per selezionare i candidati ai corsi universitari sono di tipo **comparativo**. Cioè per superare la selezione, **lo studente deve figurare tra i migliori** nella graduatoria dei candidati. In altre parole, per superare la selezione occorre svolgere il test di ammissione meglio di un certo numero di altri candidati. Dal 2011 i test di ammissione a base nazionale prevedono anche una soglia minima qualificante di 20 punti.

Prima di addentrarsi nell'analisi dei contenuti dei test e degli esercizi che li compongono, è opportuno considerare alcuni suggerimenti apparentemente banali, ma utili al fine di ottimizzare il risultato nella prova di ammissione.

Bando di concorso e informazioni sulla selezione

Il primo suggerimento di carattere generale è quello di **prestare grande attenzione a tutte le informazioni fornite dall'università e contenute nel bando di concorso**: esse sono infatti, insieme alle disposizioni del Ministero, le uniche informazioni **ufficiali** relative alle norme, alle modalità di selezione, alla struttura e ai contenuti della prova che regola l'ammissione al corso di studi scelto.

Regolamento e istruzioni

In sede d'esame, prima ancora dell'inizio della prova, vengono consegnate ai candidati le **norme alle quali attenersi durante l'intero svolgimento del test**. Tali norme riguardano, per esempio, il tempo a disposizione per lo svolgimento della prova, le modalità con cui indicare le risposte sull'apposita scheda e altre indicazioni su come comportarsi in sede d'esame e al termine del test. È necessario attenersi a tali informazioni per evitare di commettere errori banali (quale, per esempio, la compilazione errata della scheda per le risposte), che potrebbero compromettere l'esito della prova e quindi l'ammissione all'università.

In alcuni casi, all'interno del test gli esercizi sono preceduti da **istruzioni circa le modalità di risoluzione** dei quesiti e a volte anche da un esempio risolto. È importante in questi casi non aver fretta di cominciare a risolvere i quesiti, ma dedicare la massima attenzione alla lettura di queste istruzioni, indispensabili per capire la logica degli esercizi e per rispondere correttamente alle domande.

Domande a risposta multipla

I test che vengono utilizzati per l'ammissione all'università sono costituiti da domande **chiuse**, le cui risposte sono cioè predefinite: il candidato deve individuare la sola risposta esatta tra le alternative proposte. Per rispondere a una domanda **aperta** (non corredata da risposte prefissate) come per esempio "Qual è la capitale della Colombia?", occorre conoscere le informazioni necessarie alla formulazione della risposta. Nel caso di domande a scelta multipla è invece possibile procedere anche in maniera diversa.

Si ipotizzi, per esempio, di dover rispondere al medesimo quesito, però a risposta multipla.

1 Qual è la capitale della Colombia?

- A** Delhi
- B** Buenos Aires
- C** Bogotá
- D** Brasilia
- E** Santiago

In questo caso è possibile determinare la risposta corretta procedendo in due modi distinti:

1. ragionando come se si trattasse di una domanda aperta: sapendo che la capitale della Colombia è Bogotá, si individua direttamente la risposta corretta (**C**) senza valutare le altre risposte proposte;
2. se, al contrario, non si conosce la risposta alla domanda, ma si ricordano gli altri accoppiamenti Paese/capitale, è possibile individuare la risposta corretta eliminando le alternative: sapendo che Delhi è la capitale dell'India, Buenos Aires dell'Argentina, Santiago del Cile e Brasilia del Brasile, per esclusione si può concludere che la risposta esatta è la **C**.

In altre parole, per rispondere correttamente a una domanda a scelta multipla non è sempre strettamente necessario conoscere la risposta esatta: a volte la soluzione può essere individuata indirettamente, escludendo le alternative errate.

Nel caso in cui, procedendo per esclusione, il candidato non riesca a eliminare tutte le alternative errate, il metodo di risposta per eliminazione permette comunque di aumentare le probabilità di individuare la risposta corretta: l'esclusione di una o più risposte riduce il numero delle alternative tra cui si rimane incerti e quindi incrementa la probabilità di individuare l'alternativa corretta anche rispondendo in modo casuale.

Un altro aspetto che caratterizza le prove a test è il fatto che l'assegnazione dei punteggi si basa solo ed esclusivamente sulle risposte indicate sull'apposita scheda: non hanno quindi alcuna rilevanza eventuali spiegazioni o giustificazioni alle risposte date e questo rappresenta un'ulteriore differenza importante rispetto ad altri tipi di valutazione.

Nei test di ammissione il tempo a disposizione risulta spesso appena sufficiente per rispondere a tutti i quesiti. È dunque molto importante gestirlo nel modo più conveniente.

Valore dei quesiti e gestione del tempo

Nei test di ammissione ai quali questo libro si rivolge **tutti gli esercizi hanno lo stesso valore**: è dunque necessario evitare di dedicare eccessivi sforzi e tempo per risolvere un quesito particolarmente complesso. Poiché ogni risposta giusta fa "guadagnare" lo stesso punteggio, a parità di tempo impiegato conviene risolvere due esercizi semplici piuttosto che uno complesso.

Come i partecipanti ai corsi Alpha Test hanno modo di sperimentare durante lo svolgimento delle prove simulate, il tempo rappresenta uno dei fattori critici per affrontare con successo un test di ammissione. Infatti, le prove sono spesso progettate e formulate in modo tale da permettere solo ai più preparati e ai più veloci di terminare nel tempo concesso la totalità dei quesiti.

È dunque fondamentale impiegarlo razionalmente, calcolando, prima di iniziare la prova, il tempo medio a disposizione per ogni quesito (dato ovviamente dal tempo complessivo diviso per il numero di esercizi), ed evitando di dedicare ai singoli quesiti un tempo eccessivamente superiore a quello medio. Il suggerimento generale è di non superare il tempo medio nello svolgimento di un singolo esercizio, per più del 20%. Questa dilazione per i quesiti complessi viene infatti facilmente compensata dalla presenza di numerosi quesiti di natura nozionistica di veloce risoluzione.

Se dunque il tempo complessivo per il test è di 100 minuti e il numero di esercizi da risolvere è pari a 60, il tempo medio per quesito è pari a 1 minuto e 40 secondi (100 secondi). Bisogna quindi cercare di non dedicare più di due minuti allo svolgimento del singolo quesito. Avvicinandosi a tale tempo limite, se non si è prossimi alla soluzione, è opportuno passare alla domanda successiva.

L'obiettivo da raggiungere è rispondere correttamente al maggior numero possibile di esercizi; si consiglia quindi, compatibilmente con i vincoli imposti dalle modalità di svolgimento della prova, di affrontare prima gli esercizi che si ritiene di saper risolvere più facilmente e velocemente, per passare poi a quelli più complessi che richiedono un dispendio di tempo maggiore.



Il consiglio, ove possibile, è di evidenziare con un opportuno segno di riconoscimento tali quesiti sul fascicolo contenente il test: sarà così possibile ritrovarli velocemente in un secondo momento. Lo stesso consiglio vale per le domande a cui si è data una risposta che, compatibilmente con il tempo a disposizione, si vorrebbe verificare prima del termine della prova.

Scelta casuale della risposta?

La valutazione dei test avviene mediante l'attribuzione di un punteggio positivo per le risposte corrette (generalmente un punto per ogni risposta esatta) e, in molti casi, l'attribuzione di un punteggio negativo per ogni risposta errata (generalmente quantificato in una frazione di punto). Ai quesiti omessi, a cui cioè non si è risposto, viene di solito attribuito un punteggio nullo.

Per esempio l'edizione 2015 dei test ministeriali ai quali questo volume si rivolge prevedeva quesiti con 5 alternative e la seguente attribuzione di punteggi:

- risposta esatta: +1,5
- risposta errata: -0,4
- risposta omessa: 0

La penalità sulle risposte errate ha lo scopo di annullare il punteggio positivo che, statisticamente, il candidato potrebbe conseguire rispondendo a caso in assenza di tale penalità.

Ma è allora conveniente o no rispondere a caso ai quesiti che non si sanno risolvere?

Si supponga di non conoscere le risposte di 60 quesiti (con 5 risposte alternative ciascuno) della prova. Scegliendo a caso (e ragionando statisticamente) si risponderebbe in modo corretto a un esercizio ogni 5, ossia in totale a 12 esercizi (60/5 ossia 60 diviso 5) e si sbaglierebbero i restanti 48 quesiti. Il punteggio totalizzato sarebbe dunque:

- Risposte esatte: $12 \times (+1,5) = +18$
- Risposte errate: $48 \times (-0,4) = -19,2$
- Risposte nulle: $0 \times 0 = 0$
- Punteggio totale: $18 - 19,2 = -1,2$

Si otterrebbe quindi un punteggio negativo: è quindi **sconsigliato rispondere a caso quando si è indecisi tra cinque alternative**.

È evidente però che il punteggio totalizzato rispondendo casualmente potrà essere tanto maggiore quanto minore sarà il numero di alternative tra cui si è indecisi e quanto minore è la penalità attribuita alle risposte errate. Il numero delle alternative tra cui si è indecisi non coincide necessariamente con quello delle alternative esistenti. Se, per esempio, le alternative proposte sono 5, ma si riesce a sempre a scartarne una perché si sa che è errata, il numero da considerare per il confronto con la penalizzazione è 4 (cioè $5 - 1$).

In questo circostanza rispondendo a caso si si risponderebbe in modo corretto a 15 esercizi (60/4) e si sbaglierebbero i restanti 45 quesiti:

- Risposte esatte: $15 \times (+1,5) = +22,5$
- Risposte errate: $45 \times (-0,4) = -18$
- Risposte nulle: $0 \times 0 = 0$
- Punteggio totale: $22,5 - 18 = +4,5$

Quindi, con le regole in uso nel 2015, è sufficiente scartare almeno una alternativa per rendere statisticamente conveniente rispondere a caso al quesito.

Scheda per le risposte e correzioni

Una volta individuata la risposta corretta a un quesito, il candidato deve segnare su un'apposita *scheda per le risposte* (si veda l'esempio riportato nella pagina seguente), distinta dal fascicolo contenente gli esercizi. Si tratta cioè di segnare la risposta esatta in corrispondenza del numero dell'esercizio appena risolto.

Per la correzione delle schede vengono utilizzati *elaboratori elettronici* dotati di *lettori ottici*, il candidato deve quindi rispondere contrassegnando in modo opportuno lo spazio (un "cerchietto" o "quadratin"o) corrispondente all'alternativa ritenuta esatta.

Nelle prove per l'accesso a Medicina, Odontoiatria e Veterinaria degli ultimi anni era consentito effettuare correzioni sulla scheda delle risposte. È comunque consigliabile **limitare al minimo le correzioni**.

Sia la scheda sia il metodo di correzione potrebbero cambiare in futuro ed è quindi importante leggere e seguire attentamente le istruzioni e le procedure di svolgimento della prova. Sulle schede per le risposte sono solitamente presenti aree (con cerchi neri, codici a barre o altro) indispensabili al corretto funzionamento del sistema ottico di lettura e correzione. All'interno di tali aree è importante non apporre alcun segno di scrittura che potrebbe pregiudicare il corretto funzionamento del lettore.



Si raccomanda quindi di non apporre alcun segno al di fuori delle caselle previste e di non sgualcire o piegare la scheda.



M.I.U.R. — Ministero dell'Istruzione, dell'Università e della Ricerca

Modulo risposte

ATTENZIONE: NON piegare o sguaiare questa scheda



Cultura generale e ragionamento logico						Biologia						Chimica						Matematica e Fisica					
N° domanda						N° domanda						N° domanda						N° domanda					
A	B	C	D	E		A	B	C	D	E		A	B	C	D	E		A	B	C	D	E	
☐ 1	☐	☐	☐	☐	☐	☐ 23	☐	☐	☐	☐	☐	☐ 41	☐	☐	☐	☐	☐	☐ 53	☐	☐	☐	☐	☐
☐ 2	☐	☐	☐	☐	☐	☐ 24	☐	☐	☐	☐	☐	☐ 42	☐	☐	☐	☐	☐	☐ 54	☐	☐	☐	☐	☐
☐ 3	☐	☐	☐	☐	☐	☐ 25	☐	☐	☐	☐	☐	☐ 43	☐	☐	☐	☐	☐	☐ 55	☐	☐	☐	☐	☐
☐ 4	☐	☐	☐	☐	☐	☐ 26	☐	☐	☐	☐	☐	☐ 44	☐	☐	☐	☐	☐	☐ 56	☐	☐	☐	☐	☐
☐ 5	☐	☐	☐	☐	☐	☐ 27	☐	☐	☐	☐	☐	☐ 45	☐	☐	☐	☐	☐	☐ 57	☐	☐	☐	☐	☐
☐ 6	☐	☐	☐	☐	☐	☐ 28	☐	☐	☐	☐	☐	☐ 46	☐	☐	☐	☐	☐	☐ 58	☐	☐	☐	☐	☐
☐ 7	☐	☐	☐	☐	☐	☐ 29	☐	☐	☐	☐	☐	☐ 47	☐	☐	☐	☐	☐	☐ 59	☐	☐	☐	☐	☐
☐ 8	☐	☐	☐	☐	☐	☐ 30	☐	☐	☐	☐	☐	☐ 48	☐	☐	☐	☐	☐	☐ 60	☐	☐	☐	☐	☐
☐ 9	☐	☐	☐	☐	☐	☐ 31	☐	☐	☐	☐	☐	☐ 49	☐	☐	☐	☐	☐						
☐ 10	☐	☐	☐	☐	☐	☐ 32	☐	☐	☐	☐	☐	☐ 50	☐	☐	☐	☐	☐						
☐ 11	☐	☐	☐	☐	☐	☐ 33	☐	☐	☐	☐	☐	☐ 51	☐	☐	☐	☐	☐						
☐ 12	☐	☐	☐	☐	☐	☐ 34	☐	☐	☐	☐	☐	☐ 52	☐	☐	☐	☐	☐						
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☐ 22	☐	☐	☐	☐	☐																		

1. Ogni domanda ammette **una e una sola** risposta esatta. Si risponde barrando la relativa casella, ad esempio con una crocetta ben marcata, avendo cura di rimanere entro i bordi della casella stessa.

☐ 1 ☒ ☐ ☐ ☐ ☐

2. Per correggere una risposta errata è necessario **annerire completamente** la casella e barrare quella corretta. Per ogni domanda **è ammessa una sola** correzione.

☐ 2 ☒ ☐ ☐ ☐ ☒

3. Se si intende annullare una risposta già data o non rispondere a una domanda occorre annerire la casella circolare a sinistra del numero progressivo.

☒ 3 ☒ ☐ ☐ ☐ ☒

☒ 4 ☐ ☐ ☐ ☐ ☐

Esempio di scheda delle risposte con possibilità di correzione ed estratto di istruzioni per la corretta compilazione della scheda.

parte prima

RAGIONAMENTO LOGICO

IRANINOVIN

Quesiti

- 1 Many countries compel their citizens to carry identity (ID) cards and many other countries are introducing them. One reason in favour of ID cards is that they can assist with law enforcement. However, the opposite argument is more likely to be the case. A consequence of providing a one-stop form of identity check is that it can encourage identity thefts. The more an ID card needs to be used, the greater its value to criminals. This is a persuasive reason for not introducing ID cards.

Which one of the following is an underlying assumption of the above argument?

- A Most countries will introduce ID cards.
- B ID cards cannot be made secure and unfalsifiable.
- C ID cards cannot be falsified or counterfeited.
- D ID cards will be used to gain entry to all public examinations.
- E Criminals are in favour of the introduction of ID cards.

- 2 A 15 km wide asteroid smashing a 150 km wide crater into part of what is now Mexico is the best explanation for the extinction of the dinosaurs 65 million years ago. Previously, some experts believed that while there was no volcanic activity around the asteroid's impact site, a series of super volcanic eruptions over 1.5 million years, in what is now India, was responsible. However, the evidence shows that the fossil record ends too abruptly for a long period of volcanic activity to be the cause. Mathematical modelling also demonstrates that the impact of the asteroid would have created a dust cloud sufficient to kill off the dinosaurs within a couple of years and to leave the layer of deposits found just above those containing the last fossil remnants of the dinosaurs.

Which one of the following, if true, most weakens the above argument?

- A The impact of the asteroid would have been a million times the force of an atomic bomb.
- B The long series of volcanic eruptions in India would have produced as much dust as the impact of the asteroid.
- C Huge craters can be created by immense volcanic eruptions as well as the impact of asteroids.
- D Detailed analysis of the fossil records shows that dinosaur numbers were already in serious decline before they died out 65 million years ago.
- E Large asteroids smash into the earth on average only once every 100 million years.

- 3 There are two services between Sandpoint and Genville: a fast hovercraft service which takes 50 minutes and a slow ferry which takes 1 hour 40 minutes. They both stop in port for 20 minutes at each end before starting the return journey. They start out from Sandpoint together at the same time each morning.

For how long has the slow ferry been sailing before it meets the hovercraft coming back? (Answer to the nearest minute if necessary.)

- A 1 hour and 10 minutes
- B 1 hour and 20 minutes
- C 1 hour and 7 minutes
- D 1 hour and 25 minutes
- E 1 hour and 30 minutes

Look at the following tables and graphs and answer the questions.

Table 1: Imports/exports trend of Force S.p.A.

Year	Exports (millions of dollars)	Imports (millions of dollars)
2007	1,000	300,000
2008	1,200	300,000
2009	1,500	200,000
2010	1,000	300,000

Graph 1: Wheat production distribution among France, Germany and Italy in 2010

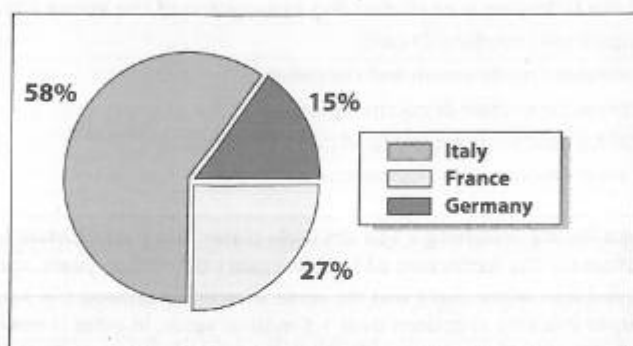


Table 2: Graduates employed according to the job

Self-employed	% of graduate people employed	Employed	% of graduate people employed
Entrepreneur Lawyers, doctors, engineers etc.	28,9%	Manager	1,4%
Own venture	1,2%	Teacher	14,0%
Other	5,7%	Executive Official	9,2%
		Civil servant	31,1%
		Other	8,4%
Total	35,9%	Total	64,1%

Table 3: Comparison between two companies: Pala and Manca

Company	Turnover (millions of dollars)	Employed people	Ratio exports/ 2010's turnover	Ratio Imports/ 2010's turnover
Pala	6,500	24	8%	12%
Manca	10,200	52	14%	2%

- 4 The amount of employed people in the public sector is:
 A about 500 people
 B about 1,500 people
 C about 14,000 people
 D about 31,000 people
 E no estimate can be done
- 5 As 2010's wheat production in France was 1,350 tons, 2010's wheat production in Germany was:
 A 500 tons
 B 600 tons
 C 650 tons
 D 750 tons
 E 1,000 tons
- 6 In comparison with Pala's and Manca's exports in 2010, Force S.p.A.'s exports in the same year were:
 A more than Pala's and fewer than Manca's
 B more than Manca's and fewer than Pala's
 C fewer than Manca's and Pala's
 D more than Manca's and Pala's
 E no comparison can be done
- 7 Twelve people are either studying or working or doing both. If nine people are studying and seven people are working, how many people are both studying and working at the same time?
 A 12
 B 7
 C 3
 D 2
 E 4
- 8 Sarah has got some cats. They are half as many as Allyson's dogs. Kate's cats are half as many as her dogs. Kate's dogs are one third of Allyson's dogs. The dogs are 16 altogether. How many cats do Sarah and Kate have altogether?
 A 2
 B 6
 C 8
 D 10
 E 15
- 9 Francesco can build a wall in 6 hours, and Gianni can build the same wall in 4 hours. Francesco starts the job at 9 a.m., and stops working at 12 a.m. If Gianni starts working at 1 p.m. to complete the wall, at what time is the job finished?
 A 7 p.m.
 B 4 p.m.
 C 3 p.m.
 D 10 p.m.
 E 12 p.m.

Read the following passage and answer the given question.

Boss, Weather, Spoon, River and Eye are film production companies. Each of them produces one of the following films: thriller, sentimental story, detective story, comedy and dramatic story (not necessarily in that order). They last 2 hours, 1.45 hours, 1.30 hours, 1.15 hours and 1 hour (not necessarily in that order). Further information:

- Spoon produced the dramatic story;
- the comedy is the longest film;
- the film produced by River lasts more than the thriller only;
- the sentimental film produced by Boss lasts 1 hour and 30 minutes.

10 According to the information given, the detective story:

- A** lasts 1 hour and 45 minutes
- B** was produced by Eye
- C** lasts 1 hour and 15 minutes
- D** was produced by Weather
- E** lasts 1 hour

11 According to the information given, which of the following is wrong?

- A** The dramatic story lasts 1 hour and 45 minutes
- B** Maybe the comedy was produced by Eye
- C** The detective story was produced by River
- D** The thriller lasts more than the sentimental film
- E** Only one of the previous statements is false

12 Which further information could help you find out who produced the thriller?

- A** No further information is needed. The information given in the passage is sufficient to find the answer
- B** The thriller doesn't last 1 hour and 45 minutes
- C** Eye didn't produce the longest film
- D** Weather didn't produce the film that lasts 1 hour and 45 minutes
- E** Spoon produced the longest film

13 Mark has three cards: one has two white sides, one has two blue sides, and one has one white side and one blue side. He puts them in a bag, draws one at random then puts it on the table. If its front side is blue, what is the probability that its back side is blue too?

- A** $\frac{1}{4}$
- B** $\frac{2}{3}$
- C** $\frac{1}{3}$
- D** $\frac{1}{2}$
- E** $\frac{1}{8}$

14 If a bookshop loyalty discount card costs 60 dollars and the connected discount is 12%, how many books will a shopper need to buy in order to cover the cost of the loyalty card, considering that the averaged book price is 20 dollars?

- A** 50
- B** 25
- C** 500
- D** 15
- E** 120

- 15 Deanna keeps a record of the petrol she puts into her car and the current distance it has covered so she can estimate her fuel consumption. When she puts petrol in, sometimes the tank is filled completely and she marks 'FULL' beside the entry if this is so, otherwise the tank is only partly filled.

Her data for the last month is as follows:

Date	Total km	Fuel added	FULL?
2 June	23,508	5 litres	
6 June	23,805	37 litres	FULL
12 June	24,350	25 litres	
17 June	24,743	21 litres	
23 June	24,989	34 litres	FULL
27 June	25,454	18 litres	

Which one of the following is the best estimate of her fuel consumption?

- A 1.7 litres / 100 km
- B 7.7 litres / 100 km
- C 6.8 litres / 100 km
- D 8.0 litres / 100 km
- E 9.9 litres / 100 km

Read the following passage and answer the given question.

In physiology, respiration (often confused with breathing) is defined as the transport of oxygen from the outside air to the cells within tissues, and the transport of carbon dioxide in the opposite direction. This is in contrast to the biochemical definition of respiration, which refers to the cellular one, that is to say the metabolic process by which an organism obtains energy by making oxygen react with glucose to give water, carbon dioxide and ATP (energy). Although physiologic respiration is necessary to sustain cellular respiration and thus life, in animals the processes are distinct: cellular respiration takes place in individual cells of the organism, while physiologic respiration concerns the bulk flow and transport of metabolites between the organism and the external environment.

- 16 Which of the following can be inferred from the passage?

- A Breathing and respiration are synonyms
- B The biochemical definition of respiration is the transport of oxygen from the outside air to the cells within tissues, and the transport of carbon dioxide in the opposite direction
- C The production of energy is a result of the cellular respiration
- D There is no relation between physiologic and cellular respirations
- E In the physiologic respiration carbon dioxide comes from the outside air into the cells within tissues

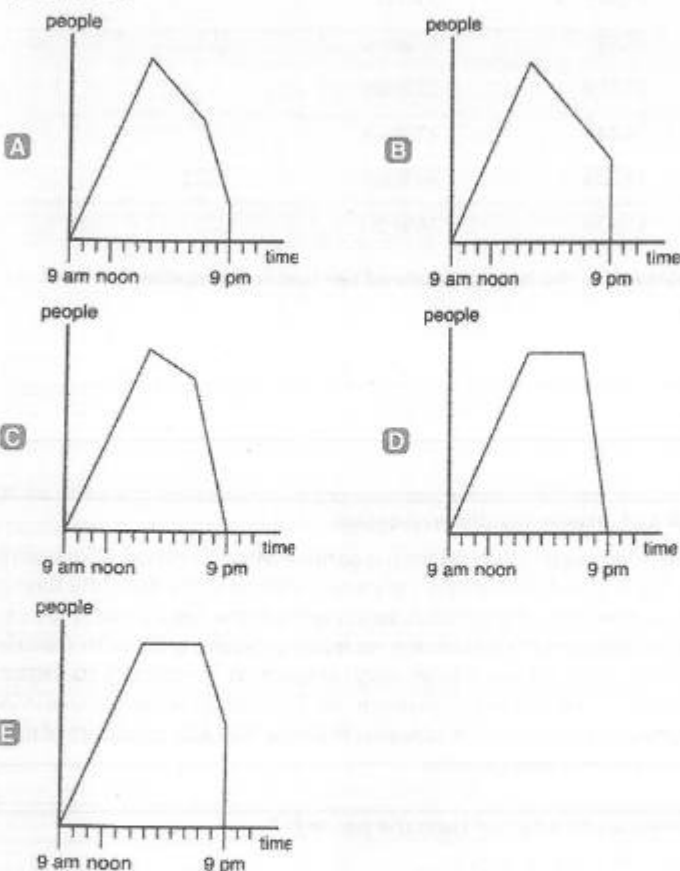
- 17 Physiologic and cellular respirations differ:

- A only in terms of environment where they take place
- B only in terms of metabolic products they result in
- C only in terms of processes involved
- D only in terms of transport of metabolites
- E all of the previous terms are correct

- 18 A survey was carried out of people entering and leaving a particular theme park during one day in late summer.

People entered at a steady rate of 600 per hour from opening time at 9 am until 7 pm, when the entrance gates were closed. Nobody left until 3 pm, from which time people came out at a steady rate of 15 per minute until 9 pm. At 9 pm the park closed and all remaining visitors had to leave.

Which one of these graphs best represents the number of people inside the park as the day progressed?



Read the following passage and answer the given question.

Many researchers believe that child neglect, or a failure to provide for some basic need of a child, is one of the most common forms of child abuse. Although society has advanced in many ways in addressing child abuse, neglect, which is related to the care of children, has not been an area that has kept pace with those advances.

- 19 According to the information given say which of the following statements is true.

- (A) Neglect is a widespread form of child abuse
- (B) Neglect has recently been considered a form of child abuse
- (C) Social advances in addressing child abuse are unquestionable
- (D) Social advances in addressing child abuse date back to the last decade
- (E) Society has recently understood what child abuse is

Read the following passage and answer the given question.

At his final rally, Barack Obama stood before 20,000 adoring Iowans, just yards from the Des Moines headquarters where his 2008 Children's Crusade began. Something happened. Something we have rarely seen: Obama wept. A few elegant tears slowly descended from his left eye, perhaps in appreciation of the enormity and the improbability of what he was about to accomplish. Within 24 hours those tears had turned into dancing. The re-elected president was more exuberant, more idealistic, even, than the sober, sober young president-elect of Grant Park 2008. And for good reason.

- 20 According to the passage, it can be inferred that:**
- A** Obama started his campaign in 2008
 - B** Obama has been elected for the third time
 - C** Obama wept as soon as he became aware of his re-election
 - D** Obama was in Iowa just before his re-election
 - E** Obama's re-election was certain
- 21 What made Obama's tears turn into dancing?**
- A** 20,000 adoring Iowans
 - B** Obama's love for his wife Michelle
 - C** The music by Bruce Springsteen
 - D** Obama's re-election
 - E** The memory of Grant Park 2008
- 22 It usually takes John 20 minutes to get to work, driving at an average speed of 15 mph. One morning he leaves home 5 minutes later than usual. Which average speed is he requested to drive in order to get to work at his usual time?**
- A** 25 mph
 - B** 25 min.
 - C** 30 mph
 - D** 12 mph
 - E** 20 mph

Read the following passage and answer the given question.

The Nobel Prize in Literature for 2012 is awarded to the Chinese writer Mo Yan "who with hallucinatory realism merges folk tales, history and the contemporary". The novel *Tiantang suantai zhi ge* (1988, in English *The Garlic Ballads* 1995) and his satirical *Jiuguo* (1992, in English *The Republic of Wine* 2000) have been judged subversive because of their sharp criticism of contemporary Chinese society. Through a mixture of fantasy and reality, historical and social perspectives, Mo Yan has created a world reminiscent in its complexity of those in the writings of William Faulkner and Gabriel García Márquez, at the same time finding a departure point in old Chinese literature and in oral tradition. In addition to his novels, Mo Yan has published many short stories and essays on various topics, and despite his social criticism is seen in his homeland as one of the foremost contemporary authors.

- 23 According to the information given in the passage what is peculiar of Mo Yan's work?**
- A** His criticism of Chinese society
 - B** His despising Chinese oral tradition
 - C** His crude realism
 - D** His predilection for fantasy
 - E** His versatility as a writer

Read the following passage and answer the given questions.

Early Wednesday morning, Barack Obama appeared before thousands of cheering supporters in Chicago and for the first time in a long time sounded like a president. The victory speech lingered on a little too long, but hey - after an all-but-miraculous reelection, I'll cut him a little slack. Overall, the tone was gracious, elevated, inclusive, and deeply patriotic. One hopes it is a positive omen for his next four years. Take it from a retired presidential speech-writer: political speeches, as a general rule, are vastly overrated. This is mostly because politicians give too many of them. They've become dull and formulaic and have lost most of their impact. There were, however, a few moments in the 2012 campaign where the politicians did manage to tell us something - even if it wasn't always what they intended.

- 24 Which of the following can be inferred from the passage?**
- A** The author of the passage used to be a presidential speech-writer
 - B** In the 2012 campaign politicians were really effective and incisive
 - C** During his victory speech Barack Obama acquired a bit arrogant tone
 - D** Barack Obama will be the USA president for the next five years
 - E** Barack Obama's victory speech took place in California

- 25 The victory speech of Barack Obama:**
- A** was pronounced in the evening
 - B** could not be more concise
 - C** can be easily overrated
 - D** was pronounced together with Michelle Obama
 - E** None of the previous answers is correct

Read the following passage and answer the given questions.

Muscle fiber generates tension through the action of actin and myosin cross-bridge cycling. While under tension, the muscle may lengthen, shorten, or remain the same. Although the term contraction implies shortening, when referring to the muscular system, it means muscle fibers generate tension with the help of motor neurons. For voluntary muscles, all contraction (excluding reflexes) occurs as a result of conscious effort originating in the brain. The brain sends signals, in the form of action potentials, through the nervous system to the motor neuron that innervates several muscle fibers. In the case of some reflexes, the signal to contract can originate in the spinal cord through a feedback loop with the grey matter. Involuntary muscles such as the heart or smooth muscles in the gut and vascular system contract as a result of non-conscious brain activity or stimuli endogenous to the muscle itself. Other actions such as locomotion, breathing, and chewing have a reflex aspect to them: the contractions can be initiated consciously or unconsciously.

- 26 What can be inferred from the passage?**
- A** Referring to the muscle, the term contraction doesn't imply shortening
 - B** The signal to contract a muscle always originates from the brain
 - C** The stimulus to contract a muscle cannot originate inside the muscle itself
 - D** Some muscular actions can be both conscious and unconscious
 - E** The brain is not always involved in muscular contractions
- 27 Which one of the following sentences can best express the subject of the passage?**
- A** Scientific progress in the muscle physiology
 - B** The role played by the spinal cord in the muscle contraction
 - C** Physiology of muscle contraction
 - D** Consciousness in locomotion, breathing and chewing contraction
 - E** Diseases in muscle contraction

- 28 The footpath through Thiska Park is 1,260 m long.
There are a number of litter bins along the path: one at each end, with the others situated at equal distances in between.
The Park Authority has today decided that three new bins should be introduced and the others repositioned (except those at each end) so that they all remain equal distances apart. When this happens the bins will be 35 m closer together than they are at present.
How many litter bins are there at present along the footpath through Thiska Park?
- A 9
 - B 12
 - C 13
 - D 8
 - E 10

- 29 Now, it might be thought an amazing coincidence if Earth were the only planet in the galaxy on which intelligent life evolved. If it happened here, the one planet we have studied closely, surely one would expect it to have happened on a lot of other planets in the galaxy – planets we have not yet had the chance to examine. This objection, however, rests on a fallacy: it overlooks what is known as an 'observation selection effect', so it wouldn't be such a coincidence. Whether intelligent life is common or rare, every observer is guaranteed to originate from a place where intelligent life did, in fact, arise. Since only the successes give rise to observers who can wonder about their existence, it would be a mistake to regard our planet as a randomly selected sample from all planets.

Which one of the following best expresses the main conclusion of the above argument?

- A If life had evolved here on Earth, it would probably have happened on a lot of other planets in the galaxy.
- B It would be an amazing coincidence if Earth were the only planet in the galaxy on which intelligent life evolved.
- C There would be no amazing coincidence if we discovered that Earth were the only planet in the galaxy on which intelligent life evolved.
- D Our planet is not a randomly selected sample from all planets.
- E However common intelligent life is, every observer will certainly originate from a place where intelligent life did, in fact, arise.

- 30 In future, people are going to need to work beyond the current retirement age because pensions are not holding their value. Therefore, it is going to be more difficult for young people to find employment.

Which one of the following, if true, would weaken the above argument?

- A Employers prefer to take on younger staff as they are less expensive.
- B Young people have not developed the skill sets that older people have.
- C Many young people go to university simply because they cannot find jobs.
- D Research has shown that people who work longer generally stay healthier.
- E In a recession there are likely to be fewer jobs in total.

- 31 An insurer can sell 12 new policies a week. How long does it take him to sell 84 policies?

- A 5 weeks
- B 8 weeks
- C 7 weeks
- D 1 month
- E 32 days

- 32 In a furniture shop Daniel buys a kitchen, a sofa, a mattress and a carpet and spends 1,800 Euros in all. The sofa costs two third of the price of the kitchen. The carpet costs one third of the price of the mattress and the mattress costs one fourth of the price of the kitchen. How much is the mattress?

A 480 Euros
B 600 Euros
C 225 Euros
D 180 Euros
E 260 Euros

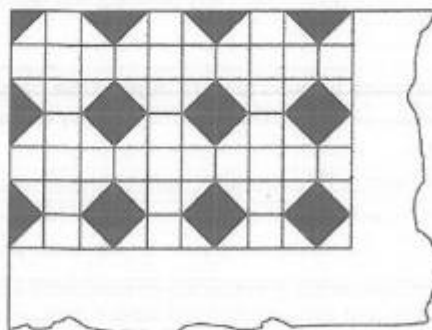
- 33 Climate scientists in Greenland studying patterns of plant growth have suggested that the early arrival of spring in the Arctic threatens to drive down populations of migrating animals such as caribou. However, comparable studies elsewhere show that their fears are unfounded. A recent study of great tits in Oxfordshire showed the birds are capable of adapting to climate change better than many scientists expected. Over the past half century, the birds have brought forward the date they lay their eggs by two weeks, so that young are born when plant-eating grubs are most plentiful.

Which one of the following is an underlying assumption of the above argument?

A Birds are more adaptable than large mammals such as caribou.
B Migrating animals in the Arctic can adapt to climate change as successfully as great tits in Oxfordshire.
C Climate change in Greenland and climate change in Oxfordshire are of the same scale.
D The scientists working in Oxfordshire have greater expertise than those working in Greenland.
E Unless animals like the caribou produce their young earlier in the year, their population will fall.

- 34 The rectangular floor of my conservatory is 4.2 m long and 2.4 m wide. I am in the process of covering it with 20 cm by 20 cm square tiles (cut diagonally into two pieces where required), producing a repeating pattern.

This diagram shows my progress so far:



Including those already laid, how many black tiles do I need altogether to produce this pattern?

A 56
B 28
C 63
D 36
E 72

Read the following passage and answer the given questions.

By the late 1920s to early 1930s pathology was deemed a medical specialty. During the years following, the decision to split pathology into sub-specialties arose. Today, anatomical, clinical, molecular, plant, forensic, oral, veterinary, dermatopathology, hematopathology, and pathology exist as medical specialties. Today, pathologists are discovering new diseases, examining exotic diseases that enter the country, and working on a solution to cure diseases such as AIDS, HIV, Herpes, cancer, and more. Thus the evolution of pathology is evidence of the real value of science, which lies in its ability to continually research and develop new methods while giving credit to those who originally developed the idea.

35 The passage is focused on:

- A** clinical pathology
- B** new diseases recently discovered
- C** the history of pathology
- D** medical research
- E** new research method in pathology

36 Which of the following can be inferred from the passage?

- A** In the coming future new treatments will be discovered to cure diseases like AIDS, Herpes and cancer
- B** Today clinical pathology is more important than dermatopathology
- C** The history of pathology is connected to the value of science
- D** Before 1920 pathology was not a medical specialty
- E** None of the previous answers is correct

37 Find the synonym of the word given.

Core

- A** Important
- B** Centre
- C** Basis
- D** Growth
- E** Care

38 Peter, Charles and Richard play clay pigeon shooting. Peter shoots at his targets and breaks 1 out of 4. Charles breaks 2 out of 3 and Richard 1 out of 3. What is the probability that at least one of them breaks the target when shooting at the same time?

- A** 5/6
- B** 1/6
- C** 1/2
- D** 4/5
- E** 3/5

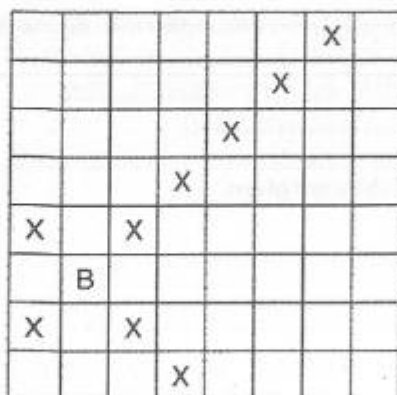
39 Three friends are 58 years old altogether. Annie, the eldest, is twice as old as Jennie. Maggie is two years younger than Jennie. How old is Maggie, the youngest friend?

- A** 21
- B** 19
- C** 17
- D** 13
- E** 9

- 40 The existence of so many conflicts in the world might tempt us to conclude that the world will always be violent. But there is evidence that human society is becoming less violent. Death rates in recent wars are proportionally far below those typical in tribal killing. The wars of the twentieth century, including both world wars, did not kill anything like that proportion of adults. Moreover, the motivation to behave aggressively is decreasing: as the world becomes increasingly interconnected we have more to lose by attacking our enemies. World peace is a distant prospect but we seem to be moving in a more peaceful direction.

Which one of the following, if true, would most weaken the argument in the passage above?

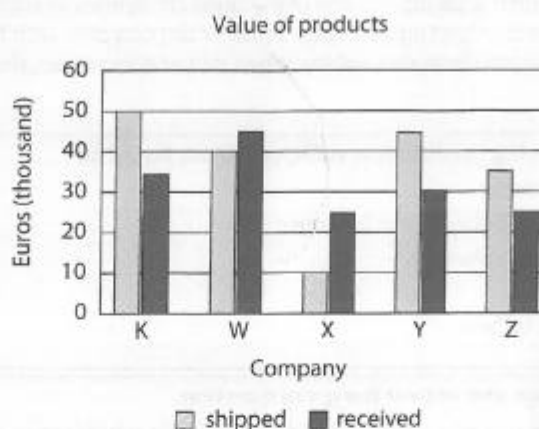
- (A) The two world wars of the twentieth century led to significant peace initiatives.
 (B) Advances in medical care have enabled more servicemen to survive injuries in war.
 (C) Old rivalries between the world superpowers are lessening.
 (D) Globalisation tends to lead to political as well as economic co-operation.
 (E) Tribal societies had economies that fostered raiding and aggressive self-protection.
- 41 Chess is played on an 8 by 8 board of squares. A bishop standing on any square can be moved any distance along a diagonal: for example, the bishop at B in the diagram can move to any of the squares marked X, so nine possible moves are open to him.



How many moves are open to him if he stands on a square which gives him the fewest possible moves?

- (A) 6
 (B) 8
 (C) 7
 (D) 9
 (E) 13
- 42 Find the missing number:
- 4, 8, 10, 20, 22, 44, 46, ?
- (A) 56
 (B) 48
 (C) 23
 (D) 64
 (E) 92

Look at the following graph and answer the questions.



- 43 How many companies have received over 30,000 Euros worth of products, while they have shipped fewer than 20,000 Euros worth of products?

A 0
B 1
C 2
D 3
E 4

- 44 How many companies shipped less than they received?

A 1
B 2
C 3
D 4
E 5

- 45 Whose ratio of shipped to received equals $\frac{2}{5}$?

A Company K
B Company W
C Company X
D Company Y
E Company Z

- 46 Find the missing number:

91, 87, 83, 79, 75, ?

A 69
B 61
C 62
D 74
E 71

Read the following passage and answer the given question.

Turning air into liquid may offer a solution to one of the great challenges in engineering - how to store energy. The Institution of Mechanical Engineers says liquid air can compete with batteries and hydrogen to store excess energy generated from renewables. When demand increases, the air can be warmed to drive a turbine.

47 Which of the following conditions is sufficient to use liquid air?

- A** The demand increase
- B** The elimination of batteries and hydrogen
- C** The utilization of renewables
- D** Energy storing
- E** The driving of a turbine

Read the following passage and answer the given question.

The flight for Prague leaves two hours after the flight for Brussels, which leaves half an hour before the flight for Paris and one hour after the midday flight for Lisbon. The flight for Prague lasts 1 hour and 30 minutes, the one for Brussels lasts 1 hour, the one for Paris lasts 45 minutes and the one for Lisbon lasts 2 hours.

48 According to the information given, the flight for:

- A** Paris leaves at 2.30pm
- B** Prague leaves at 3pm
- C** Brussels leaves at 2pm
- D** Lisbon is the last to leave
- E** Paris leaves after the flight for Prague

49 According to the information given, what happens at 2pm?

- A** The flight for Prague leaves
- B** The flight for Lisbon will land at destination after one hour
- C** The flight for Paris lands at destination
- D** Both the flight for Lisbon and the flight for Brussels land at destination
- E** No one of the flights already left lands at destination

Read the following passage and answer the given question.

It is a claim that could put a dent in the green credentials of vegetarians: meat-free diets can be bad for the planet. Environmental activists and vegetarians have long taken pleasure in telling those who enjoy a steak that livestock farming is a major source of harmful greenhouse gases. But research has shown that giving up meat may not be as green as it seems. The Cranfield University study found that switching from British-bred beef and lamb to meat substitutes imported from abroad such as tofu and Quorn would increase the amount of land cultivated, raising the risk of forests being destroyed.

50 The passage provides information that helps to answer which of the following questions?

- A** Are meat-free diets healthy?
- B** Can importing meat substitutes be a risk for forests?
- C** Are vegetarians happier than meat eaters?
- D** Are researchers of Cranfield University vegetarians?
- E** Is tofu tastier than Quorn?

- 51 Psychologists have provided a dramatic demonstration of how childhood levels of self-control are linked with outcomes later in life. This is important because unlike other traits associated with life outcomes - such as cleverness, height and beauty - self-control tends to be amenable to improvement through training. Children with poor self-control were shown to be more likely in adulthood to have financial problems, health issues and criminal convictions, even when effects of intelligence and social class had been factored out. There would be measurable, long-term benefits to society as well as to individuals if programmes were provided to improve children's levels of self-control. Such programmes, however, would need to be universal to avoid the stigma of targeted intervention.

Which one of the following could be drawn as a conclusion from the passage?

- A Children with high levels of self-control tend to have more problems in adult life.
- B Schools should identify those children who need to improve their self-control.
- C Universal intervention programmes aimed at improving children's self-control should be considered.
- D Targeted intervention programmes tend to be unsuccessful.
- E The effects of poor self-control are more significant than the effects of low intelligence or social class.

- 52 Toys are big business. Many of our homes are filled with complex and elaborate toys, but do they really suit children's needs? Overly designed toys are often easily broken. Also, children can be discouraged from using their imagination by playing with toys that perform various functions like moving or talking. Many of these complicated toys can also be very age-specific. This suits manufacturers but means children can outgrow toys very quickly. Psychologists have also shown that simple toys provide children with more opportunities for learning and development than more complicated toys.

Which one of the following can be drawn as a conclusion from the passage above?

- A Modern toys are more suitable for today's children.
- B Toy manufacturers are interested only in generating profits.
- C Traditional toys are less interactive than modern toys.
- D Toys should never be age-specific.
- E Parents should buy simple toys for their children.

Read the following passage and answer the given question.

For many people in China, the mid-autumn festival and National Day holiday, falling within days of each other this year, means a week off work and a chance to spend time with friends and family. But for millions of China's migrant workers, this is a working week like any other. Many of them have young children back in their villages and do not see them for months or even years on end. One Beijing organization, the All China Women's Federation, estimates there are some 58m of these "left behind children".

- 53 What can be inferred from the passage?

- A If workers didn't have to migrate nobody would have to work during the National Day holiday
- B If workers didn't have to migrate there were no abandoned children
- C Workers migrate regardless of their families
- D 58 millions of migrant workers may not join their families for the National Day holiday
- E Some millions of migrant workers won't join their families for the National Day holiday

54 Mark has three children. If you choose two at random, you will always have one boy at least. How many daughters does Mark have?

- A 1
- B 2
- C 3
- D 0
- E None of the above

55 Undercover police investigators sometimes commit 'crimes' in order to convince the 'real criminals' that they are on the same side as them. Some of these activities have victims, although in the main these are other criminals – rival gang members for example. In committing what are technically offences the officers are preventing many more serious crimes by helping to convict and imprison dangerous criminals who might otherwise remain at liberty. But that is not really the point. A breach of the law is a breach of the law, whoever commits it and for whatever reason. Preventing a crime does not make it right to commit another crime.

Which one of the following is the general principle underlying the above argument?

- A Serious crime must be prevented by any reasonable means.
- B An act is criminal only if it is committed for criminal reasons.
- C The police have a duty to protect law-abiding citizens from violence.
- D There is no such thing as a victimless crime.
- E The end does not justify the means.

56 Fabrizio has five children: three daughters and two sons. He has got only two tickets for a concert so he puts five pieces of paper in a box to draw two names. What's the probability of drawing the two sons consecutively?

- A 20%
- B 10%
- C 5%
- D 2%
- E 0,5

Read the following passage and answer the given question.

For more than 16,000 years, the prehistoric paintings in France's famed Lascaux Cave survived in splendid isolation. Then, after the discovery of the cave by four French schoolboys in 1940, man returned to the scene. He brought with him a mysterious blight that threatened to obliterate in a few short years the magnificent red cows, free-floating horses and other majestic creatures drawn so long ago on the cavern walls by talented Cro-Magnon artists. Now the archaeological crisis has apparently passed and French scientists have successfully diagnosed the illness of the ancient art gallery.

57 According to the information given, say which of the following statements is FALSE.

- A The cave was painted by Cro-Magnon artists
- B The isolation of the cave lasted for several thousands of years
- C The cave was discovered by French archaeologists
- D The walls of Lascaux Cave are full of red creatures drawn in the prehistoric age
- E Lascaux Cave is in France

58 Fill in the blanks to complete the proportion.

_____ : bowel = _____ : backbone

- A Brain, kidney
- B Thyroid, lung
- C Intestine, vertebral column
- D Cerebral cortex, spine
- E Jaw, teeth

Read the following passage and answer the given question.

There is an ongoing discussion in this nation about school uniforms, whether or not they help with behaviour problems, and increase test scores. Middle School/Junior High is a time of maturing, physically, mentally, academically, and emotionally. Schools need to create an environment that encourages students individuality and motivate them to challenge themselves and inspire self confidence. I feel that school uniforms diminish creativity and self expression.

59 Which of the following is the best statement of the flaw in the above argument?

- A Personal creativity and self expression is not necessarily diminished by wearing a school uniform
- B School uniforms don't help maturing emotionally
- C Buying school uniforms may be expensive for families
- D Students always like wearing school uniforms
- E Wearing school uniforms helps increasing test scores

Read the following passage and answer the given question.

The Asian Development Bank (ADB) has cut its growth forecast for Asia for this year and next, as economic problems in Europe and the US hurt developing countries. "Deceleration in the region's two giants, the People's Republic of China and India, and in other major exporting economies is tempering earlier optimism," the ADB said. Manufacturing in China showed a contraction for the second month in a row, Japanese industrial companies have become more pessimistic on their prospects and South Korean exports have fallen.

60 What conclusion can you draw from the passage?

- A Asian economy wouldn't face recession if Europe's and the US's economies grew
- B Asian economy will recover from recession as soon as China and India improve their economic conditions
- C Optimism about Asian economy may influence manufacturing in China
- D The Asian Development Bank stated that its growth forecast for Asia was being influenced by Europe and the USA
- E India, China, Japan and South Korea will soon be facing a serious contraction in manufacturing

61 Fill in the blank to complete the proportion.

Plane : _____ = ship : sail

- A take off
- B land
- C leave
- D jump
- E aircraft

Find the diagram that represents the relationship among the three sets given in each exercise.



Diagram 1



Diagram 2

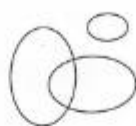


Diagram 3



Diagram 4



Diagram 5

62 **Books, writers, pencils.**

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

63 **Plastic objects, glasses, water.**

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

64 **Mothers, women, sons.**

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

65 **Animals, dogs, mammal.**

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

66 **Engineers, tall people, black-haired people.**

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

- 67 Looking in his rear-view mirror, Graham sensed that there was something wrong with the number plate of the car behind him. When the car overtook him and he saw its rear plate he realised that the front plate had been upside down.

S308 CNH

What had Graham seen in his rear-view mirror?

- A 2308 CNH
- B S308 CNH
- C S308 CNH
- D 2308 CNH
- E S308 CNH

- 68 Some recent research has shown that bees learn better early in the morning when their energy levels are highest. The process of memorising new odours from flowers is very energy-intensive, so carrying out the process of drawing nectar from flowers, which then helps the bee to remember the flower, is most effectively done early in the morning. Furthermore, most flowers accumulate their nectar during the morning, making this the optimum time for pollination. In this way the two species exhibit a mutually beneficial behaviour pattern.

Which one of the following could be drawn as a conclusion from the passage above?

- A Bees can remember the best nectar-producing flowers for long periods.
- B Bees and the flowers they pollinate have co-evolved which has optimised their chances of survival.
- C Bees have insufficient energy to memorise flower odours later in the day.
- D Bees are the only insects to successfully pollinate flowers.
- E Flowers that do not accumulate their nectar in the morning have no chance of being pollinated by bees.

Read the following passage and answer the given question.

Miriam runs faster than Geena, who runs faster than Florence only. Rachel runs faster than Jane and slower than Miriam only.

- 69 According to the information given, say which of the following statements is true.

- A Rachel runs the fastest
- B Jane runs faster than Geena
- C Florence doesn't run the slowest
- D Rachel runs faster than Miriam
- E Florence runs faster than Jane

70 Fill in the blank to complete the proportion.

Wool : cotton = polyester : _____

- A velvet
- B silk
- C nylon
- D sweater
- E wood

Read the following passage and answer the given question.

Three men (George, Paul and Victor) and three women (Eleanor, Lucy and Rose) go out to dinner. At the restaurant, they sit at a rectangular table: one person sits on each of the two head seats and two people sit on each of the longer sides of the table.

In addition:

- Eleanor has taken seat on one head seat and Paul is sitting at her right side;
- Lucy is sitting in front of Rose and Victor is sitting on a longer side at her right side.

71 According to the information given, George is sitting:

- A before Eleanor
- B at the right side of Rose
- C before Victor
- D at the left side of Eleanor
- E before Lucy

72 According to the information given, say which of the following statements is true.

- A Every woman is sitting before another woman
- B Every man is sitting between two women
- C Every man is sitting before a woman
- D The three women are sitting close to one another
- E The three men are sitting close to one another

Read the following passage and answer the given question.

A website is calling on citizen scientists to help researchers monitor and record Europe's bat population. The Bat Detective website needs people to help identify bat calls to help develop automated identification tools. The site converts normally inaudible bat calls into something humans can hear and provides information needed to help visitors identify species. Scientists say understanding bat populations provides an important indicator of ecosystem health.

73 Why are citizens called on to identify bat calls?

- A To test the new converter of inaudible sounds into sounds people can hear
- B To help researchers find new bat species and do scientific research
- C Researchers need to learn more about all the species
- D For a widespread monitoring of the bat population
- E To help people understand bat population better

74 Richard and Max made 450 cakes altogether. If Richard made 3.5 times as many cakes as Max made, how many cakes did Max make?

- A 100
- B 150
- C 250
- D 350
- E 400

- 75 Eight carpenters are working together at the same rate and can build a wardrobe in 3 hours. How long would it take them to build the same wardrobe if there were only 6 of them?
- A 5 hours
 - B 240 minutes
 - C 7 hours
 - D 360 minutes
 - E 115 minutes

Read the following passage and answer the given question.

America lacks the couture history of European nations, and, as a result, its fashion output has often been seen as more casual and less decadent, compared to collections from French and Italian design houses. That distinction was challenged in the fall of 1950, though, when designers unveiled clothing that had "taken on a quality of unmistakable elegance" which was also "unmistakably American," according to the Sept. 11, 1950 issue of LIFE.

- 76 Which one of the following identifies the flaw in this argument?
- A It assumes that less decadent means less elegant but luxurious is not always the same as elegant
 - B It ignores that most people prefer wearing casual clothes to wearing elegant clothes
 - C The American design houses have always been inspired by European collections
 - D French and Italian design houses are sometimes inspired by the American ones
 - E American designers still linger behind European designers

Read the following passage and answer the given question.

Scientists say they can find no convincing evidence to show that taking vitamin D supplements will fend off a cold. A New Zealand team did the "gold standard" of tests - a randomised placebo-controlled trial - to see what impact the supplements would have. The 161 people who took daily vitamin D for 18 months caught as many colds as the 161 who took fake pills. But a leading UK cold expert said vitamin D was useful. Prof Ronald Eccles, of the Common Cold Centre at Cardiff University, said it can give the immune system a much-needed boost during winter when vitamin D reserves may be low.

- 77 Which of the following are underlying assumptions of the above argument?
1. Scientists are still uncertain about the effects of vitamin D against colds.
 2. New Zealand and the UK agree on the results of the trials.
 3. Current vitamin D supplements are likely to prove ineffective against colds.
- A 1 only
 - B 1 and 2 only
 - C 1 and 3 only
 - D 2 and 3 only
 - E 1, 2 and 3

- 78 Find the missing number:

8, 16, 18, 36, 38, 76, 78, ?

- A 80
- B 156
- C 166
- D 132
- E 86

Read the following passage and answer the given question.

Smokers are being asked to give up smoking for 28 days from 1st October in the first mass quit attempt. "Stoptober", backed by Cancer Research UK and the British Heart Foundation, hopes a united effort will help many of England's eight million smokers to quit successfully. Research shows people who stop smoking for 28 days are five times more likely to stay smoke-free. It also shows mass movements and mass media campaigns can have a big impact.

79 The passage provides information that helps to answer which of the following questions?

- A** Can mass movements affect people's decisions?
- B** How many researchers have been involved in studying the effects of tobacco?
- C** How long does it take smokers to stop smoking?
- D** What are smokers from around the world going to do in October?
- E** Why are smokers being informed about the risks of smoking?

Read the following passage and answer the given question.

The concept of adolescence goes back to the 1900s and the American psychologist G. Stanley Hall, who argued that the biological changes associated with puberty drove problematic behaviour. He described it as a period of "storm and stress" when young people demanded freedom but needed discipline.

80 Which one of the following, if true, weakens this argument?

- A** Young people demand freedom even though they don't live in slavery
- B** Were there no biological changes during puberty, there wouldn't be any problematic behaviour
- C** The more problematic the teen-ager is, the more biological changes he or she is undergoing
- D** Discipline can't go without freedom
- E** Problematic behaviour cannot always depend on biological changes only

Read the following passage and answer the given question.

Women in the UK are dying unnecessarily of ovarian cancer because of a lack of access to the best treatment, say experts. The fifth most common cancer in UK women affects more than 6,500 a year. UK's record of managing advanced stages of the disease is particularly poor. Survival rates have been improving - more than two-thirds of women with this cancer survive more than a year now in England and Wales compared with fewer than half in the mid-70s. But they still lag behind other countries.

81 Which one of the following can be drawn as a conclusion from the above passage?

- A** Treatment of ovarian cancer in the UK has improved but still much needs to be done
- B** Treatment of advanced stages of ovarian cancer in the UK is as effective as in other countries
- C** The English National Health System is less efficient than the Scottish National Health System
- D** Most of the women dying of ovarian cancer in the UK are poor people
- E** Survival rates were better in the Seventies

82 30 employees must be designated to four branches - A, B, C, D - of a company so that all the branches have employees. Branch A can't have more than 3 workers. B is to have one more than C. What is the minimum number of employees that can be designated to D?

- A** 0
- B** 1
- C** 2
- D** 3
- E** 4

Read the passage and answer the following questions.

Eight chess players - Antony, Charles, Frank, Jack, Liam, Michael, Nick and Peter - meet for a single-elimination tournament. The first matches are held at four tables (numbered from 1 to 4). The first four winners meet as follows: table 1's winner plays with table 4's winner, table 2's winner plays with table 3's winner. The two winners will play the final match. In addition:

- **Michael won the first match at table 4;**
- **Frank defeated Charles at table 2 but lost the following match against Nick;**
- **Antony and Peter were eliminated after the first match but no one of them had played against Liam, who won the first match;**
- **the player who had defeated Jack at the first match played the final match and lost.**

83 According to the information given, who won the chess tournament?

- A** Nick
- B** Liam
- C** Jack
- D** Frank
- E** Michael

84 Which further information would help you find out who was Michael's first opponent?

- A** Charles didn't play against the one who would win the tournament
- B** Jack didn't play against the one who would win the tournament
- C** Frank is better than Michael
- D** Peter didn't play against the one who would win the tournament
- E** Liam lost the final match

Read the following passage and answer the given question.

The world needs to do more to prepare for the impact of a rapidly ageing population, the UN has warned - particularly in developing countries. Within 10 years the number of people aged over 60 will pass one billion, a report by the UN Population Fund said. The demographic shift will present huge challenges to countries' welfare, pension and healthcare systems. The UN agency also said more had to be done to tackle "abuse, neglect and violence against older persons".

85 Which one of the following is an underlying assumption of the above argument?

- A** Developing countries are the only to be concerned with ageing population
- B** Every single country in the world should find measures to cope with the population ageing
- C** The world is ready to face population ageing
- D** The developing countries called for the UN's intervention
- E** The population is ageing all over the world

86 The current ratio of fair-haired boys to dark-haired boys at a party is 2 to 5. If 12 additional fair-haired boys arrive, the new ratio of fair-haired boys to dark-haired boys would be 4 to 9. How many fair-haired boys are there at the party?

- A** 27
- B** 48
- C** 54
- D** 72
- E** 108

87 What is 3, if 5 is four?

- A Two
- B Five
- C Eight
- D Eleven
- E Twenty

88 Find the wrong word.

- A Usually
- B Beautiful
- C Tired
- D Destroyed
- E Ugly

Read the following passage and answer the given question.

A genetically modified cow that produces milk less likely to cause allergic reactions has been engineered by New Zealand scientists. Up to 3% of infants are allergic to cow's milk in their first year of life. The modified cow produced milk without beta-lactoglobulin - a whey protein to which some people are allergic. The study has been labelled a "milestone" by one scientist, but some campaign groups say it raises ethical concerns.

89 Which one of the following is an underlying assumption of the above argument?

- A It is impossible to avoid exposure to food allergens
- B A few people are allergic to some proteins in cow's milk
- C Genetically modified organisms raise ethical concerns
- D New Zealand scientists are worried about their children
- E New Zealand scientists are doing research to treat allergies

Read the following passage and answer the given question.

Karl Deisseroth has been conducting some extraordinary research. His technique, known as optogenetics, uses lights to switch specific neural pathways in the brain on or off. So far, he's shown that he can control the behaviour of mice via optical fibres implanted in the cortex. The possible applications for humans are stupendous. They could include cures for drug addiction and mental illness and a treatment for Parkinson's disease.

90 Which one of the following best expresses the conclusion of this argument?

- A It is impossible to control human behaviour
- B Human behaviour control may be possible
- C Optical fibres must be implanted in human brain to treat diseases and disorders
- D Parkinson's disease cannot be treated
- E Neural pathways in the brain are compromised by drug addiction

91 Fill in the blank to complete the proportion.

End : ____ = in : out

- A begin
- B now
- C duration
- D later
- E beginning

Read the following passage and answer the given question.

How much do you and your doctor know about the drugs you take? This account suggests "not enough". Says Goldacre: "Drugs are tested by the people who manufacture them, in poorly designed trials, on hopelessly small numbers of weird, unrepresentative patients, and analysed using techniques that are flawed by design, in such a way that they exaggerate the benefits of treatments. Unsurprisingly, these trials tend to produce results that favour the manufacturer. When trials throw up results that companies don't like, they are perfectly entitled to hide them from doctors and patients, so we only ever see a distorted picture of any drug's true effects."

- 92 Which is a sufficient condition for doctors and patients to know the real benefits of treatments?**
- A** The results of any trials should be made public to doctors and patients
 - B** Manufacturers should involve doctors and patients in drugs tests
 - C** Trials should be better designed
 - D** Manufacturers and doctors should work together
 - E** Patients should call for better information
- 93 Sports are played either as a means of getting exercise or as a competition with an opponent. Some sports, such as football, involve a large amount of running and some people are more motivated to run when it is part of a game. Other sports, such as pool, do not involve much physical activity and so it is unlikely that they would be played for the exercise. Which one of the following conclusions is best supported by the passage above?**
- A** People who play pool are more likely to be interested in the competition than those who play football.
 - B** Since the main reason for playing sports is to get exercise, pool should not be classified as a sport.
 - C** It is easier to exercise when it is as part of another activity, such as playing sport.
 - D** Football is a better sporting activity than pool.
 - E** There is no point in running as a hobby, since football is more fun.
- 94 A motorcyclist covers an uphill distance of 100 km at a speed of 30 km/h and then drives back downhill at a speed of 60 km/h. What is his average speed along the whole drive?**
- A** 40 km/h
 - B** 45 km/h
 - C** 35 km/h
 - D** 50 km/h
 - E** 60 km/h
- 95 Alessandro drove at an average speed of 100 km/h for the first 100 km of his trip and then at an average speed of 150 km/h for the remaining 100 km of his trip. What was Alessandro's average speed, in km/h, for the entire trip?**
- A** 70
 - B** 115
 - C** 120
 - D** 125
 - E** 100

- 96 Suppose that a democratically elected government suppressed the opinions of those who disagree with its policies only with the full support of the majority of its citizens. Even then, it has no right to do so. Such action is as bad when done in accordance with public opinion as in opposition to it. The particular evil of silencing disagreement is that it robs the human race; future as well as present generations. If the opinion is right, people are deprived of the opportunity to exchange truth for error. If the opinion is wrong, they lose the chance to see the truth more clearly by contrast with error.

Which one of the following best expresses the main conclusion of the above argument?

- (A) It is right for a democratically elected government to suppress the opinions of those who disagree with its policies because it is elected.
- (B) It is not right for a democratic government to suppress disagreement even with majority support.
- (C) It is not right for a democratically elected government to suppress disagreement, unless its action has the full support of the majority.
- (D) It is right for a democratically elected government to silence disagreement, but only if the opinions are obviously false.
- (E) A democratic government need not fear those who disagree with its policies, because it has the support of the majority.

Read the following passage and answer the given question.

Have you ever wondered what you look like to Amazon, Netflix and others? Here is the cold, hard truth: You are a very long row of numbers in a very, very large table. This row describes everything you've looked at, everything you've clicked on, and everything you've purchased on the site; the rest of the table represents the millions of other Amazon shoppers. Your row changes every time you enter the site, and it changes again with every action you take while you're there. That information in turn affects what you see on each page you visit and what e-mail and special offers you receive from the company.

- 97 Which of the following can reliably be inferred from the above passage?

- (A) Internet shoppers are well aware they are numbers to companies
- (B) The row of numbers changes according to the offers received
- (C) Any of those who navigate the Internet are turned into useful information
- (D) Any of those who navigate trading websites like Amazon are turned into useful information
- (E) E-mails from the companies contains long rows of numbers

- 98 Fill in the blank to complete the proportion.

Thick : ____ = sickness : health

- (A) thin
- (B) small
- (C) little
- (D) fat
- (E) big

- 99 Fill in the blank to complete the proportion.

Boat : ship = plane : ____

- (A) helicopter
- (B) aircraft
- (C) flight
- (D) fly
- (E) plain

- 100 Pauline is working for Alpha and has just been offered a job by Beta. She presently gets a net monthly pay of 1,250 Euros for 13 months. If she worked for Beta she would get a gross monthly pay of 1,400 Euros for 14 months and a net productivity bonus of 900 Euros per year. Gross pay means that it needs cutting by 20%. Which of the following statements is true?

A Alpha's offer is more convenient to Pauline
B Beta's offer is more convenient to Pauline
C The two net pays are exactly the same
D The information given doesn't allow to calculate the net pays
E The net pay offered by Beta - productivity bonus excluded - is more convenient than the net pay offered by Alpha

Read the following passage and answer the given question.

Most people would never equate downing a well-dressed salad or a fried chicken thigh with taking a joint of marijuana. But new research suggests that the comparison holds up, in at least one key respect. Certain foods can trick your brain into over-eating, by converting a constituent of vegetable oil into natural compounds called endocannabinoids, which heighten appetite. Many cannabis users will have experienced "getting the munchies"; now we know how something similar can affect non-cannabis users too.

- 101 Which one of the following can be drawn as a conclusion from the above passage?

A Anyone eating vegetable oil may be tricked into over-eating
B Cannabis consumption and specific oily foods can affect appetite in the same way
C Endocannabinoids may compromise your health
D Those who "get the munchies" are cannabis addicted
E Fried chicken is not the same as a well-dressed salad

- 102 Find the missing letters: f, g, f, g, d, e, h, i, h, i, d, e, j, k, j, ?, ?

A k, d
B d, j
C k, l
D k, e
E e, d

- 103 Six friends are working together at the same rate and can paint a house in two hours. How long would it take them to paint the same house if there were 8 of them?

A 1 hour
B 1 hour and 45 minutes
C 1 hour and a half
D 45 minutes
E 50 minutes

- 104 Find the missing number: 25, 24, 22, 19, 15, ?

A 14
B 12
C 10
D 6
E 4

- 105 In a police station policemen are to be matched to form some flying squads. Men are as many as women. $\frac{2}{3}$ of the policemen can speak English. Every flying squad must be made up of a man and a woman.

Say which of the following statements are true (T), possible (P) and impossible (I):

1. the woman in every flying squad can speak English, the man cannot;
2. the policemen are at least 6 in all;
3. the man in every flying squad can speak English, the woman cannot;
4. the man in every flying squad can speak English;
5. in one flying squad at least both the man and the woman can speak English;
6. in some flying squads neither the man nor the woman can speak English.

- A 1-P; 2-T; 3-P; 4-I; 5-T; 6-I
 B 1-I; 2-T; 3-I; 4-T; 5-P; 6-P
 C 1-I; 2-I; 3-T; 4-T; 5-P; 6-P
 D 1-I; 2-T; 3-I; 4-P; 5-P; 6-T
 E 1-I; 2-T; 3-I; 4-P; 5-T; 6-P

- 106 Fill in the blanks to complete the proportion.

_____ : from = to die : _____

- A To aim, of
 B To come, to
 C To suffer, from
 D To suffer, of
 E To go, from

- 107 Fill in the blank to complete the proportion.

To ask : to answer = to confirm : _____

- A to say
 B to deny
 C to neglect
 D to reject
 E to apply

- 108 Two rally cars compete in an oval circuit. They start together at the same point. Car B drives at an average speed of $\frac{3}{5}$ of car A's speed. How many laps does it take car A to lap car B three times?

- A 5
 B 6
 C 8
 D 10
 E 12

- 109 Michele's travel agency reduces the price of a 300-Euro trip by 20%, but later it raises it again by 20% of the sale price. What is the final price of the trip?

- A 240 Euros
 B 320 Euros
 C 300 Euros
 D 288 Euros
 E 260 Euros

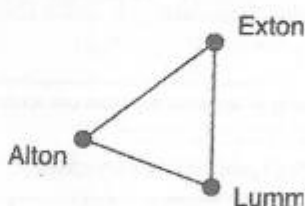
- 110 Concern about the effects of chemicals upon the environment has led to calls for more research. But we should not wait for further research before we ban some of the chemicals used by industry. If anyone has a good reason to think something is harmful, it should not be used until, or unless, the risk is found to be zero. We know enough about past mistakes to be forewarned. Much of the harm to wildlife and humans is long-term, and the disturbing results we see today reflect the chemical environment 40 years ago. Thousands more chemicals have been released into the environment since then.

Which one of the following most closely matches the reasoning above?

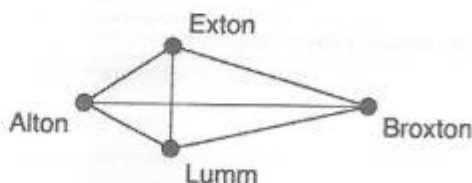
- A** People should not be able to adopt children until proper checks have been carried out. Serious consequences may follow if adoptive parents are unsuitable.
- B** A suspected terrorist should be arrested at once. Waiting for conclusive evidence in the past has resulted in atrocities that could have been avoided by acting on suspicion, and the threat of terrorism has grown.
- C** Some homes for the elderly have been found to give dangerously substandard care. Therefore they should be closed down and the residents found acceptable alternatives.
- D** Some cars that have passed the annual roadworthiness test would not pass 6 months later. Cars should be tested more than once a year once they pass a certain age.
- E** Cyclists should not place too much confidence in the benefits of helmets, because there is no conclusive evidence as yet that helmets prevent serious injuries.

- 111 My company has offices across the country. There is an inter-office communication system which links the offices directly with each other so that any two offices can communicate without involving a third.

When there were only three offices we had three links.



We opened a fourth office in Broxton and had to install three more links so that the new office could communicate with each of the existing offices.



Each time we open a new office new links are installed. Today we have six offices and next year we will open two further offices.

How many new links will be needed next year?

- A** 7
- B** 6
- C** 13
- D** 14
- E** 9

Read the following passage and answer the given question.

Common conditions affecting the heart.

Angina - an indication of heart disease

Aortic stenosis - can be present at birth but it's more common in older people

Arrhythmia - an abnormal heartbeat is common and not always dangerous

Atrial fibrillation - this is the most common cause of the heart beating irregularly Cardiomyopathy - where the structure of the heart muscle changes or weakens

Hardening of the arteries - often the result of high cholesterol

Heart attack - occurs when blood flow to part of the heart is blocked

High blood pressure - hypertension increases the risk of a heart attack

112 According to the information given, which of the following is hold responsible for the health of arteries?

- A** Aortic stenosis
- B** Cholesterol
- C** Heartbeat
- D** The heart muscle
- E** Hypertension

Read the following passage and answer the given question.

Some people crack their knuckles by pulling the tip of each finger one at a time until they hear a crack. Others make a tight fist or bend their fingers backwards away from the hand, cracking the lot at once. If you are one of those people who sits and cracks your knuckles while others wince, at some point somebody is bound to have told you that cracking your joints gives you arthritis. For some it's a nervous habit; for others the sensation brings relief. Depending on which research you read, between 25 and 54% of people do it, with men more likely to do so than women.

113 Which one of the following is an assumption on which this argument depends?

- A** Cracking knuckles is a widespread habit
- B** Between 25% and 54% of people crack knuckles
- C** Cracking knuckles is always a nervous habit
- D** Men are more nervous than women
- E** Cracking knuckles gives you arthritis

114 Fill in the blank to complete the proportion.

Up : down = before : _____

- A** behind
- B** late
- C** early
- D** front
- E** sometimes

115 Find the missing number: III, 10, XXIV, 45, LXXIII, 108, CL, ?

- A** 199
- B** 185
- C** 178
- D** 142
- E** 108

- 116 In a basket there are in all 31 blue and green socks. The blue socks are 15 and the green socks are 16. Find out the probability that Margherita draws a blue sock out of the basket.

A 15/31
B 16/31
C 1/15
D 1/31
E 31/15

Read the following passage and answer the given question.

Our eyes are cleverly designed to adjust to different light levels. If you are trying to read in the gloom your pupils dilate in order to take in more light through the lens onto your retinas. Cells in your retina, called rods and cones, use this light to provide information to the brain about what you can see. If you are in a dark room, for instance, when you just wake up, this process allows you to become gradually accustomed to what initially feels like pitch-black darkness. If you switch a light on, it feels unbearably bright until your pupils have had time to readjust once more.

- 117 Which one of the following is an assumption on which this argument depends?

A Sight is related to light
B Sight is related to space
C The brain receives information from the eyes
D The brain receives information according to space
E Lens are useful to take in more light

Read the following passage and answer the given question.

About one in every 50 people are affected by obsessive compulsive disorder (OCD) at some point in their lives, one million people in the UK. OCD usually starts in the teens or early twenties affecting men and women equally. The severity of symptoms vary over time, and include: recurring thoughts - 'obsessions' that make you anxious; repeating things you do over and over again - 'compulsions' that help you feel less anxious.

- 118 The passage provides information that helps to answer which of the following questions?

A What is the cause of anxiety?
B Are there any people affected by OCD late in life?
C What are compulsions caused by?
D Who is mostly affected by OCD?
E How is OCD treated?

Read the following passage and answer the given question.

In 1998, 71% of 16- to 24-year-olds questioned said they'd had a drink that week. Today it is 48% - far lower than their parents (about 70%). Among 11- to 15-year-olds there are similar big falls. A decade ago, 26% reported they'd had alcohol in the previous week. Now the data suggests the figure is 13%.

- 119 Which one of the following can be drawn as a conclusion from the above passage?

A Parents of today's teen-agers used to drink less alcohol in the past
B The number of 11- to 15-year-olds drinking alcohol has remained the same
C The number of 11- to 15-year-olds drinking alcohol has doubled
D The number of 16- to 24-year-olds drinking alcohol has decreased
E The number of 16- to 24-year-olds drinking alcohol has increased

Read the following passage and answer the given question.

London artist James Mylne has been creating photorealistic artwork using Bic ballpoint pens for 15 years. Individual works often take hours to complete, with each piece requiring intense concentration, as mistakes cannot be rectified.

120 The passage provides information that helps to answer which of the following questions?

- A** How many years does a single work take to complete?
- B** How many Bic ballpoint pens has James Mylne used so far?
- C** Does he usually make any mistake when working?
- D** What important prize has James Mylne recently been awarded?
- E** What main talent is required to complete a single work?

Read the passage and answer the following questions.

Phoebe wants to organize three dinners to meet her six friends (Sarah, Allyson, Barbara, Angie, Catherine, Ann). Phoebe decides to invite two of them at a time on Friday, Saturday and Sunday. She knows that:

- Sarah and Catherine always go out together but never on Friday;
- Allyson is always busy on Friday and Saturday;
- Angie and Barbara are always busy on Sunday.

121 According to the information given, whom will Phoebe invite for dinner on Friday?

- A** Allyson
- B** Catherine
- C** Ann
- D** Barbara
- E** Sarah

122 Find the missing number: 17, 20, 23, 26, 29, 32, 35, ?

- A** 37
- B** 38
- C** 39
- D** 40
- E** 41

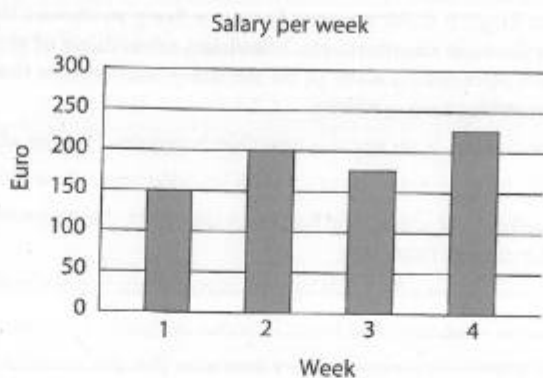
Read the following passage and answer the given question.

Nothing makes the skin crawl more than the idea that tiny bloodsucking bugs could be living in our bedrooms. Around the size of a lentil, the common bed bug, *Cimex lectularius*, can drink up to seven times its own weight in blood in one feeding, leave nasty, itchy bumps on their human hosts, and hide unseen for months on end. Since the late 1990s, the bed bug has become an increasingly common urban nuisance in homes and hotels worldwide. A 2010 survey from the University of Kentucky and the National Pest Management Association found that 95% of US pest control companies had treated a bed bug infestation in the previous year, up from 25% a decade before, and 11% before that.

123 Which of the following can reliably be inferred from the above statistic?

- A** The percentage of US pest control companies treatments doubled from 2000 to 2009
- B** The percentage of US pest control companies treatments doubled from 2009 to 2010
- C** In 2009 almost all US pest control companies treated infestations
- D** In 2010 almost all US pest control companies treated infestations
- E** In 2009 95% of the treatments were made against bug infestation

Look at the following graph and answer the questions.



124 What is the ratio of the second week's pay to the first week's pay?

- A $\frac{2}{3}$
- B $\frac{3}{2}$
- C $\frac{4}{3}$
- D $\frac{5}{4}$
- E $\frac{3}{4}$

125 Approximately, what is the difference, in Euros, between the biggest and the smallest pay-check?

- A 125
- B 25
- C 50
- D 100
- E 75

126 By what percent did the pay decrease from week 2 to week 3?

- A 12,5%
- B 25%
- C 5%
- D 2,5%
- E 50%

127 Two swimmers swim in two adjacent lanes. The first swims at a speed of two third of the speed of the second swimmer. By the time the second swimmer has swum five laps, in which lap is the first swimmer swimming?

- A Two
- B Three
- C Four
- D Five
- E Six

- 128** In tests designed to compare children's eating habits, children from primary schools in England and Germany were offered a choice between a chocolate bar and a piece of fruit. It was discovered that the English children were far more likely to choose the less healthy chocolate bar than their German counterparts. Television advertising of snack foods is restricted in Germany. If such advertising were to be similarly restricted in the UK, English children would adopt far healthier eating habits.

Which one of the following is an assumption that is required by the above argument?

- A** In England television advertising of snack food is aimed primarily at children.
- B** If television advertising of snack food had been unrestricted in Germany, more German children would have chosen chocolate.
- C** Children in Germany are less influenced by television advertising than English children.
- D** The same brands of chocolate and sweets are not available in Germany as in England.
- E** Television companies have a responsibility to ensure that the advertising on their channels does not put children's health at risk.

Read the following passage and answer the given question.

The US federal government, displaying even less sense than usual, has yielded to the French fry industry. Frozen French fries-sliced, fried in oil, and then packaged-are now approved as "fresh vegetables" by the US Department of Agriculture. The French fry industry has been petitioning the USDA for years to get this approval. They say that their product is similar to cucumbers that have a wax coating. They argue that they use 100 percent vegetable oil, which is much healthier for consumers than plain wax.

- 129** What's the main assumption of the French fry industry?

- A** Potatoes are sliced and fried
- B** Potatoes are fresh vegetables
- C** Potatoes are fried in vegetable oil so they are even healthier than cucumbers
- D** Fries are as healthy as cucumbers
- E** Fries are healthier than cucumbers

- 130** I only receive post from my uncle when it is my birthday or he is abroad. This letter is from him; it's not my birthday so he must be abroad again.

Which one of the following most closely parallels the reasoning used in the above argument?

- A** In order to make plans for a holiday it is first important to decide whether you want to go abroad or stay in the country. It is expensive to go abroad therefore you should consider staying in the country.
- B** Many people find it difficult to decide whether or not to take a gap year before going to university. Taking a gap year can give you a chance to think more carefully about what you want to study, therefore students who take gap years are often more prepared for university.
- C** At the current rate we will run out of landfill sites in the next two decades. Recycling would reduce the amount sent to landfill sites, therefore we should support recycling schemes.
- D** Most modern electrical goods have warranties, therefore you do not need to worry about repair costs if your new washing machine breaks.
- E** Politicians only talk about their children if they are publishing their memoirs or before a general election. The leaders of both parties have spoken about their children in interviews and have not written books, so you can be sure that there will be an election soon.

Read the following passage and answer the given question.

The present participle tells us what emotion or feeling the subject is causing. For example, 'Grammar is boring' means that the subject-grammar-causes an emotion of boredom. If we say, 'The movie is interesting,' we are saying that the movie causes a feeling of interest. If we say, 'The roller coaster is exciting,' we are saying that the roller coaster causes a feeling of excitement.

131 Which one of the following, if true, weakens the argument?

- A** Present participles don't relate only to emotions or feelings
- B** Emotions and feelings can be expressed only by present participles
- C** The present participle is a widely used tense
- D** The present participle is scarcely used in spoken language
- E** A feeling of excitement cannot be expressed by other adjectives

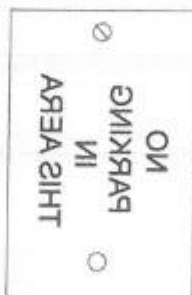
Read the following passage and answer the given question.

A jury trial might last one day or one month. If you work for the government, this is no problem, because the government will pay you your regular salary while you are on jury duty. However, if you are self-employed, you lose your regular income for that time period. Instead of your regular income, you get \$15 a day for sitting on a jury. This is another reason people try to avoid jury duty.

132 Which one of the following can be drawn as a conclusion from the above passage?

- A** Jury trials are not expensive for the government
- B** To be on jury duty means not to be paid your regular salary
- C** To be on jury duty is an important experience in life
- D** Civil servants are more likely to accept jury duty than self-employed people
- E** Self-employed people are more likely to accept jury duty than civil servants

133 When reversing my car into what I thought was a parking space, I looked through my rear view mirror and saw the following sign. It was hanging from the wall by one screw.



Despite the awkward orientation, I realised that one of the words had been printed incorrectly. Which word is incorrectly printed?

- A** AREA
- B** NO
- C** PARKING
- D** IN
- E** THIS

Read the following passage and answer the given question.

In 1993, I bought my first place, a two-bedroom condominium in Venice, for \$70,000. My friends thought then that I was overpaying. Five years later, I had to move. I sold it for \$230,000, which was a nice profit. Last year, while visiting friends here, I saw in the local paper that the exact same condo was for sale for \$510,000!

134 According to the information given, say which of the following statements is true.

- A** If he hadn't bought for \$70,000, he couldn't have sold for \$230,000
- B** If he hadn't sold for \$230,000, he wouldn't have bought for \$70,000
- C** If prices hadn't increased, he couldn't have got more than a 300% profit on the sale
- D** If prices hadn't increased, he would have had to sell for \$70,000
- E** If prices hadn't increased, he couldn't have got a 700% profit on the sale

135 Organ donation from the recently deceased should be mandatory rather than optional. This is because harvesting organs can save lives by transplanting a variety of organs from one donor to several different patients. It is immoral to expect to receive a donor organ unless you are willing to donate one. Cremating or burying bodies with healthy organs in them contradicts the medical care given to that body while it was alive.

Which one of the following illustrates the principle used in the above argument?

- A** Patients who die of disease should not have their organs harvested.
- B** Non-essential healthy organs should be taken from terminal patients while they are still alive.
- C** By accepting a blood transfusion you have an obligation to give blood.
- D** Cremations and burials should be made illegal, to help maximise organ donation.
- E** Donors who leave money to medical research after their death should be spared mandatory organ donation.

Read the passage and answer the following questions.

Five friends - Andrew, Billie, Chris, Dennis and Eleanor - go out to dinner. They arrange the meeting by smsses. Each of them sends two smsses to two different friends. At the end each of them has received an sms from two friends. In addition;

- Billie has received one sms from Andrew and one from Eleanor; she sent one of her two smsses to Eleanor;
- Chris sent one sms to Andrew and one to Dennis and has received no smsses from Eleanor and Andrew; Andrew sent one sms to Dennis.

136 According to the information given, to whom did Dennis send smsses?

- A** Andrew and Billie
- B** Chris and Eleanor
- C** Eleanor and Billie
- D** Chris and Dennis
- E** Billie and Dennis

137 According to the information given, Eleanor has received one sms from:

- A** Andrew
- B** Chris
- C** Dennis
- D** no one of the people mentioned
- E** it cannot be determined

138 If 30% of x is 210, then 75% of x is:

- A 47
- B 158
- C 525
- D 560
- E 700

139 Find the missing numbers:

?, 19, 17, 18, 16, 17, 15, 16, ?

- A 20, 14
- B 21, 17
- C 17, 18
- D 18, 14
- E 14, 17

140 Fill in the blank to complete the proportion.

Frequently : _____ = always : never

- A often
- B sometimes
- C seldom
- D ever
- E forever

Read the following passage and answer the given question.

A clone of your cat will cost \$50,000. First, your veterinarian must do a biopsy of your cat. This is sent to TwiN, Inc., where it is cultured to grow fresh new cells. These new cells are stored in liquid nitrogen until you notify TwiN, Inc., that you are ready for the clone. At this time, you pay half the amount (\$25,000). A cultured cell is implanted into a female cat that is in estrus, and a kitten is born about 60 days later. The new kitten is weaned in about eight weeks.

141 Which one of the following identifies the flaw in this argument?

- A It doesn't consider the probability of abortion or unsuccessful implantation into the female cat
- B It ignores the health conditions of the female cat
- C It assumes that anyone would like to have his or her own cat cloned
- D It ignores inflation and the rise of prices
- E It assumes that any veterinarian can do a biopsy of any cat

142 A woman drives a motorbike at a speed of 50 km per hour. Calculate the distance covered by the woman in 20 minutes.

- A 20,000 km
- B 50,000 km
- C 9,350 km
- D 16,670 km
- E 13,500 km

Read the following passage and answer the given question.

Crime in the city of Clio hit a 30-year low last year. There were 1,486 thefts last year. Most of the thefts involved cars. Thieves also robbed the people at gunpoint or pickpocketed them. They broke into houses and businesses at the alarming rate of two a day two years ago, but that rate was down to only one a day last year.

143 Which one of the following can be drawn as a conclusion from the above passage?

- ☐ A There has been a 50% decrease in shooting in one year
- ☐ B There has been a 50% decrease in robbery in one year
- ☐ C There has been a 50% increase in crime in one year
- ☐ D There has been a 50% increase in crime in thirty years
- ☐ E There has been a 50% decrease in crime in thirty years

Read the following passage and answer the given question.

In today's "global village", lifestyles have become international; often the American model has spread to other countries of the world. American sports, however, have not spread all over the world, as American films and American fashions have. On the contrary, European sports have been more successful internationally; European football, indeed, is slowly developing in the USA (where we call it "soccer").

144 Which of the following are underlying assumptions of the above argument?

1. Globalization means exporting a country's model to other countries
2. Globalization means exporting the American model to other countries
3. Globalization depends on how successful on the international scale a lifestyle is

- ☐ A 1 only
- ☐ B 1 and 2 only
- ☐ C 1 and 3 only
- ☐ D 2 and 3 only
- ☐ E 1, 2 and 3

Read the following passage and answer the given question.

You may be surprised to learn that the humble bicycle was invented several years later than the railway locomotive! But the two-wheeler has come a long way since the day it was invented by a Scottish blacksmith, Kirkpatrick MacMillan, back (it is said) in 1839.

145 Which one of the following is an assumption on which this argument depends?

- ☐ A It assumes that bicycle should have been invented before the locomotive
- ☐ B It assumes that the invention of the car was less important
- ☐ C It assumes that the invention of other means of transport was not as important
- ☐ D It assumes that the bicycle was invented in the late 19th century
- ☐ E It assumes that the bicycle was invented by a Scottish blacksmith

146 If you buy 4 marmalade jars you will get one more for free. How much is the discount for the five jars?

- ☐ A 25%
- ☐ B 5%
- ☐ C 30%
- ☐ D 15%
- ☐ E 20%

- 147 Two carpenters have to build some chairs and start on the same day. The first carpenter can make 16 chairs a day. The second carpenter produces 1 chair on the first day and then twice as many every following day. On which day will the number of chairs produced by the second carpenter start to exceed the number of those produced by the first carpenter (adding up the production of the previous days too)?

A On the fifth day
B On the sixth day
C On the seventh day
D On the eighth day
E On the fourth day

- 148 Two years ago, Marco was three times as old as Roberta. Today he is twice as old as Roberta. How old is Marco today?

A 10
B 4
C 6
D 8
E 9

Read the following passage and answer the given question.

Hundreds of thousands of young men had been killed during the war; who could take their place? There was an easy answer; men from the colonies! Britain was still the capital of an Empire that stretched to the four corners of the earth. In the developing countries of the Commonwealth, there were millions of young men, just looking for work. When the British authorities offered them the chance to come to Britain and work, thousands wanted to come. Today Britain is a multiracial country.

- 149 Which one of the following, if true, weakens the argument?

A Not every young man living in the developing countries of the Commonwealth decided to go to Britain
B Britain itself was a developing country during the war
C The British Empire didn't stretch to the four corners of the earth
D If war hadn't broken out, many people in Britain would be unemployed today
E If war hadn't broken out, Britain wouldn't be a multiracial country today

Read the following passage and answer the given question.

Proofreading eliminates language errors involving punctuation, grammar, spelling, format and style. Manuscripts written by native English authors and those at the final submission stage are proofread for a foolproof language check. Copyediting ensures correctness of language structure and rhetoric. As part of copyediting, word choice, style, sentence structure, comprehension, and terminologies are checked intensively and the content is tuned to achieve native-like English language.

- 150 Which one of the following is an assumption on which this argument depends?

A Any written text is worth reading
B Any written text needs correcting
C Any written text needs copyediting
D Any written text by native English authors must be proofread
E Any written text by non-native English authors must be corrected

- 151 In order to reduce their dependence on fossil fuels and promote renewable energy, many governments are spending billions of euros subsidising biofuel crops. But using maize and wheat to make biofuels significantly reduces the amount available to eat. Actually, it does not help the environment much either; many types of biofuels cause more greenhouse gas emissions than fossil fuels. Heavy use of fertiliser to produce sufficient crops releases damaging amounts of nitrous oxide, while demand for new land for biofuel plants causes forests to be torn down, resulting in more carbon going into the atmosphere. Experts say if global biofuel use increases as predicted, 600 million more people will be driven into hunger by 2020. Which one of the following can be drawn as a conclusion from the above passage?
- A Farmers currently use fertilisers far more extensively than they should.
 - B Using crops for biofuels causes more problems than it solves.
 - C World governments are wasting their money by subsidising biofuels.
 - D We need to make more land available to grow foodstuffs.
 - E We should be preserving forests, not tearing them down.

- 152 In principle, the larger the mirror of a reflecting telescope, the further one can see into space with it. The larger the mirror, however, the greater the weight of the steel needed to support it and maintain its shape. Such a mass of metal and glass stores a lot of heat during the day, enough to keep the mirror several degrees warmer than the surrounding air after sunset. The shimmering air above the warm mirror blurs the image of distant stars and galaxies. Given existing technology, therefore, there is no point building telescopic mirrors above a certain size.

Which one of the following is an assumption of the above argument?

- A Distant stars and galaxies can be seen perfectly well with existing mirrors.
- B There are no alternative types of telescopes that do not use mirrors at all.
- C Telescopes are normally sited in areas of the world that have hot climates.
- D Shimmering air caused by natural atmospheric conditions is not a problem for telescopes.
- E For very large mirrors, the blurring caused by heating cancels out the benefits of increased size.

Read the following passage and answer the given question.

A pair of Marie Antoinette's slippers and a garment she wore while in prison were auctioned in Paris to mark the anniversary of her execution. Among the 80 lots on offer were portraits and etchings of the queen and her ill-fated husband King Louis XVI.

- 153 The passage provides information that helps to answer which of the following questions?

- A When was Marie Antoinette arrested?
- B Did she spend her time in prison with her husband?
- C Did King Louis XVI have a nice life?
- D Was King Louis XVI executed before Marie Antoinette?
- E Which objects were auctioned to mark the anniversary of the Queen's and the King's executions?

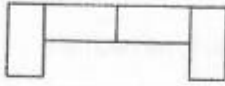
- 154 A joiner can make a wardrobe in three weeks. How many joiners can build two wardrobes in a week?

- A 9
- B 6
- C 4
- D 2
- E 3

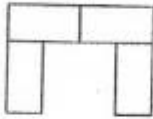
- 155 A local museum wishes to exhibit a collection of butterflies which is mounted in nine narrow (only 0.2 m wide) display cases, each 1.5 m long. The museum wants to arrange four tables, each 2 m long and 1 m wide, in such a way that all the display cases can be placed around the edges. The room for the exhibition is 6 m by 6 m and there must be at least 1 m of clear floor space around the outside of the tables.

Which one of the five arrangements shown would be satisfactory?

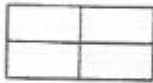
A



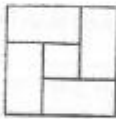
B



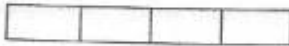
C



D



E



- 156 Children are being encouraged to take up gardening through special events at shows and activities in schools. It is hoped that an interest in gardening, and particularly growing one's own food, will make children more interested in learning about their food and they will therefore be deterred from eating junk food. The initiative should be supported and spread to more schools as quickly as possible.

Which one of the following, if true, would most weaken the above argument?

- A The practical experience of gardening is not a traditional academic subject.
- B It tends to be older people who are interested in gardening and growing their own food.
- C Most children have enjoyed the events provided, but have not gained an interest in gardening itself.
- D Some schools do not have a garden.
- E The events to encourage children to garden also included stands where junk food was for sale.

Read the passage and answer the following questions.

Seven men - Alan, Charles, Dave, Phillip, Louis, Paul and Robert - and five women - Brenda, Jackie, Mary, Nora and Sarah - go out to dinner together. They take seat in three adjacent four-seat tables. In addition:

- Paul is sitting in front of Nora;
- Phillip, next to Robert, is Jackie's husband but is not sitting at the same table as his wife, who is sitting in front of Mary and close to Charles;
- Sarah, who had an argument with Mary and with the woman sitting in front of Robert, is not sitting at the same table as Mary and the other woman;
- Dave is sitting in front of a woman and Louis is sitting close to two women.

157 According to the information given, Alan is sitting:

- A** in front of Sarah
- B** in front of Phillip
- C** at the same table as Nora
- D** in front of Charles
- E** at the same table as Mary

158 If during dinner Phillip changes seat with Mary:

- A** at the table where Louis is sitting there will be more men than women
- B** at the table where Robert is sitting there will be three women
- C** at the table where Paul is sitting there will be only men
- D** at the table where Brenda is sitting there will be more men
- E** at the table where Louis is sitting there will be more women than men

- 159 Many conceptual artists do not usually play any physical part in producing the artworks credited to their names beyond design and sometimes supervision. They do not draw, mould, sculpt, paint, etch or personally utilise any of the skills traditionally associated with artistic production. However, this is not important as the artwork is all that matters and without the ideas or concepts that they provide the artwork would not exist. Besides, this is a return to the workshop system of medieval European artists where a master employed several apprentices to do most of the work.**

Which one of the following best expresses the main conclusion of the above argument?

- A** Artists should be able to draw and paint.
- B** The medieval workshop system is the best way of producing art.
- C** Artists should physically produce their artworks.
- D** It is not important for conceptual artists to actually do the work.
- E** Apprentices are essential in the production of art.

- 160 Two trains start at the same time from the same station, travelling towards opposite directions with a respective speed of 70 mph and 90 mph. How much time will it take them to reach a 200-mile distance?**

- A** 10 hours
- B** 1,5 hours
- C** 5 hours
- D** 75 minutes
- E** 150 minutes

- 161** Some people have suggested that there is a difference between physiological addiction to a substance and psychological addiction. So they would want to distinguish between the physiological need for chemicals contained in certain substances – such as that for nicotine satisfied through smoking – and the mere psychological craving for, say, chocolate. However, studies show that chemicals are released in the brain when people satisfy a psychological craving. Therefore, there is no difference between the two types of addiction, as both involve a relationship between body chemistry and physical substances.

Which one of the following is a flaw in the above argument?

- A** A general statement is made on the basis of insufficient evidence.
- B** The availability of addictive substances is not sufficient to explain addiction.
- C** It lacks consideration of the seriousness of the effects of different substances.
- D** The cause of an addiction is being confused with the effect of an addiction.
- E** It assumes that psychological and physical addiction have different causes.

Read the following passage and answer the given question.

In my day, the classic bored teenager hung around the bus-stop with a few mates and someone produced a packet of 10 and a bottle of cider. Nowadays they are upstairs on the laptop, PS3 or mobile, gossiping and playing and flirting. It is a digital world where grown-ups are not allowed, a playground for the virtual teen rebel.

- 162** Which one of the following is an assumption on which this argument depends?

- A** The digital world helps teenagers communicate more
- B** In any time teenagers put on rebellious habits
- C** It is better to speak on a mobile phone than to drink a bottle of cider
- D** Today's teenagers have more mates
- E** Once teenagers were bored

Read the following passage and answer the given question.

Drugs: the Home Office published analysis which suggests the proportion of 16- to 24-year-olds that have ever taken illicit drugs has fallen from 54% in 1998 to 38% in 2012. Among 11- to 15-year-olds the figure has fallen from 29% to 17% in a decade.

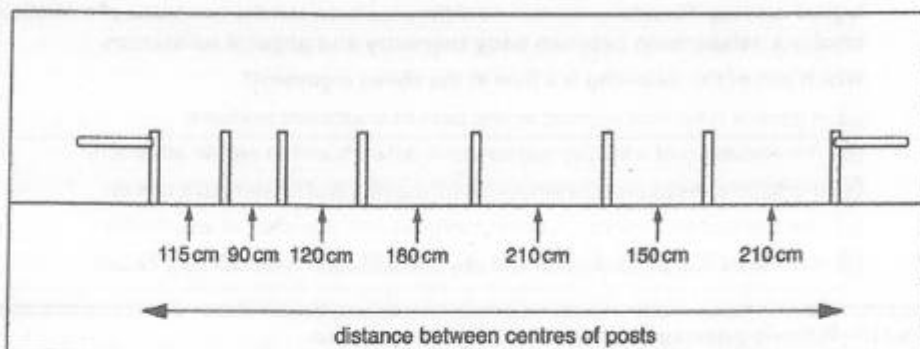
- 163** Which one of the following can be drawn as a conclusion from the above passage?

- A** Since the late Nineties drugs consumption by teenagers has fallen by more than 10%
- B** Since the late Nineties drugs consumption by teenagers has fallen by more than 20%
- C** From 1998 to 2012 drugs consumption by teenagers has increased by more than 10%
- D** Figures show that few early teen-agers are drug addicted
- E** Figures show that early teen-agers take more illicit drugs than the over 20-year-olds

- 164** Find the wrong word.

- A** Narrow
- B** Capacious
- C** Wide
- D** Broad
- E** Large

- 165 A farmer wishes to fix fencing rails to posts which are already in place. The posts are shown in the diagram. The farmer has a supply of rails, each one 2.4 m long. One rail or part of a rail is to be fixed between each pair of posts. (He can cut the rails into smaller lengths.)



What is the smallest number of rails that he could use?

- A 3
- B 4
- C 6
- D 5
- E 7

Read the passage and answer the following questions.

The front of a three-floor building has nine windows, three windows per floor, of different colour. In addition:

- the grey window is the central window on the second floor
- the first window at the left side of the facade on the first floor is yellow
- the red window is on the second floor and is just above the green one and below the white one
- the orange window is close to the black one and above the violet one.

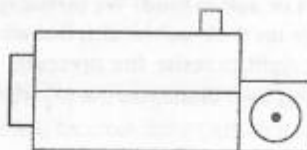
- 166 According to the information given, which of the following statements is wrong?

- A The brown window is just below the grey one
- B The black window is just above the brown one
- C The yellow window is just below the violet one
- D The red window is not close to the orange one
- E The red window is just above the green one

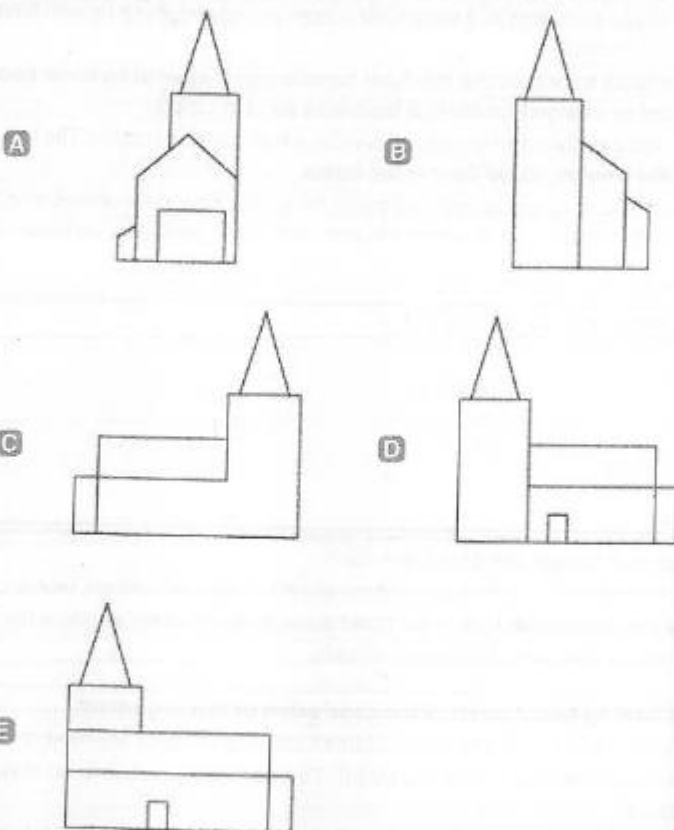
- 167 According to the information given, which of the following statements is true?

- A The violet window is on the second floor
- B The red window is on the first floor
- C The brown window is on the second floor
- D The orange window is on the second floor
- E The yellow window is just below the white one

- 168 Below is a line drawing of a church made by a surveyor as seen from directly above in an aeroplane. When the surveyor returns to the ground she wants to identify which particular church it was she drew.



Which one of the churches drawn below, as seen from ground level, could NOT be the one drawn above?



- 169 The camel now has a bright future in India. The rising cost of oil is making it much more expensive for Indian farmers to run tractors whereas the camel is cheap to feed.

Which one of the following, if true, would strengthen the above argument?

- A The cost of buying a camel has risen 50% in a decade.
- B Shrinking grazing areas and lack of food threaten substantial camel revival.
- C Though camel slaughter is banned, illegal export of camel meat is increasing.
- D Camels can live and work for 70 years with very little maintenance.
- E Camels were traditionally highly prized as the 'ships of the desert'.

- 170 Food producers are resisting pressure to reduce still further the levels of salt in food. Although it is proven that salt intake must be reduced by those with hypertension, there is no evidence that reducing salt intake prevents hypertension. So why should we all be deprived of the pleasures of salt in food? We certainly need to identify those with hypertension and give them advice on their salt intake, but why should everyone else be deprived of salt? Food producers are right to resist the pressure.

Which one of the following best illustrates the principle underlying the argument above?

- (A) The requirement to wear seatbelts has reduced deaths in car accidents but was unpopular when first introduced. People eventually accepted such changes even if it has not benefited them personally.
- (B) Retailers cannot sell alcohol to people under 18 years, but providing more general advice on alcohol in schools would be better, as it would encourage young people to be self-limiting in their consumption of alcohol.
- (C) Advice to wear sun block to protect the skin from harmful rays is ignored by some people. Those people should be charged for medical treatment for skin cancer.
- (D) Passive smoking is still a problem for people who share a home with a smoker. The law should be extended to make smoking illegal even in the home.
- (E) Adding fluoride to drinking water has reduced tooth decay, but fluoride is unwelcome to some people. Instead, dentists should advise patients with tooth problems on better tooth care.

- 171 Find the missing number: 3, 9, 12, 36, 39, 117, ?

- (A) 120
- (B) 351
- (C) 234
- (D) 119
- (E) 162

Read the following passage and answer the given question.

There is some evidence that humans and cats first learned to cohabit in the Middle East, where cat bones are often discovered among the architectural ruins. But there is nothing sentimental about the relationship between people and the cats that roam Jerusalem's streets.

- 172 Which one of the following best expresses the conclusion of this argument?

- (A) Cats may be cohabiting with humans in the Middle East because they are fond of humans
- (B) Cats may be cohabiting with humans in the Middle East because in urban areas their need of food is best satisfied
- (C) Cats may be cohabiting with humans in the Middle East because in urban areas their need of food was certainly best satisfied in the past
- (D) Cats used to cohabit with humans in the past times but certainly not today
- (E) Undoubtedly in the Middle East cats died out because of some disease

- 173 Fill in the blank to complete the proportion.

Step : _____ = brick : house

- (A) window
- (B) floor
- (C) stairs
- (D) door
- (E) table

Read the following passage and answer the given question.

Taking a daily multivitamin pill may lower the risk of developing cancer in men, US researchers have claimed. However, some studies suggest multivitamins cause more harm than good when taken by healthy people while others have shown no benefit in cancer.

174 Which one of the following is an assumption on which this argument depends?

- A** Multivitamin pills should be taken daily
- B** Multivitamin pills might play a role in treating cancer
- C** There is always much controversy about the results of clinical trials
- D** Little research has been done about multivitamins
- E** More and more research has been done about cancer

175 If half of the money in a mutual fund was invested in stocks, one fifth in bonds and the remaining \$ 300,000 in cash, what was the total amount of the mutual fund?

- A** \$ 1,000,000
- B** \$ 1,800,000
- C** \$ 2,200,000
- D** \$ 2,600,000
- E** \$ 4,000,000

176 The value of a historic motorbike increased by 30% from 1980 to 1985, but decreased by 20% from 1985 to 1990. What is the ratio between the value of the motorbike in 1990 and the value of the motorbike in 1980?

- A** 90%
- B** 100%
- C** 104%
- D** 110%
- E** 124%

177 Fill in the blanks to complete the proportion.

_____ : painter = book : _____

- A** Colour, shape
- B** Dish, drink
- C** Computer, printer
- D** Picture, writer
- E** Eyes, mouth

Read the following passage and answer the given question.

Faecal matter can be found on just over a quarter of our hands, new research suggests. In some cases the quantity of germs is equivalent to the number in a dirty toilet bowl. So why are the British so bad at washing their hands?

178 What could the title of the above passage be?

- A** The importance of washing hands
- B** The importance for the British to wash their hands
- C** The importance of cleaning toilets
- D** What faecal germs are
- E** Where faecal germs live

Read the following passage and answer the given question.

World-famous Turkish pianist Fazil Say has appeared in court in Istanbul charged with inciting hatred and insulting the values of Muslims. He is being prosecuted over tweets he wrote mocking radical Muslims, in a case which has rekindled concern about religious influence in the country.

- 179 Which one of the following can be drawn as a conclusion from the above passage?**
- A** In Turkey religion still proves to be a hot issue
 - B** The Turkish judiciary system has been prosecuting the non-Muslims
 - C** The Turkish judiciary system is concerned about the religious influence in the country
 - D** Writing tweets against religion should be forbidden
 - E** Turkish pianist Fazil Say will soon be convicted of racism
- 180 Every day John covers the distance from home to school as follows: $\frac{1}{5}$ of the way on foot; $\frac{2}{3}$ of the way by bus and 8 km by bike. How far is school from John's house?**
- A** 90 km
 - B** 120 km
 - C** 60 km
 - D** 30 km
 - E** 45 km

Read the following passage and answer the given question.

The head of Saudi Arabia's religious police has said there is a pressing need to employ more women in the force. Correspondents say the introduction of women could be a sign of the king's cautiously reformist agenda. There is no indication that the introduction of women into the religious police would necessarily make the rules any less strict, but it would boost the presence of women in public life.

- 181 Which one of the following is an assumption on which this argument depends?**
- A** The need of women in public life
 - B** The importance of women in police
 - C** The need of involving women in the religious police
 - D** The king of Saudi Arabia has certainly been designing a reforming political programme
 - E** Police rules will be made less strict
- 182 In a scale numbered from 1 to 10 numbers are matched with letters D, L, M, O and P (not necessarily in this order). Every single letter is matched with one number and each number is matched with one letter only. In addition:**
- the sum of the numbers matched with the five letters is 24;
 - 8 is matched with letter O;
 - L is matched with the number preceding the one matched with letter M;
 - D is matched with the number preceding by two numbers the one matched with letter L.
- According to the information given, it can be inferred that:**
- A** P is matched with 4
 - B** M is matched with 7
 - C** L is matched with 5
 - D** D is matched with 1
 - E** O is matched with 9

- 183** Although the Earth supports life, it has a mysterious carbon deficit. Compared with other bodies in the solar system the Earth has far less carbon than would be expected for a planet that supports life. Originally it was thought that in the inner region of the dust disc where the Earth formed, temperatures soared high enough for the carbon to boil away. However, observations of developing solar systems have now suggested that the temperature would not have been high enough. It is more likely that fire is to blame. Hot oxygen atoms would have readily combined with carbon, burning to produce carbon dioxide. There would have been fewer of these oxygen atoms further away from the Sun.

Which one of the following, if true, would most strengthen the above argument?

- A** There is no theoretical reason why life has to be carbon-based.
- B** At temperatures that are high enough for carbon to boil away, oxygen would also have boiled away.
- C** The carbon that is present on the Earth could have arrived at a later date from an asteroid.
- D** The abundance of carbon in the asteroid belt surrounding the inner planets increases the further away you get from the Sun.
- E** There are other solar systems with Earth-like planets that have an abundance of carbon on them.

- 184** Joey the balloon clown has 10,000 litres of helium with which to blow up his balloons for tomorrow's show. He has five different types of balloon and knows by experience how much extra helium must be put in the balloons if they are to have the correct amount of helium tomorrow, as they lose some overnight. Also, some shapes of balloon are more likely to burst than others. Joey wants the maximum number of balloons for tomorrow's show.

Balloon type	Normal capacity (litres)	Extra helium required for overnight loss (litres)	% that burst
Star	100	20	5
Heart	90	0	15
Flower	80	10	5
Diamond	70	20	10
Bubble	60	40	5

Which type of balloon does he choose?

- A** Diamond
- B** Star
- C** Bubble
- D** Heart
- E** Flower

- 185** Alex is Laura's brother and Laura is Stephen's mother. Michael is Paul's son, he married Lucy and had a daughter, Corinne. Alex and Michael have the same parents. As a consequence:

- A** Laura is Corinne's aunt
- B** Paul is Corinne's uncle
- C** Michael is Laura's cousin
- D** Stephen is Alex's cousin
- E** Laura is Corinne's sister

- 186** In a quiz the following method is used for scoring: 3 points are given for a correct answer, 1 point is taken away for an incorrect answer and 0 points are awarded for an unanswered question. The quiz consists of 10 questions. Addition of the scores was incorrectly done in one case and an impossible result was announced.

Which team has an impossible result?

- A** Red Lions: 5
- B** Brown Bears: 25
- C** Green Dragons: 10
- D** Blue Birds: 18
- E** White Horses: 26

- 187** Fill in the blank to complete the proportion.

Edinburgh : _____ = Cardiff : Wales

- A** Scotland
- B** Great Britain
- C** Glasgow
- D** Ireland
- E** United Kingdom

Read the following passage and answer the given question.

Newsweek, the 80-year-old US current affairs magazine, is to become an online-only publication. The last print edition will be on 31 December, reflecting the trend for newspapers and magazines to move online as traditional advertising declines. Newsweek merged with the internet news group the Daily Beast two years ago. The Daily Beast's founder, Tina Brown, said its site now had more than 15 million unique visitors a month, a 70% increase on last year.

- 188** Which of the following are underlying assumptions of the above argument?

1. Newsweek is one of the US's historical magazines.
2. Press is moving online more and more.
3. Newsweek's site has more and more visitors.

- A** 1 only
- B** 1 and 2 only
- C** 1 and 3 only
- D** 2 and 3 only
- E** 1, 2 and 3

Read the following passage and answer the given question.

Twitter has blocked access to a neo-Nazi account at the request of the German government. The tweets will no longer be visible to users in Germany although the rest of the world will be able to view them. It is the first time the social networking site has implemented its local censorship policy, which came into force in January. That policy allows it to block content in specific countries if tweets violate local laws.

- 189** According to the information given, say which of the following statements is true.

- A** Censorship has not been implemented since January
- B** Censorship had not been implemented since January
- C** Censorship will be implemented again in the future
- D** None in the world could ever visit the German censored tweets
- E** The German government arrested the neo-Nazi authors of the tweets

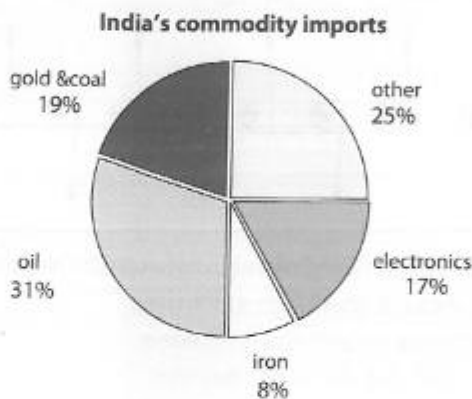
Read the following passage and answer the given question.

Although Britain is reputed to be a country where ethnic minorities integrate easily, Britain's Blacks - also known as Afro-Caribbeans - certainly suffer from a degree of passive discrimination. And in times of economic difficulty, things often get worse.

190 Which one of the following identifies the flaw in this argument?

- A It assumes that every single Britain's Black is usually discriminated
- B It assumes that economic recession is the cause of discrimination
- C It ignores the number of Britain's Whites unemployed people
- D It ignores those Britain Blacks who didn't integrate easily
- E It ignores what happens during economic recovery

Look at the following graph and answer the questions.



191 Approximately, what is the ratio of electronics to iron?

- A 2/1
- B 1/2
- C 4/3
- D 8/2
- E 2/5

192 What commodity makes up about 1/3 of India's imports?

- A Electronics
- B Iron
- C Gold & coal
- D Other
- E Oil

193 The combination of iron, electronics and gold & coal is approximately what percent of the commodity import?

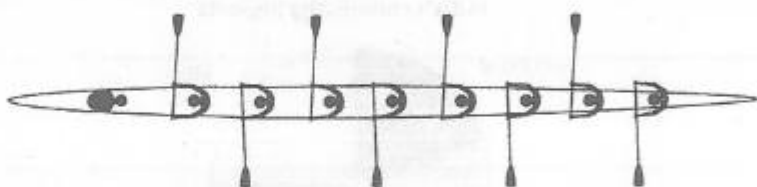
- A 39%
- B 44%
- C 49%
- D 52%
- E 54%

194 Find the missing number:

25, 23, 20, 18, 15, 13, 10, ?

- A 12
- B 8
- C 7
- D 5
- E 4

195 A picture of a boat with eight rowers is shown below. The distance between the entry and exit point of each oar is 6 m (relative to the boat) and the oars are in the water for 50% of the time. The rowers are 1.5 m apart in a boat 17 m long. When the stroke rate is 30 per minute, the boat is moving forward at 5 m/s.



Relative to the water, what is the relationship between the oar entry and exit points?

- A The oar exits 1 m ahead of where it enters the water.
- B The oar exits 1 m behind where it enters the water.
- C The oar exits 5 m ahead of where it enters the water.
- D The oar exits 6 m behind where it enters the water.
- E The oar exits 6 m ahead of where it enters the water.

196 James and Matthew do a running competition. Matthew leaves 90 metres before James. The time James runs 8 metres, Matthew runs 5 metres. How many metres will James have run before reaching Matthew?

- A 150
- B 180
- C 210
- D 220
- E 240

197 Claudia and Mauro go shopping. In the first shop Mauro spends 12 Euro, that is one quarter of Claudia's total expense in that shop. In the second shop Claudia spends three times as much as Mauro, who spends half the money spent by Claudia in the first shop. How much do Mauro and Claudia spend together?

- A 196 Euros
- B 96 Euros
- C 180 Euros
- D 120 Euros
- E 156 Euros

- 198 Not only has the price of a bottle of juice been increased from f1.20 to f1.44, but the size of the bottle has also been reduced from 2.5 litres to 2.4 litres.

In terms of price per litre, by what percentage has the cost of juice risen?

- A 25%
- B 20%
- C 16%
- D 24%
- E 12%

- 199 The ticket machines for the Hong Kong Mass Transit Railway do not give change, but they will credit any surplus money towards the next ticket if I buy more than one.

I have only two \$5 coins and two \$2 coins.

Which one of the following collections of tickets can I buy without wasting any money?

- A One \$4 and one \$7 ticket
- B Three \$2 tickets
- C One \$11 ticket
- D Three \$3 tickets
- E Two \$9 tickets

Read the following passage and answer the given question.

China's economic growth tumbled to the lowest in more than three years in the latest quarter but retail sales and investment improved in a possible sign a painful slump might be stabilizing. The world's second-largest economy grew 7.4 percent in the three months ending in September, data showed Thursday. That was down from the previous quarter's 7.6 percent and the lowest since the first quarter of 2009.

- 200 Which one of the following best expresses the conclusion of this argument?

- A Economic growth has been stabilizing over the last three years
- B Economic growth is better now than in the first quarter of 2009
- C Retail sales and investments are the only positive aspects in the general decrease of China's economy
- D Retail sales and investments added to the general decrease of China's economy
- E The world's second-largest economy may soon become the third-largest economy

Read the following passage and answer the given question.

The moon - for all its silent loveliness - was born in violence. About 4.5 billion years ago, a planet-sized object rammed the Earth and reduced it to a bleeding molten gob of star-stuff, leaking like a Junior Mint shot by an air rifle. As the Earth slowly reformed, the debris left over from the invading object coalesced into the small companion satellite that gives us our tides and illuminates our romantic night-time strolls.

- 201 What title would you give to the passage above?

- A The birth of the Moon
- B Why the Moon looks so lovely
- C What happened to the Earth about 4 billion years ago
- D How satellites form
- E The Moon and the tides

Read the following passage and answer the given question.

Earthlings will never be terribly sophisticated cosmic tourists. Ask us which worlds we'd like most to visit and our answers are often the same: Mars! Jupiter! Saturn! Neptune! But there's a short-sightedness in that - a little like going on a world tour and limiting your stops to London, Paris, Tokyo and New York. They're fantastic places all, but as any global traveller will tell you, if you really want to learn a culture and grasp its richness, you've got also to visit the provinces.

202 Which one of the following identifies the flaw in this argument?

- A** It assumes that any cosmic tourist would not be willing to visit other than the best known places
- B** It ignores that people know nothing about the universe
- C** It ignores that the Earthlings are not cosmic tourists
- D** It ignores that people are not used to thinking of the universe as a place to visit as tourists
- E** It ignores that some people may not be a cosmic tourist

Read the following passage and answer the given question.

I am, luckily, a theater reviewer who doesn't have to review everything I see. I try to write about the shows that stand out in some way - both good and bad. Some shows are just too routine to bother with. Others don't have broad enough interest for the mainstream, mostly non-New York audience that I'm writing for. And some shows just seem superfluous.

203 Which one of the following is an assumption on which this argument depends?

- A** Theater reviewers have to see the plays they review
- B** Theater reviewers have to review any play they see
- C** The author of the passage write for non-New York audience
- D** Any reviewer likes both good and bad plays
- E** A few plays are not worth reviewing

Read the following passage and answer the given question.

You hardly have to have seen a James Bond movie to know a little bit about 007. He's one of the most famous fictional spies in the world, and his presence in global pop culture is overwhelming. The way he says, "Bond. James Bond." The way he takes his martini. The way he rides off into the sunset, usually in a boat, with a different girl every adventure. These Bondian elements are stuck in our pop-culture brains.

204 Which one of the following is an assumption on which this argument depends?

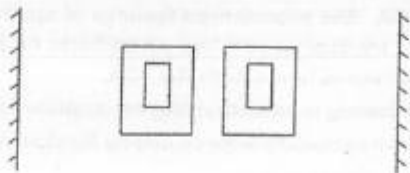
- A** It assumes that not everyone sees movies
- B** It assumes that our minds are stuck with popular culture
- C** It assumes that we all know some details of James Bond's life
- D** It assumes that some fictional characters are part of our culture
- E** It assumes that we all like Bond's adventures

205 Find the missing number:

3, 5, 8, 13, 21, ?

- A** 28
- B** 23
- C** 20
- D** 34
- E** 41

- 206 I am hanging pictures with identical sized frames in a space between two walls. Each picture is 18 cm wide by 24 cm high. The distance between the walls is 64 cm. I think they look best if they are centred in the space and the distance between the pictures is 6 cm. The hooks are to go behind the pictures, so I must mark their positions on the wall by careful measuring.



If the hooks are at the centres of the picture frames, how far should each hook be from the nearest wall?

- A 11 cm
- B 12 cm
- C 22 cm
- D 31 cm
- E 20 cm

Read the following passage and answer the given question.

In the past three weeks, the Congressional Budget Office (CBO) has released two reports that seem to justify contradictory fiscal policies. The first calculated that the U.S. economy could be thrown into recession because of existing legislation to reduce the deficit sharply next year (the so-called fiscal cliff). The second projected that the U.S. will face an eventual financial crisis if the deficit is not reduced sharply. So what are we supposed to do?

- 207 According to the information given in the passage, what is the contrast between the two reports?
- A The first states that the crisis will be caused by the reduction of the deficit, the second states that there will be no crisis if the deficit rises
 - B The first states there will be economic recession next year, the second ignores any risk of crisis
 - C The first states that the crisis won't be caused by the reduction of the deficit, the second states that there will be a new crisis if the deficit is reduced
 - D The first states there is not a good legislation to reduce the deficit, the second ignores it exists
 - E The first states that the crisis will be caused by the reduction of the deficit, the second states that there will be no crisis if the deficit is reduced

- 208 Fill in the blank to complete the proportion.

_____ : honey = worm : silk

- A Salmon
- B Leaf
- C Sugar
- D Milk
- E Bee

- 209 Studies are taking place to assess the benefits to dental health of adding fluoride to drinking water, a process known as mass medication. The Health Minister has urged consideration of fluoridation, particularly in deprived areas where dental care is poor. Fluoride can occur naturally in the water because of fluoride containing minerals. Fluoride, if in the water, improves dental health by up to 50 percent. Even so, fluoridation should not take place. A campaign leader opposed to fluoridation has spoken of her experiences of living in a fluoridated area of the USA. She experienced feelings of apathy and depression; her 2 year old son showed autistic tendencies and had white flecks on his teeth. These symptoms disappeared when they returned home from the USA.

Which one of the following is an underlying assumption of the argument above?

- A The reported health symptoms were caused by fluoride in the water.
 B Mass medication is always wrong.
 C Fluoridation is cheaper than improving dental facilities.
 D Fluoridation is only necessary in deprived areas.
 E Fluoridation of water is a person's only source of fluoride.
- 210 Jane is ordering desks for the new office building. The desks are to be ordered from a catalogue which offers a modular system. The prices of the components are shown below:

Desk top and back panel	Grey finish	Wood effect finish
1800 mm wide	€100	€120
1500 mm wide	€80	€95
1200 mm wide	€60	€70
800 mm wide	€50	€55
Legs (sets)		
Cantilever steel	€30	€30
Wood effect panel	€30	€35
Pedestal & accessories		
Pedestal with one drawer and one filing draw	€60	€70

The desks for the accounts clerks are to be:

- 1500 mm wide
- wood effect finish
- cantilever steel legs
- with a fixed one drawer and filing drawer pedestal.

How much will one of these desks cost?

- A €195
 B €170
 C €190
 D €200
 E €220

Read the following passage and answer the given question.

New numbers released by the U.S. government on Tuesday show record-low birth rates in 2011: the general fertility rate (63.2 per 1,000 women ages 15 to 44) was the lowest ever recorded; the birth rate for teenagers ages 15 to 19 declined; birth rates for women ages 20 to 24 hit a record low; and rates for Hispanic and non-Hispanic black women dipped. Some birth rates remained unchanged, like those of women in their late 40s. Only women aged 35 to 39 and 40 to 44 are more likely to have babies now than in the past.

211 Which of the following can reliably be inferred from the above statistic?

- A** Younger women have more babies than older women
- B** The younger the women, the lower the birth rate
- C** Younger women have less babies than Hispanic and non Hispanic black women
- D** The older the women, the lower the birth rate
- E** Women in their late 40s have more children than in the past

Read the following passage and answer the given question.

We all have days that we don't want to go in to work. We may even dislike what we do for work. But do you really hate the idea of going in? Do you spend so much time worrying about what will happen when you go to work that you don't enjoy your time away from work? If this is the case, it might be time to find a new job, or even start a business.

212 Which of the following is the best statement of the flaw in the above argument?

- A** It assumes that any of us works or has a job but some don't, actually
- B** It assumes that every now and then we are all in need of a new job
- C** It ignores that people need to work
- D** It ignores that someone likes what he or she does for work
- E** It ignores that many people have no time to find a new job

213 Fill in the blank to complete the proportion.

History : past = science : _____

- A** languages
- B** maths
- C** nature
- D** literature
- E** education

214 If the following formulas are true:

$$\clubsuit + \heartsuit = @$$

$$@ + \heartsuit = \heartsuit$$

$$\heartsuit - \clubsuit = 2$$

♠ is equal to:

- A** 1
- B** 5
- C** It cannot be determined
- D** -1
- E** 8

215 Find the synonym of the word given.

Sapid

- A** Salty
- B** Tasty
- C** Uninteresting
- D** Bored
- E** Spicy

- 216** Tom is having a celebration and needs to send out 50 invitation cards. The cards must be at least 6 cm wide and at least 8 cm high and Tom wants to put a photo on the card. Each type of card has a standard version and a deluxe version. The prices (per card) that have been quoted to Tom are shown in the table below:

Width (cm)	Height (cm)	Photo?	Personalised greeting?	Price (standard)	Price (deluxe)
6	6	Y	N	€0.90	€1.65
6	10	N	Y	€1.00	€1.60
6	10	Y	Y	€1.75	€2.15
7	7	Y	N	€1.40	€1.90
7	10	Y	N	€1.50	€1.95
7	10	Y	Y	€1.60	€2.15
10	10	Y	N	€2.25	€2.95

Tom wants to buy the cheapest type of card possible but is willing to pay for the deluxe version instead of the standard.

What is the total extra that Tom would have to pay to buy the deluxe cards?

- A** €20.00
- B** €25.00
- C** €27.50
- D** €30.00
- E** €22.50

- 217** On a shelf there are 6 books close to one another, from left to right in the following order: a book of history, a novel, a detective story, an essay, a handbook and a poem collection. After the cleaning, the books are placed in a different order.

- At the left of the poem collection there is only the detective story;
- The book of history is equidistant from the poem collection and the novel;
- The essay is equidistant from the detective story and the handbook.

What is the correct order of the books from left to right?

- A** Poem collection, detective story, essay, book of history, handbook, novel
- B** Detective story, poem collection, book of history, novel, handbook, essay
- C** Detective story, poem collection, essay, book of history, handbook, novel
- D** Detective story, poem collection, book of history, essay, handbook, novel
- E** Novel, detective story, poem collection, book of history, essay, handbook

- 218** William is celebrating his wedding day in a restaurant. His 72 guests are sitting at 8 tables. No matter where they take seat, there will always be at least one table where only men are sitting. How many men - minimum number - are invited to William's wedding?

- A** 9
- B** 63
- C** 10
- D** 64
- E** 12

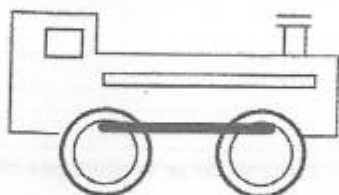
Read the following passage and answer the given question.

The health risks of mercury exposure are well documented, and the harms for still-developing fetuses are particularly concerning. Now, the latest study finds that kids who were exposed to more mercury in the womb were more likely to show problems with attention and hyperactivity and other symptoms of ADHD (Attention Deficit Hyperactivity Disorder) at age 8.

219 Which one of the following best expresses the conclusion of this argument?

- (A) Hyperactive children must have been exposed to mercury
- (B) Mercury exposure can be avoided during pregnancy
- (C) The less the mercury exposure in the womb, the more hyperactive the child
- (D) The higher the mercury exposure in the womb, the more hyperactive the child
- (E) The higher the mercury exposure in the womb, the less hyperactive the child

220 The picture shows a steam railway locomotive. On each side the two wheels are connected together by a long steel connecting rod. The wheels have a circumference of 3 m. The locomotive moves forward 10 m.



Which one of these diagrams shows the wheels and the rod after the movement?



Read the following passage and answer the given question.

Tobacco: National Health Service analysis suggested the proportion of 16- to 19-year-olds who have never smoked has risen from about two-thirds in 1998 to three-quarters in 2012. And the data is just as striking among their younger brothers and sisters. In 1982 most 11- to 15-year-olds (53%) had a sneaky cigarette at one time or another. Today, just a quarter has ever spluttered over a fag behind the bike sheds.

221 Which one of the following can be drawn as a conclusion from the above passage?

- A** Two-thirds is more than three-quarters
- B** From 1998 to 2012 smoking by teen-agers has fallen
- C** From 1998 to 2012 smoking by teen-agers has risen
- D** From 1998 to 2012 smoking by sisters and brothers has fallen
- E** From 1998 to 2012 smoking by sisters and brothers has risen

222 Fill in the blank to complete the proportion.

Tell : _____ = look : watch

- A** sleep
- B** hear
- C** smile
- D** see
- E** say

223 If you invest \$ 4,000 for 4 months at an interest rate of 12% you will gain:

- A** \$ 100
- B** \$ 160
- C** \$ 10
- D** \$ 320
- E** \$ 8,000

224 Find the missing number:

39, 13, 6, 30, 10, 3, 15, ?

- A** 45
- B** 9
- C** 5
- D** 10
- E** 4

225 Rachel wants to take part in three meetings hold by three different organizations. They will all take place in the same week. What is the probability that two or all the meetings will take place in the same day?

- A** About 25%
- B** More than 60%
- C** Less than 10%
- D** About 75%
- E** Less than 40%

Read the following passage and answer the given question.

The Dutch lighting and consumer electronics giant Philips has seen earnings more than double after disposing of its loss-making television business. Net profit for the third quarter was 169m euros (\$220m; £138m) compared to 74m euros in the same period last year. Shares in the company rose 4.6%. But Philips warned it is facing a string of "headwinds", including in Europe, which is suffering from the continuing debt crisis.

226 According to the information given, say which of the following statements is true.

- A** Philips's present earnings are falling because of the economic crisis
- B** Philips's television business has recently been improved
- C** Philips doesn't invest on the television business anymore
- D** Last year's net profit was higher than this year's
- E** Shares have been growing despite the television business

Read the following passage and answer the given question.

In Austria and Germany, the traditional costume known as Tracht always used to be the preserve of the ultra-conservative. But these traditional clothes - lederhosen for men and dirndl dresses for women - have recently become rather fashionable. In post-war Austria, it has often been seen as a political statement. "For many years, wearing Tracht was associated with conservative or even far-right ideology," one Viennese told me. "During the Nazi era, Jews were forbidden from wearing it - and later it was often taken as a sign that you were not open to the world. But that is changing. In fact these days it is really trendy."

227 What title would you give to the passage above?

- A** Traditional clothes revival in Austria and Germany
- B** Traditional clothes and ideologies in Europe
- C** Austrian and German fashion business today
- D** New fashion trends in Europe
- E** Crisis and clothes in Austria and Germany

228 Fill in the blank to complete the proportion.

_____ : sky = fish : sea

- A** Dog
- B** Flight
- C** Air
- D** Bird
- E** Shell

229 The 'Peter Principle' is commonly believed by many people, even if they do not know its name. It states that 'everyone rises to their level of incompetence': that is, that people are eventually promoted to a job that they are not capable of doing. Unfortunately, the principle is fatally flawed by the absence of any academic results to support it. Recent research in the field of psychology has provided no hard evidence for it and all the examples given by the general public are opinions and judgements, not proven fact.

Which one of the following, if true, would most weaken the argument above?

- A** Employees can be demoralised if they are made to feel incompetent.
- B** Not everyone is incompetent in the job they are currently doing.
- C** Not everyone has the opportunity for promotion.
- D** Lots of decisions are based on opinions and judgements.
- E** Psychology is not the only discipline relevant to testing the 'Peter Principle'.

230 Find the missing letters:

d, d, x, e, e, w, f, f, v, g, g, ?

- A** h, u
- B** h, v
- C** h, i
- D** h, w
- E** u, h

231 Find the missing number:

8, 24, 12, 72, 18, 162, 27, ?

- A** 270
- B** 9
- C** 324
- D** 81
- E** 85

Read the following passage and answer the given question.

The world's oldest undeciphered writing system, which has so far defied attempts to uncover its 5,000-year-old secrets, could be about to be decoded by Oxford University academics. This international research project is already casting light on a lost bronze age middle eastern society where enslaved workers lived on rations close to the starvation level. A special device, part sci-fi, part-DIY, is being used to help decode a writing system called proto-Elamite, used between around 3200BC and 2900BC in a region now in the south west of modern Iran.

232 According to the information given, say which of the following statements is true.

- A** After decoding the proto-Elamite writing system, there won't be any writing system left undeciphered in the world
- B** English research about writing systems' deciphering has brought about no important achievements
- C** English research about the deciphering of an Iranian writing system has not given important results yet
- D** An English deciphering's device may prove to be successful in decoding a proto-Elamite writing system
- E** An English deciphering's device proved to be successful in decoding a proto-Elamite writing system

233 Five people – A, B, C, D, E – are interviewed. Three of them answer "no" to the question asked and two of them answer "yes". B gave the same answer as C. D didn't give the same answer as E and B. What can be inferred from this information?

- A** A and E answered "yes", while B, C and D answered "no"
- B** A and D answered "yes", while B, C and E answered "no"
- C** B and C answered "yes", while A, D and E answered "no"
- D** B, C and E answered "no", while A and D answered "yes"
- E** A, C and E answered "no", while B and D answered "yes"

234 The price of "Blue line" tiles is proportional to their surface. A "Blue line" square tile with a side of 14 cm costs 12 Euros. How much is the discount for a "Blue line" square tile with a side of 20 cm costing 21 Euros?

- A** Less than 10%
- B** A little more than 15%
- C** A little less than 12,5%
- D** About 24%
- E** About 20%

235 A jeweller sells a watch with a 18% reduction on the price, that is a 36 dollar reduction. What was the price of the watch?

- A** \$ 160
- B** \$ 210
- C** \$ 185
- D** \$ 200
- E** \$ 150

236 During everyday conversations, most people make eye contact from time to time. Because failure to make eye contact is seen as abnormal, we think that someone who does not do this is rude. We may even think that they are bored, or have something to hide, or their minds are elsewhere. But recent research on teaching children has shown that the children absorbed more facts if they did not look at the person addressing them than if they did. This is thought to be because looking at someone requires the processing of unnecessary information. Other research has shown that some people who are lying gaze directly at others in order to convince them that they are open and honest. Police interrogators often take this as a sign of dishonesty.

Which one of the following can be drawn as a conclusion from the above passage?

- A** Gazing directly at others when speaking is reliable evidence of dishonesty.
- B** Failing to make eye contact with their teachers is a sign that children are rude.
- C** Someone who looks away when spoken to is trying to concentrate on what is said.
- D** Eye contact during conversation is not a reliable indicator of either honesty or engagement with the speaker.
- E** Failure to make eye contact during conversation is a reliable sign of lack of interest.

Read the following passage and answer the given question.

Rising numbers of people of Indian origin born in the West are moving "back" to the country their parents left decades ago. With India's economy growing faster than America or Britain's, some of the new wave of "reverse migrants" are seeking opportunities as well as a cultural connection.

237 Which one of the following is an assumption on which this argument depends?

- A** People migrate to countries whose economic growth offers better opportunities
- B** Fast developing countries are attracting more and more people from abroad
- C** Migrants' children would rather move back to their country of origin than live where they parents settled
- D** Migrants from all over the world prefer moving to the East rather than to the West
- E** Cultural connection with the place of origin is deemed to be more important than opportunities originated by economic growth

Read the following passage and answer the given question.

On a sunny morning in 1966 two US Air Force planes collided and dropped four nuclear bombs near the village of Palomares in southern Spain. There was no nuclear blast, but plutonium was scattered over a wide area - and Spain is now asking the US to finish the clean-up. (October 2012)

238 Which one of the following can be drawn as a conclusion from the above passage?

- A** The US haven't done anything so far to decontaminate the area
- B** The US cannot guarantee they will finish the decontamination by the end of the year
- C** Spain and the US are working together to decontaminate the area
- D** The decontamination of the area by the US has been taking about 50 years
- E** The decontamination of the area by Spain has been taking about 50 years

Read the following passage and answer the given question.

Millions of people are using Android apps that can be tricked into revealing personal data, research indicates. Scientists tested 13,500 Android apps and found almost 8% failed to protect bank account and social media logins. These apps failed to implement standard scrambling systems, allowing "man-in-the-middle" attacks to reveal data that passes back and forth when devices communicate with websites.

239 Which of the following are underlying assumptions of the above argument?

- 1. Personal data are passed only when using Android apps.**
 - 2. Connecting to one's personal accounts on websites means to communicate personal data.**
 - 3. Bank accounts don't offer safe scrambling systems.**
- A** 1 only
 - B** 1 and 2 only
 - C** 1 and 3 only
 - D** 2 and 3 only
 - E** 2 only

240 Mark has got three red hats and two white hats. He invites John, Mike and Tom to play a game. He blindfolds them and invites them to take a seat so that they can see one another. He puts a hat on their heads so that any of them can see the others' hats but his own. Mark hides the two remaining hats and uncovers his friends. Finally, he asks each of them to find out the colour of his own hat. Neither John nor Mike can answer. Tom:

- A** is sure he wears a red hat, even blindfolded
- B** is sure he wears a white hat, even blindfolded
- C** can't answer, even uncovered
- D** can answer only after seeing his friends' heads
- E** is not sure whether he wears a red hat

241 60% of the people registered in a sports centre do swimming and 70% play tennis. The total people registered in the sports centre are 200; how many of them do both swimming and tennis?

- A** 30
- B** 40
- C** 80
- D** 130
- E** 60

Read the following passage and answer the given question.

To many French people the English are les rosbifs - a people unhealthily obsessed by roasting cows. That, and fish and chips and a few messy puddings and you have the extent of the UK's culinary repertoire. But something is changing across the Channel. People are buying British. Stilton and cheddar are making inroads in a land where camembert, brie and roquefort are national symbols on a par with Shakespeare in the UK. Scotch whisky now accounts for half a billion pounds in exports to France. Real ale is on the march, and sparkling wine from Sussex and Kent is winning awards, and prompting comparisons with champagne.

242 Which one of the following, if true, weakens this argument?

- A** The French still believe the English have no enviable culinary repertoire but for a few products
- B** The British food is more expensive to the French than their national products
- C** The production of French national cheese has considerably fallen
- D** The French food industry is investing on new products
- E** The English feel that they can compete with French food

Read the following passage and answer the given question.

The brains of teenage girls with behavioural disorders are different to those of their peer boys, UK researchers have found. The Journal of Child Psychology and Psychiatry study of 40 girls revealed differences in the structure of areas linked to empathy and emotions. Previous work has found similar results in boys. Experts suggest it may be possible to use scans to spot problems early, then offer social or psychological help.

243 Which one of the following, if true, weakens this argument?

- A** The origin of behavioural disorders lies in the structure of the brain
- B** A teenager's family and cultural background too can play a role in causing behavioural disorders
- C** A teenager's need of psychological help depends on the results of scans
- D** If the origin of behavioural disorders lies in the structure of the brain then parents could neglect their education
- E** Social and psychological help can be given only according to the results of scans

244 Although it is sometimes suggested that the congestion caused by the bunching of cars on motorways could be eased by increasing the speed limit to 150 km/hr, such an increase would not be a good thing. An estimated 35 per cent of drivers exceed the speed limit by 20 km/hr and would continue to do so if the limit were raised. Since bunching is caused by speeding drivers trying to pass those who observe the speed limit, raising the limit to 150 km/hr would result in the same amount of congestion, but at an increased speed. Moreover, a higher speed limit would encourage all drivers to drive faster, and thus would increase the existing danger from those who drive too close to the car in front.

Which one of the following best expresses the main conclusion of the above argument?

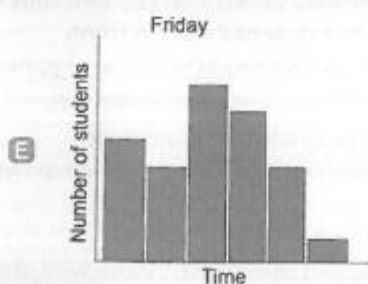
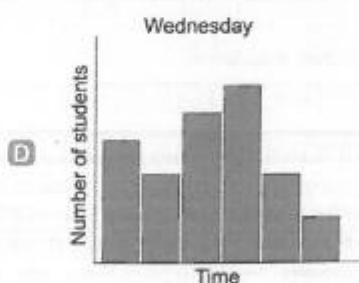
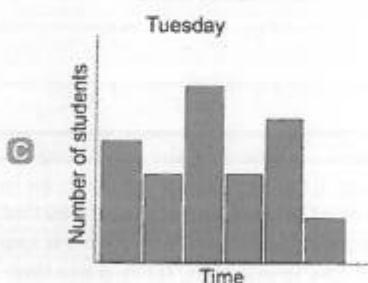
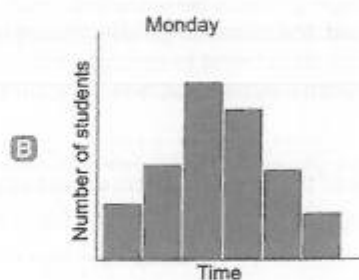
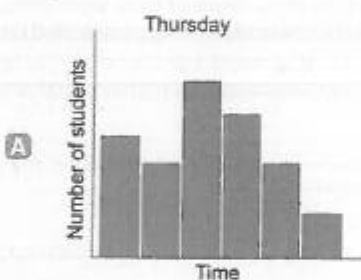
- A** Raising the speed limit to 150 km/hr would not reduce congestion on motorways.
- B** A higher speed limit on motorways would encourage all drivers to drive faster.
- C** An increase in the speed limit would increase the existing danger from those drivers who drive too close.
- D** It would not be a good thing to increase the speed limit to 150 km/hr.
- E** Congestion on motorways is caused by speeding drivers trying to pass those who observe the speed limit.

- 245 The table below shows the number of students visiting a college cafeteria at different times on a particular weekday.

Time	Number of students
10:00-11:00	43
11:00-12:00	35
12:00-13:00	63
13:00-14:00	54
14:00-15:00	34
15:00-16:00	17

The following bar charts show the number of students in the cafe for all five days in a given week.

Which day of the week does the data in the table above represent?



Find the diagram that represents the relationship among the three sets given in each exercise.



Diagram 1

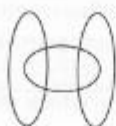


Diagram 2

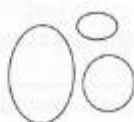


Diagram 3



Diagram 4



Diagram 5

246 Trees, oaks, pines.

- A Diagram 1
- B Diagram 2
- C Diagram 3
- D Diagram 4
- E Diagram 5

247 Wooden objects, steel objects, boxes.

- A Diagram 1
- B Diagram 2
- C Diagram 3
- D Diagram 4
- E Diagram 5

248 Cigars, smokers, drug-stores.

- A Diagram 1
- B Diagram 2
- C Diagram 3
- D Diagram 4
- E Diagram 5

249 Artists, Americans, blue-eyed people.

- A Diagram 1
- B Diagram 2
- C Diagram 3
- D Diagram 4
- E Diagram 5

250 Sportsmen, football players, born in United Kingdom.

- A Diagram 1
- B Diagram 2
- C Diagram 3
- D Diagram 4
- E Diagram 5

Read the following passage and answer the given question.

There are many good reasons to show your dog that he is part of your family by giving him access to your home, but the case isn't as compelling for letting dogs into your bedroom. There is even a good argument, with studies to back it up, that keeping your bedroom pet-free is better for the quality of your sleep. In addition, a pet-free sleeping area helps with any allergies you or your family members may have.

251 Which one of the following is the best assumption on which this argument depends?

- A** Lots of people have pets in their family
- B** Many people wouldn't let their pets into their bedroom
- C** Many people wouldn't dream of kicking their pets off the bed
- D** Very few people suffer from allergies
- E** Some cats can cause allergies

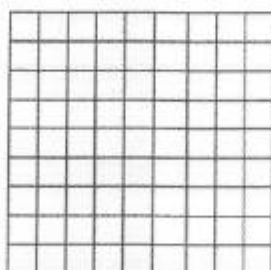
252 Which number completes the following series:

3 - 20 - 13 - 24 - 53 - 28 - ?

- A** 103
- B** 153
- C** 173
- D** 203
- E** 213

253 In a fairground game, participants roll discs onto a flat sheet marked out with squares. The players pay f1 per disc and if it comes to rest not touching a line they receive f2. If the centre of the disc lies more than its radius from the edge of the square (i.e. within the shaded area) the player will win.

[Diagram not to scale.]



Enlarged view of one square with disc rolled onto it



Assuming the lines between the squares are very thin, if the squares are 5 cm on each side and the disc has a radius of 1.5 cm, what percentage of the takings will the stallholder retain as profit?

- A** 2%
- B** 16%
- C** 4%
- D** 32%
- E** 68%

254 Four people out of six (A, B, C, D, E and F) are wearing a black sweater and two out of six are wearing a white sweater. In addition:

- A's sweater is different from C's
- E's and F's are the same colour
- B's is different from D's
- A's and B's are the same colour
- D's and E's are the same colour

What can you infer?

- A** D's sweater is black and C's sweater is white
- B** A's and B's sweaters are black
- C** E's and F's sweaters are white
- D** A's and C's sweaters are the same colour
- E** F's is black and B's is white

255 Find the missing number:

32, 8, 12, 48, 12, 16, 64, 16, ?

- A** 32
- B** 20
- C** 23
- D** 12
- E** 18

Read the following passage and answer the given question.

More and more, American cars are resembling those purchased in Europe. Considering that American drivers are facing some of the same factors that for years have shaped auto markets abroad - high gas prices, regulations mandating better mpg - the shift toward smaller, more fuel-efficient cars makes perfect sense. Slowly but surely, automakers have come to the realization that small economy cars will sell well in the U.S., and even be good profit-makers, just as they are in overseas markets.

256 Which one of the following best expresses the conclusion of this argument?

- A** American automakers will possibly export their small economy cars to Europe
- B** Fuel prices are likely to remain so and automakers are not sure whether small economy cars will sell in the US as much as in Europe
- C** Automakers will analyze overseas markets to make certain that small economy cars can sell well in the US
- D** If fuel regulations become more and more demanding the production of small economy cars may be interrupted
- E** If fuel prices keep on rising the trend of producing small economy cars will possibly continue

257 Fill in the blank to complete the proportion.

Start : engine = switch on : _____

- A** night
- B** fire
- C** switch
- D** light
- E** flight

- 258** The death rate in car accidents involving drivers in the first year after passing their test is far higher than that of older drivers. Analysis of those caught on camera who are exceeding the speed limit shows that new drivers generally drive faster than any other category of motorist. The government should pass a law placing a limiter on cars belonging to new drivers so that they cannot exceed 80 km/h for the first two years after their test. This would mean that there would be a dramatic reduction in the number of deaths of young drivers.

Which one of the following is an underlying assumption of the argument above?

- A** The reaction times of younger drivers are better than those of older drivers.
- B** Older drivers have developed more driving skills than younger drivers.
- C** The police target young road users when trying to catch speeding motorists.
- D** Younger drivers tend to drive cars with more powerful engines.
- E** A large percentage of deaths of young drivers is caused by speeding.

Read the following passage and answer the given question.

Genetic tests have been around for years, but in 2003 scientists took the field a step further, announcing the first complete mapping of a human genome - an entire genetic code. Sequencing, or "reading," a person's genome is one of the newest, most controversial tools in the medical arsenal because of the mother lode of information it contains about future disease risk. Genetic markers for heart disease or cancer may spur consumers toward healthier behaviour. But when it comes to conditions such as Alzheimer's and Parkinson's that can't be prevented, many experts are divided on whether knowing is helpful or harmful.

- 259** Which one of the following is an assumption on which this argument depends?

- A** Reading someone's genome will surely prevent any condition or disorder
- B** Reading someone's genome can help prevent any condition or disorder
- C** Researchers should find a therapy for Alzheimer's and Parkinson's conditions
- D** A healthy behaviour doesn't depend on knowing one's genome
- E** In some cases to ignore one's predisposition is better than to know it

- 260** Fred has four daughters - Ann, Barbara, Chris, Dolly. Two of them are blond-haired and two are dark-haired. In addition:

- if Ann is blond-haired, Chris is blond-haired too;
- if Barbara is blond-haired, Dolly is dark-haired;
- if Chris is blond-haired, Dolly is blond-haired too.

What can you infer?

- A** Ann and Chris are dark-haired and Barbara and Dolly are blond-haired
- B** Barbara and Chris are dark-haired and Ann and Dolly are blond-haired
- C** Ann and Barbara are dark-haired and Chris and Dolly are blond-haired
- D** Barbara and Dolly are dark-haired and Ann and Dolly are blond-haired
- E** Ann and Barbara are blond-haired and Chris and Dolly are dark-haired

- 261** A chocolate cake mixture is made from flour, sugar and chocolate powder. If $\frac{1}{4}$ of the mass of mixture is chocolate powder, and $\frac{1}{5}$ is sugar, and the remainder is 990 g of flour, what is the total mass of the cake mixture?

- A** 1500 g
- B** 1800 g
- C** 2000 g
- D** 2200 g
- E** 4950 g

- 262 I want to provide hot soup at a meeting that involves 35 people. I am only going to make one flavour of soup so that we do not waste time deciding who would like what flavour if I were to provide a choice. Some of the group are vegetarian, so I must remember this when I buy the soup. The following table shows the packs on sale at my local shop.

Flavour of soup	Number of servings per box	Price per box
Tomato	4	€1.00
Mushroom	10	€2.20
Chicken and vegetable	12	€2.10
Vegetable	12	€2.60

What is the least amount that I need to pay for the soup?

- A €6.30
- B €7.80
- C €6.60
- D €8.80
- E €9.00

- 263 Which number completes the following series:

1 - 125 - 5 - 110 - 25 - 95 - 125 - ?

- A 1
- B 75
- C 5
- D 25
- E 80

Read the following passage and answer the given question.

Large hyena populations are living alongside human communities in Africa without coming into conflict. An international team of scientists surveyed the population size and diet of spotted hyenas in northern Ethiopia. The study found a large hyena population with a diet that consisted almost exclusively of domestic animals. Humans and hyenas are able to coexist because the cost of livestock predation to the local people is relatively low.

- 264 The passage provides information that helps to answer which of the following questions?

- A Can hyenas cause any harm to humans?
- B Which animals do hyenas predate best?
- C Do hyenas' predation of domestic animals cause any damage to northern Ethiopia's communities?
- D How long have humans and hyenas been coexisting in northern Ethiopia?
- E Can large hyena populations cohabit with other animals in Ethiopia?

- 265 In ancient Rome 6000 workers were employed to build an aqueduct. Later, 8000 workers working at the same rate could build three more aqueducts in 18 years. How long did it take the 6000 workers to build the first aqueduct?

- A 5 years
- B 6 years
- C 7 years
- D 8 years
- E 9 years

266 A blue T-shirt costs 15 Euros, a pair of sneakers costs 40 Euros and cotton-belt costs 25 Euros. Tracey spends exactly 105 Euros. Which of the statements below is/are correct?

- 1 She cannot have bought 3 pairs of sneakers
 - 2 She must have bought at least one pair of sneakers
 - 3 She must have bought at least one blue T-shirt
 - 4 If she has bought the three items, she must have bought fewer sneakers than belts
 - 5 None of the above is correct
- ☐ A 1 and 3
☐ B 2 and 4
☐ C 1, 3 and 4
☐ D 4
☐ E 5

Read the following passage and answer the given question.

Americans Robert Lefkowitz and Brian Kobilka won the Nobel Prize in chemistry for studies of protein receptors that let body cells sense and respond to outside signals. Such studies are key for developing better drugs. The Royal Swedish Academy of Sciences said the two researchers had made ground-breaking discoveries on an important family of receptors, known as G-protein-coupled receptors. About half of all medications act on these receptors, so learning about them will help scientists to come up with better drugs.

267 Which of the following are underlying assumptions of the above argument?

1. Any cell has protein receptors.
 2. Protein receptors responding to outside signals must be studied.
 3. The quality of drugs depends on how much we know about protein receptors.
- ☐ A 1 only
☐ B 1 and 2 only
☐ C 1 and 3 only
☐ D 2 and 3 only
☐ E 3 only

Read the following passage and answer the given question.

Happiness is directly related to how much money we make. So it shouldn't be surprising that our earnings also correlate with suicide rates. A new paper from the San Francisco Federal Reserve shows that, all else being equal, suicide risks are higher in wealthier neighbourhoods, a morbid demonstration of the folly of trying to "keep up with the Joneses." For two individuals with the same income but living in two different counties, the one who lives in the county with a higher average income is 4.5% more likely to commit suicide. At first it might seem surprising, but it begins to make sense when you think about how we tend to compare ourselves to those around us.

268 Which one of the following is an assumption on which this argument depends?

- ☐ A Personal fulfilment depends more on our comparison with the others than on what we feel we are
☐ B Personal fulfilment depends more on what we feel we are or have than on our comparison with the others
☐ C Suicide rates are higher among the wealthy
☐ D Suicide rates are higher among the poor
☐ E Personal income should depend on the personal merit

269 Replace X and Y to complete the proportion.

Subject : independent = X : Y

- A X = simple; Y = easy
- B X = wet; Y = dry
- C X = warm; Y = summer
- D X = dependent; Y = employed
- E X = fast; Y = quick

270 Sometimes, smoking is actually better for the health than non-smoking. A study by the University of Melbourne has shown that smoking can lead to a diminished appetite. So those patients who quit smoking are at increased risk of gaining weight, which is particularly dangerous for patients with heart disease. In addition, nicotine plays an important role as a digestion stimulant. A study by the University of London has shown that 17% of patients have constipation problems when trying to quit cigarettes. In addition, psychologists suggest that some of their patients experience increased levels of stress while trying to quit smoking, which can be dangerous for people with high blood pressure. Therefore, one may conclude that in some situations smoking is better than non-smoking

Which one of the following is the best statement of the flaw in the above argument?

- A Only a very small number of patients who quit smoking might face serious problems.
- B Smoking may help diminish appetite, improve digestion and relieve stress.
- C Continuing smoking may be riskier than quitting.
- D Some smokers may not gain weight after they quit smoking.
- E If people were more careful with their diet and stress they would have fewer problems with quitting smoking.

271 In a bag there are 8 mint candies and 2 fruit candies. How many fruit candies do you need to add to have 1 possibility out of 3 to draw a fruit candy?

- A 4
- B 6
- C 5
- D 2
- E 3

272 Ulrich, Ana and Richard are studying to pass a university exam. If the single chance of the three to pass the exam is 60%, 40% and 50%, which is the chance that all of them will pass the exam?

- A 12%
- B 150%
- C 30%
- D 6%
- E It cannot be determined

273 Fill in the blank to complete the proportion.

Coach : team = _____ : students

- A mister
- B manager
- C cooker
- D teacher
- E officer

Read the following passage and answer the given question.

The health benefits of tea stretch across the spectrum - green, black or white all promise to fight free radicals and hydrate you, among other benefits. But green tea may have the advantage on one front: It's less processed and therefore the good guys (antioxidants, in particular one variety called EGCG) are more concentrated. Now, new clues are emerging as to just how powerful green tea really is. It's long been linked to fighting cancer, but researchers presented new evidence about how green tea prevents or slows the growth of prostate and breast cancers.

274 According to the information given, researchers found a relation between which of the following?

- A** Green tea and black tea
- B** Green tea and antioxidants
- C** Prostate cancer and breast cancer
- D** Antioxidants and cancer
- E** Prevention and treatment

275 Andrew, Dave, John and Luke are sitting in a four-man bob, one behind the other. If Andrew is sitting in the front seat, Dave will be sitting in the back seat (fourth position) and John in the third seat. If Andrew is not sitting in the front seat, Dave will be sitting in the second seat and Luke in the third. If Dave is sitting in the back seat, Luke will be sitting in the front seat.

According to the information given:

- A** John is sitting in the third seat and Luke in the second seat
- B** Luke is sitting in the second seat and Dave in the back seat
- C** John is sitting in the front seat and Luke in the third seat
- D** Andrew is sitting in the front seat and Dave in the back seat
- E** Luke is sitting in the front seat and Andrew in the back seat

Read the following passage and answer the given question.

Anti-social behaviour in some children could be the result of their genetic make-up, a study says. UK research on twins suggests children with early psychopathic tendencies, such as lack of remorse, are likely to have inherited it from their parents. These young children may also display inherited anti-social behaviour, the Institute of Psychiatry team found. But environmental factors are also important and, if favourable, could act as a buffer, they stressed.

276 Which one of the following is an assumption on which this argument depends?

- A** Children can inherit their parents' behaviour
- B** Environmental factors can affect behaviour in children
- C** Twins behave in the same way
- D** Anti-social behaviour in children is always inherited
- E** Psychopathic tendencies in children are always inherited from parents

277 In a group of 75 people there are 15 women. What is the percentage of men?

- A** 30%
- B** 150%
- C** 20%
- D** 70%
- E** 80%

- 278 The table below shows the average mass of the cerebellum, which is a part of the brain, and total body mass, for a number of animal species. The cerebellum of a cat has an average mass of 5.3 g, while a cat's average body mass is 3.5 kg.

Species	Cerebellum mass (g)	Body mass (g)
Mouse	0.09	58
Pigeon	0.4	500
Squirrel	1.5	350
Rabbit	1.9	1800
Dog	6.0	3500

For which of the species shown is the ratio of cerebellum to total body mass closest to that of the cat?

- (A) Mouse
- (B) Dog
- (C) Pigeon
- (D) Rabbit
- (E) Squirrel

Read the following passage and answer the given question.

One of the most powerful ways to make someone feel disgusted is with a foul odour. In the lab we have used this successfully to show these foul odours can induce disgust and this disgust can change the way that people perceive and judge others around them. When they have this disgust emotion they are more punitive and more negative towards strangers or individuals that they are judging.

- 279 According to the information given, researchers found a relation between which of the following?

- (A) Emotion and odour
- (B) Sight and judgement
- (C) Odour and disgust
- (D) Disgust and taste
- (E) Odour and judgement

Read the following passage and answer the given question.

Australia is searching for a new aircraft landing site in Antarctica because the current runway is melting due to global warming. Only a fraction of the planned flights have been able to land at the multi-million dollar facility which is there to re-supply scientific bases in Antarctica. As the authorities look for an alternative, they are having to turn to Chinese ships for help.

- 280 Which one of the following identifies the flaw in this argument?

- (A) It ignores that global warming may cause difficulty in finding a new definite aircraft landing
- (B) It ignores that Chinese ships may not want to help
- (C) It assumes that scientific bases in Antarctica must be re-supplied
- (D) It assumes that most of the flights are not able to land
- (E) It suggests that ships can be an alternative to flights

- 281** Three couples - Charles and Phoebe, John and Sheila, Vins and Mary - are travelling in Scotland by a six-seat van (driver included). In the van there is one seat at the left side of the driver, three back seats and one seat behind the three back seats.

In addition:

- Phoebe, who can't drive, suffers from air sickness and must sit close to the driver; the driver is not Vins;
- John is married with Sheila and is sitting close to her;
- the three men are sitting one behind the other.

According to the information given, it can be inferred that:

- A** John is the driver
- B** Vins is sitting behind the driver
- C** Sheila is sitting close to Vins
- D** Mary is sitting just behind Phoebe
- E** Vins is the driver

Read the following passage and answer the given question.

Voters in Switzerland have rejected a total ban on smoking in enclosed public places at a referendum. Although Geneva voted slightly in favour, results from the country's other 25 cantons showed a majority of voters rejected a full ban. Hotels, restaurants and bars are allowed rooms for smokers but critics say workers' health is at risk. Restrictions introduced two years ago were watered down after lobbying from the catering trade and tobacco firms. In some cantons, more than 70% of voters rejected the ban, according to Geneva newspaper «La Tribune de Genève». Geneva itself bucked the trend by supporting the ban by 52% to 48%.

- 282** The passage provides information that helps to answer which of the following questions?

- A** What sort of restrictions to smoking will be introduced?
- B** Did voters in Geneva confirm the general trend in the country?
- C** Why is the ban necessary?
- D** Are the Swiss going to reject the ban?
- E** Will the ban affect the habits of the Swiss population?

- 283** The Governor of California has recently announced that pupils will soon be learning only from digital texts, and experts in the UK said yesterday that the paperless classroom was becoming a reality here too. Although some educational publishers already offer a range of online resources, most of them are little more than electronic versions of the paper book. Books also offer something that digital resources just can't replicate; you can flick back and forth in them quickly and you can write in them. So the traditional textbook is not about to die a sudden death, especially not in the UK, where some children still do not have access to the internet at home and thus have every right to utter the postmodern excuse of not being able to download their homework.

Which one of the following best expresses the main conclusion of the above argument?

- A** Using digital texts gives students a good excuse to avoid doing their homework.
- B** Online resources offer educational publishers a new commercial opportunity.
- C** Ordinary textbooks are not about to vanish from the classroom.
- D** Books have important advantages over digital texts.
- E** The paperless classroom will become a reality in the near future.

The table below shows the unit sales of a particular super-computer in five European countries over a six month period. Use this information to answer the following questions.

Country	Jan	Feb	Mar	Apr	May	Jun	TOT
France	44	38	38	36	36	36	228
Italy	32	34	33	33	31	28	191
Spain	34	38	33	32	30	38	204
Germany	52	54	52	52	48	54	312
Uk	50	50	51	50	52	54	308
Total	212	214	207	203	197	210	1243

284 Approximately, what percentage of the overall total was sold in Italy?

- A 19%
- B 15%
- C 9%
- D 12%
- E 22%

285 Approximately, what percentage of the overall total was sold in the first quarter (Jan-Mar)?

- A 25%
- B 35%
- C 40%
- D 50%
- E 60%

286 Which month showed the biggest increase in total sales from the previous month?

- A February
- B March
- C April
- D May
- E June

287 Approximately, what percentage of the monthly total was sold to the biggest importer in March?

- A 12,5%
- B 15%
- C 20%
- D 25%
- E 30%

288 What is the average number of units per month sold in Italy over the first four months of the year?

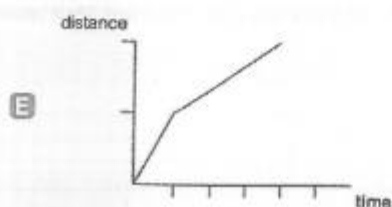
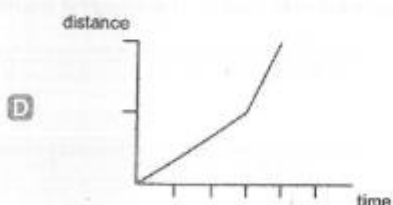
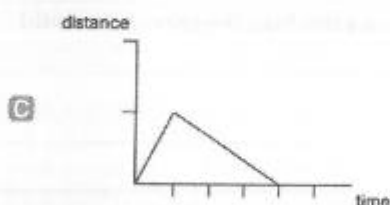
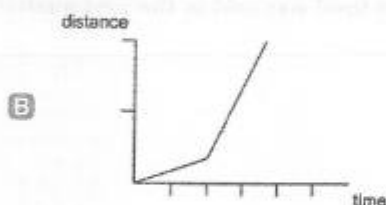
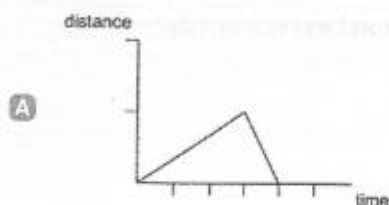
- A 32
- B 33
- C 34
- D 35
- E 36

289 Replace X and Y to complete the proportion.

X : to exhaust = Y : to compensate for

- A X = To wear out; Y = to make up for
- B X = To tell off; Y = to fix up
- C X = To wear; Y = to supply with
- D X = To get into; Y = to get at
- E X = To put down; Y = to put up

290 Leroy cycles to work each morning. The first half of his journey is uphill and he can manage only a steady 5 kilometres per hour. The second half, however, is downhill and he covers this at 15 kilometres per hour. Which one of these graphs could show Leroy's journey?



Read the following passage and answer the given question.

Zepko is an idyllic, undeveloped location in the eastern corner of Halkidiki, a peninsula in northern Greece blessed with secluded beaches, azure waters and pine forests. When Zepko's owners, all retired military officers, started looking for a buyer, two Russian companies came knocking. At a time when foreign and domestic capital is fleeing Greece, the Moscow- and St Petersburg-based companies submitted rival bids of 200m euros (£163m; \$260m) each to acquire the land and turn it into a luxury holiday resort. The officers could pocket 40m euros for the land alone if the deal goes ahead.

291 Which one of the following is an assumption on which this argument depends?

- A** The only present investors in Greek locations are foreigners
- B** It's hardly surprising that current investors in Greek locations are foreigners
- C** It was certain that some Russian companies would submit their bids to acquire the Greek location
- D** Zepko is not an ideal location for a luxury holiday resort
- E** Zepko's owners were just looking for some Russian buyers

292 Find the opposite of the word given.

Smooth

- A** Regular
- B** Even
- C** Rough
- D** Dirty
- E** Cold

293 Whenever I complete a level on my computer game I am given a five-letter password which I must enter next time I play the game so that I can bypass levels previously completed.

Late last night I hastily wrote down the latest password on a piece of scrap paper that was lying around. This morning I found that someone had tidied up. I cannot remember the password, and, sifting through the waste-paper basket, all I can find is this piece:

NOV

Which one of the following words CANNOT be the password?

- A** KNOLL
- B** LIONS
- C** PLONK
- D** NOISE
- E** ONION

294 Some friends are sharing some sweets among them. They take six sweets each and there remain only four. Mary gives her sweets back so that they are added to the remaining four. They share out again and receive 8 sweets each - Mary receives none - and there's no one left. How many people are there and how many sweets have been shared out?

- A** 5 people and 40 sweets
- B** 6 people and 40 sweets
- C** 6 people and 48 sweets
- D** 5 people and 34 sweets
- E** 6 people and 36 sweets

- 295** Mark, Pearl, Dolly, Andrew, Florence and Sarah are travelling on an eight-car train. Each one of them is on a different car. The front car is number 8 and the following cars are numbered from 7 to 1. Pearl is sitting the closest to the front car. Andrew is on car 4 and his car is half way between Pearl's car and Sarah's car. Dolly is on the car before Mark's. Car 3 is empty.

According to the information given:

- A** Mark is on car 6, Sarah is on car 2 and Florence is on car 5
- B** Pearl is on car 2, Florence is on car 7 and Dolly is on car 2
- C** Sarah is on car 8, Florence is on car 7 and Mark is on car 3
- D** Dolly is on car 5, Pearl is on car 2 and Mark is on car 3
- E** Florence is on car 2, Pearl is on car 7 and Dolly is on car 5

Read the following passage and answer the given question.

Psychologically speaking giving directions is a tricky task, because our minds find it difficult to appreciate how the world looks to someone who doesn't know it yet. We've all been there - the directions sounded so clear when we were told them. Every step of the journey seemed obvious, we thought we had understood the directions perfectly. And yet here we are miles from anywhere, after dark, in a field arguing about whether we should have gone left or right at the last turn, whether we're going to have to sleep here now, and exactly whose fault it is.

- 296** Which one of the following identifies the flaw in this argument?

- A** It assumes that we never know where to go
- B** It assumes that we are always in need of asking for directions
- C** It ignores that we may feel far from anywhere during daytime too
- D** It ignores how precise some people can be when giving directions
- E** It ignores that those who ask for a direction may have a plan

- 297** Five meetings are to be held in June. Each meeting will take place on Thursday. Which conditions must be respected in order to hold the meetings?

- A** June 8th must fall on Thursday
- B** June 2th must fall on Sunday
- C** June 1st must fall on Wednesday
- D** June 2nd must fall on Thursday
- E** June 10th must not fall on Thursday

Read the following passage and answer the given question.

Researchers have found some of the earliest signs of Alzheimer's disease, more than two decades before the first symptoms usually appear. Treating the disease early is thought to be vital to prevent damage to memory and thinking. Alzheimer's disease starts long before anyone would notice; previous studies have shown an effect on the brain 10-15 years before symptoms.

- 298** Which of the following can reliably be inferred from the results of the study?

- A** The earliest signs of Alzheimer's disease were discovered 10-15 years ago
- B** Memory and thinking are affected by Alzheimer's disease
- C** Doctors may not notice the moment when Alzheimer's disease starts
- D** Doctors may have less time to treat people
- E** Doctors may have more time to treat people

Read the following passage and answer the given question.

In the course of my life, I have loved and lost and sometimes won, and always strangers have been kind. But I have, it appears, been set on a life of single blessedness. And I haven't minded. But now I kind of do. Take dinner parties. There comes a moment, and that question: "Why don't you have a partner?" It is usually asked by one of a couple, with always a swivel of the eye to his or her other half, so really two people are asking this question. And I struggle to answer: "I have never found the right person... I am a sad and sorry manchild... I am incapable of love... I am a deviant, and prefer giraffes."

299 Which one of the following is an assumption on which this argument depends?

- A** Singles never wonder why they don't have a partner
- B** Singles usually wonder why they don't have a partner
- C** People never meddle in other people's business
- D** People usually expect other people to have a partner
- E** Singles are not supposed to go to parties

300 Five letters - A, B, C, D and E - indicate the angles of a pentagon having one acute angle:

- A** B indicates the acute angle
- B** C indicates the left angle adjacent to the E angle and it is not adjacent to the B angle
- C** D doesn't indicate an angle adjacent to the B angle

Following such information, it is true that:

- A** the D angle is adjacent to the E angle and the C angle
- B** the A angle is adjacent to the B angle and the D angle
- C** the E angle is adjacent to the C angle and the D angle
- D** the C angle is adjacent to the A angle and the E angle
- E** the B angle is adjacent to the D angle and the C angle

301 Find the missing letters: a, b, c, c, b, a, b, c, d, d, c, b, c, d, e, ?, ?

- A** f, e
- B** e, d
- C** d, e
- D** e, f
- E** d, f

302 Fill in the blanks to complete the proportion.

_____ : body = _____ : cornfield

- A** Surgeon, farmer
- B** Smith, caretaker
- C** Singer, actor
- D** Hairdresser, carpenter
- E** Surgeon, teacher

303 In a ten-car train, every single car has 11 sections. In each section there are 6 seats. If 132 seats are sold discounted, what percentage of seats are not discounted?

- A** 65%
- B** 20%
- C** 85%
- D** 15%
- E** 80%

Read the following passage and answer the given question.

Studies consistently show that sleep deprivation is linked to obesity and that heavier individuals tend to report more problems getting a good night's slumber. Now researchers at Johns Hopkins University School of Medicine report at the 2012 American Heart Association Scientific Sessions in Los Angeles that weight loss, either through diet or a combination of diet and exercise, can lead to better sleep.

304 Which one of the following is an assumption on which this argument depends?

- A** A good night's slumber is important for overweight people
- B** A good night's slumber is important for everybody
- C** Only those who are on a diet and do physical exercise sleep well
- D** Only overweight people have problems with sleeping
- E** Anyone having problems getting a good night's slumber should undergo a diet

305 Find the missing number:

19, 11, 44, 37, 148, 142, 568, ?

- A** 142
- B** 114
- C** 563
- D** 562
- E** 256

Read the following passage and answer the given question.

While euthanasia and assisted suicide are illegal in the UK, other countries, like Switzerland, do permit assisted suicide in specific circumstances - and Dignitas is the only Swiss facility to accept foreigners. For those who travel with them, there has always been the fear of prosecution but, to date, no-one who accompanied any of the 182 Britons has been prosecuted.

306 Which one of the following can be drawn as a conclusion from the above passage?

- A** In the UK anyone assisting terminally ill people willing to take euthanasia can be prosecuted
- B** In the UK anyone assisting terminally ill people willing to take euthanasia have always been prosecuted
- C** In the UK anyone assisting terminally ill people willing to take euthanasia cannot be prosecuted
- D** Switzerland is the only country in Europe whose facilities accept foreigners willing to take euthanasia
- E** Prosecution for assisting terminally ill people willing to take euthanasia is just a fear

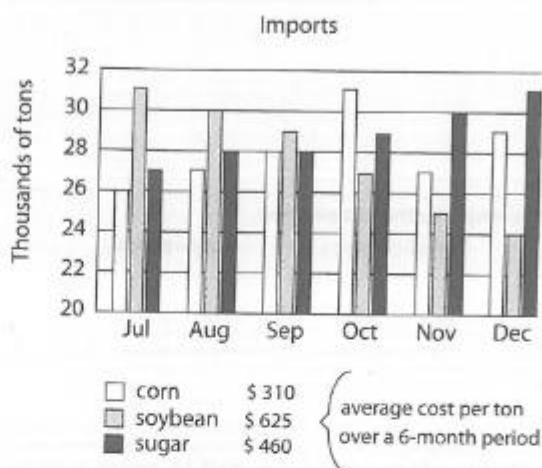
Read the following passage and answer the given question.

A Chinese man who served 11 years of a life sentence for fraud has received a record compensation payout. Huang Liyi's award of \$130,000 amounts to around \$30 for every day spent in prison. China's legal system has long been criticised by human rights groups for producing a high number of wrongful convictions and, for those on the receiving end of such rough justice, overturning a conviction is difficult. Hyang Liyi, from the southern city of Kaiping, had his appeals rejected numerous times before his conviction for cheque fraud was eventually overturned in 2010.

307 According to the information given what may have persuaded the Chinese's legal system to overturn Liyi's conviction?

- A** Liyi's team of lawyers
- B** Human rights groups' lobbying
- C** The UN's intervention
- D** The reforming of China's legal system
- E** The award to be given for every day spent in prison

Look at the following graph and answer the questions.



308 Which month showed the largest decrease in total imports over the previous month?

- A Aug
- B Sep
- C Oct
- D Nov
- E Dec

309 What was the difference (in thousands of tons) between sugar and corn imports in the last 3 months of the year?

- A 1
- B 2
- C 3
- D 4
- E 5

310 What was the total value of soybean (in \$) imported over the six-month period?

- A 52,080
- B 79,580
- C 89,320
- D 103,750
- E 121,350

311 What was the approximate ratio of corn to soybean in the last 4 months of the year?

- A 19:18
- B 8:6
- C 7:9
- D 15:13
- E 23:21

312 Find the missing number:

100, 91, 83, 76, 70, 65, ?

- A 63
- B 61
- C 58
- D 51
- E 56

313 Fill in the blanks to complete the proportion.

Policeman : _____ = baywatch : _____

- A city, mountain
- B beach, street
- C street, beach
- D winter, summer
- E snow, sun

314 Barbara needs to decide which one of her staff to award a bonus to this year. She has decided that the bonus should not go to anyone who has been late to work more than three times or who has failed to complete a task by the deadline set more than twice. She will give the bonus to whichever of the remaining staff has completed the most tasks. The data for her staff is given below:

Staff Member	Days sick	Days late	Performance		Number of years working with the company
			Tasks completed	Tasks completed by deadline	
Alex	3	2	54	50	4
Brian	2	3	57	54	2
Cynthia	5	1	48	47	6
Daphne	1	5	59	59	5
Edward	2	2	53	52	3

Which member of staff should receive the bonus?

- A Alex
- B Brian
- C Cynthia
- D Edward
- E Daphne

315 Six friends are going to the restaurant together: Angela, Giovanni, Luca, Osvaldo, Sara and Valentina.

- Osvaldo married Angela, who's Giovanni's sister.
- Sara, a friend of Osvaldo's, married Luca, who's Valentina's brother.
- Valentina is Giovanni's wife.

According to such information, which of the following statements is false?

- A Sara is Valentina's sister-in-law
- B Angela and Valentina are sisters-in-law
- C Luca is Angela's brother-in-law
- D Giovanni and Osvaldo are brothers-in-law
- E Angela is Osvaldo's wife

316 Find the opposite of the word given.

Noisy

- A Untidy
- B Large
- C Small
- D Natural
- E Quiet

- 317** Alberto has decided to paint his dining room. Paint comes in 1 litre cans. The paint in one can will cover an area of approximately 24 square metres. The dining room is 4 m x 6 m x 3.5 m high. There is just one window which is in one of the long walls and is 1.5 m x 2 m. All of the walls, door and ceiling are to be painted with the same type of paint. Approximately 20% of the wall area to be painted is wood which will need a second coat of paint. What is the minimum number of cans of paint that Alberto should buy to have sufficient to complete the room?

- A 2 cans
- B 3 cans
- C 5 cans
- D 4 cans
- E 6 cans

- 318** Four red marbles, three black marbles and two green marbles are placed in a white box and the box is vigorously shaken. You draw out a red marble first and then a black marble. You do not replace either ball. Which one of the following statements is true?

- A At least one of the next three marbles must be black
- B The next marble will definitely be red
- C The next two marbles cannot both be green
- D You must draw out at least 6 marbles to be sure you have a green marble
- E At least one of the next three marbles must be red

Read the following passage and answer the given question.

Appetite suppressants are a variety of drugs and plant products used to curb appetite. In the past phenylpropanolamine (PPA) was used as an ingredient in many over-the-counter weight loss products, but following adverse reports of links to haemorrhagic stroke with these products, Yale University scientists discovered that PPA does increase the risk of haemorrhagic stroke in women (and possibly men). Consequently, the Food and Drug Administration recommended that consumers not use any products that contain PPA and ruled that PPA is not considered safe for nonprescription use. As a result the FDA is in the process of removing PPA from all drug products and has requested that all drug companies discontinue marketing products containing PPA.

- 319** Which of the following are underlying assumptions of the above argument?

1. PPA are dangerous.
2. The FDA is responsible for protecting and promoting public health.
3. Drug companies should market safe products.

- A 1 only
- B 1 and 2 only
- C 1 and 3 only
- D 2 and 3 only
- E 1, 2 and 3

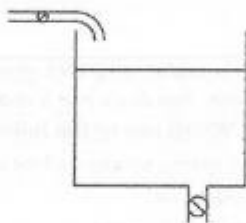
Read the following passage and answer the given question.

Parental involvement - checking homework, attending school meetings and events, discussing school activities at home - has a more powerful influence on students' academic performance than anything about the school the students attend. The effort put forth by parents (reading stories aloud, meeting with teachers) has a bigger impact on their children's educational achievement than the effort expended by either teachers or the students themselves.

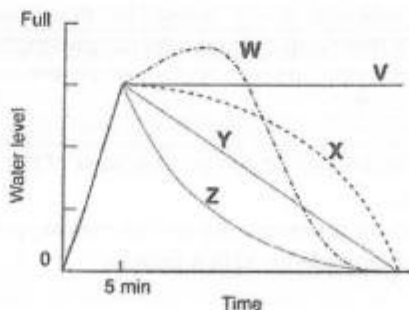
320 Which one of the following identifies the flaw in this argument?

- A It assumes that orphans could never have a good school performance
- B It assumes that parents are as important as teachers
- C It ignores how hard it is to study
- D It ignores that parents work most of the time
- E It assumes that teachers are not good workers

321 A farmer's water tank is filled from a tap. There is a valve at the bottom of the tank which lets water out.



The rate at which water can flow out through the valve (when it is open) increases with the depth of water in the tank. When the tank is almost empty, the rate at which water can flow out through the bottom just matches the rate at which water comes into the tank from the tap at the top. One day, the farmer shuts the valve at the bottom and starts filling the tank. He fills it for five minutes, by which time it is three-quarters full, but then, without noticing, he knocks the valve at the bottom open.



Which line on the graph above best represents what happens to the level of water in the tank?

- A Line W
- B Line Y
- C Line X
- D Line Z
- E Line V

- 322 Four boys are helping to clear bricks from some wasteland so that a playground can be made. They will be rewarded based on the number of bricks they manage to find. They can carry 12 bricks at a time in a special holder. In the final round of collecting, three of the boys have filled their holders but the fourth hasn't found enough bricks to do this. In order that they all receive the same reward, the first three boys each give two bricks to the fourth boy. How many bricks did the fourth boy have in his holder before the others gave him some of theirs?
- A 2 B 6 C 4 D 8 E 10

Read the following passage and answer the given question.

Social engineering is the act of manipulating a person or persons into performing some action. In the realm of computer abuse, this most commonly takes the form of, but is not limited to, convincing victims to divulge personal, financial, or security-related information or to grant access to computer systems or physical environments where such information is stored. Use of trickery and fraud is common in such attacks. Attacks can take place in person, over the phone, through the Internet (including email, instant messaging, and the like), through hard copy correspondence, or through any other means of communication.

- 323 Which one of the following can be drawn as a conclusion from the above passage?
- A Engineering is often meant to fraud people
 B Any form of communication may be meant to fraud people
 C The Internet is often meant to fraud people
 D The Internet is a means to manipulate people
 E Victims of social engineering always surf the Internet
- 324 Elena is organizing a dinner to celebrate her husband Paolo's birthday: she invites Stefano and his wife Loredana, Alessandro and his wife Claudia, Michele and his wife Franca. Which of the following conditions must be respected to let any man sit between two women and every woman sit between two men?
- A At the two heads of the table must sit either two women or two men
 B At the two heads of the table must sit a man and a woman
 C Paolo must sit close to his wife
 D Michele must sit close to Claudia
 E Stefano and his wife must sit one in front of the other

Read the following passage and answer the given question.

Following the end of slavery, there was a marked increase in lynchings, especially throughout the American South. Ida B. Wells Barnett, an African American who was an early leader of the antilynching movement, described lynching as a form of terror used by racist whites to maintain a caste system in the South.

- 325 Which of the following can reliably be inferred according to the information given?
- A Whites used lynchings to maintain control of all political, social, and economic institutions
 B Whites used lynchings though political, social, and economic institutions opposed to it
 C Whites didn't see African Americans as a political, economic, and social threat
 D The cast system in the South existed in spite of the racist whites
 E Slavery caused lynchings

326 Find the missing letters:

b, a, b, d, c, d, f, e, f, h, g, h, ?, ?

- A h, i
- B j, h
- C j, i
- D i, h
- E i, j

327 Agatha shares 70 postcards with her five children Allison, Amanda, Theodora, Harold and Ian. If she keeps 12 postcards for herself, how many postcards will Ian receive if every daughter receives 1 postcard more than every son?

- A 6
- B 8
- C 11
- D 12
- E 14

328 At the end of a labyrinth there are five doors. Only two of them are exit doors and they are not close to each other. Two non-exit doors are close to each other and the far right-side door is a non-exit door. Which door must be opened to exit the labyrinth?

- A The middle door
- B The far-left door
- C The second door on the right
- D The second door on the left
- E The far-right door

Read the following passage and answer the given question.

There is a widespread belief by the general public that advertising has powerful effects. This belief sometimes results in demands for the governmental regulation of advertising, especially regulations designed to protect certain groups (in particular, children) and to outlaw deceptive practices. Despite this belief in the power of advertising, economic time-series studies have found small or no effects of the amount a firm spends on advertising on either growth in market share or total product-category sales.

329 Which one of the following can be drawn as a conclusion from the above passage?

- A Exposure to advertisement causes many effects on the brain
- B Governmental regulation of advertising is urged by consumers
- C Children are the only to be protected from advertising
- D Fears for the power of advertising may not be justified
- E The power of advertising is proved by sales increase

330 Four friends want to take English lessons with the same teacher. Each of them wants to take three lessons and the teacher can do lessons only to two people at a time. How many lessons must be done so that each friend has taken three?

- A 8
- B 4
- C 5
- D 6
- E 3

Find the diagram that represents the relationship among the three sets given in each exercise.



Diagram 1

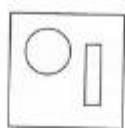


Diagram 2

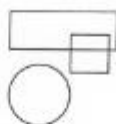


Diagram 3



Diagram 4

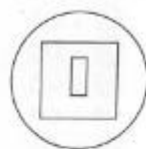


Diagram 5

331 Doctors, paediatricians, ambulances.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

332 Monitors, printers, mouses.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

333 Gardens, fat people, gardeners.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

334 Fiction books, dictionaries, books.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

335 Foods, vegetables, tomatoes.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

336 An instrument store gives a 10% discount to all students off the original cost of an instrument. During a back to school sale an additional 15% is taken off the discounted price. Julie, a student at the local high school, purchases a flute for \$ 306. How much did it originally cost?

- A** \$ 325
- B** \$ 375
- C** \$ 400
- D** \$ 408
- E** \$ 425

337 In bag 1 there are two red balls. In bag 2 there are one red ball and one blue ball. A boy draws at random one ball from bag 2 and, without looking at it, puts it into bag 1. Then the boy draws one red ball from bag 1. What is the probability that one of the remaining two is blue?

- A** $\frac{3}{4}$
- B** $\frac{2}{3}$
- C** $\frac{1}{2}$
- D** $\frac{3}{5}$
- E** $\frac{2}{5}$

Read the following problem and answer the questions.

Juliet, Roxane, Jennifer, Laura and Mary entered for a women's tennis tournament. Following the regulation, the players are to play twice one against the other. The score is: 2 (victory), 0 (defeat); tennis matches cannot end in a tie. After each player has played once against the other the placing is as follows:

- Laura scored 8;
- the girl who won second place scored 6;
- only Juliet has come forth;
- all the girls won one match at least but Jennifer;
- Mary beat Roxane.

338 What is Mary's score?

- A** 4
- B** 2
- C** 6
- D** 8
- E** 0

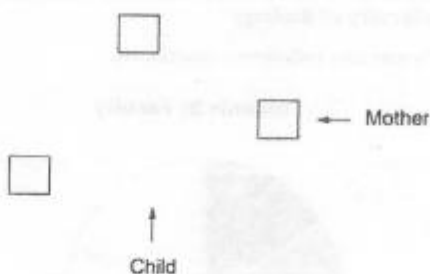
339 Who's third?

- A** Roxane
- B** Jennifer
- C** Mary
- D** Laura
- E** Juliet

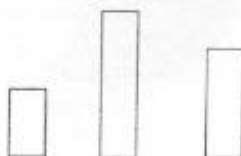
340 How many matches did Roxane win?

- A** 0
- B** 2
- C** 3
- D** 1
- E** 4

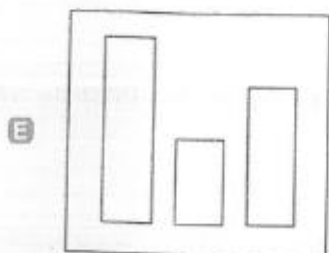
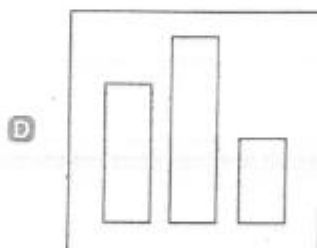
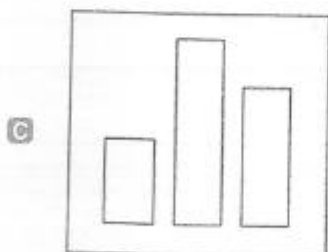
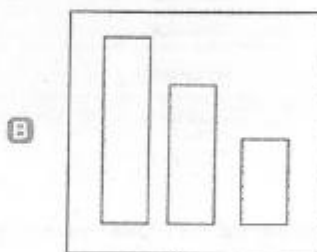
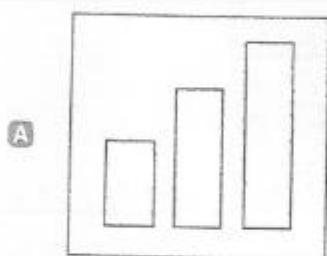
- 341 A child is building some towers using bricks. He has set them out on a mat as shown on the diagram below.



The view the child has from his side of the mat is shown below:

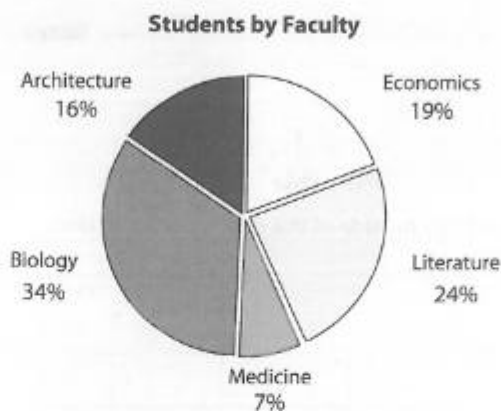


What would the view from the mother's position look like?



The pie chart below shows the percentage of students in each faculty of UK Alpha University; there are a total of 400 students in the faculty of Architecture. The table below shows the number of non-UK students in the faculty of Biology.

Use this information to answer the following questions.



No. of Biology Students (non-UK)	
Spain	22
France	18
Germany	35
Italy	29
Greece	15

342 How many students attend the Alpha University?

- A 2300
- B 1850
- C 2500
- D 2350
- E 1900

343 How many students attend the Faculty of Economics?

- A 175
- B 475
- C 325
- D 600
- E 560

344 What percentage of students attending the Faculty of Biology are non-UK students?

- A 28%
- B 25%
- C 23%
- D 21%
- E 14%

345 If 8% of Medicine students are from Germany, how many are the German students attending the Faculty of Medicine?

- A** 14
- B** 16
- C** 18
- D** 19
- E** 20

346 There are 12 Spanish Literature students. What percentage of the Faculty of Literature are they?

- A** 2%
- B** 3%
- C** 4%
- D** 5%
- E** 6%

Read the following passage and answer the given question.

Millions of people in the US have taken part in an earthquake drill to raise awareness of how to react if a huge quake was to hit. Scientists studying the San Andreas fault say a huge earthquake is long overdue in California. Dr Lucy Jones, a seismologist with the US Geological Survey, says people have to remember the risks: "We've had a rather quiet time in LA for the last 15 years, we haven't had a lot of big earthquakes, that's not going to last and so we need to have ways of getting people to think about it, take responsibility, because a lot of the damage is preventable."

347 Which of the following is the best statement of the flaw in the above argument?

- A** It assumes that raising awareness can help reduce damage in case of earthquake
- B** Very few people in the US have taken part in the earthquake drill
- C** People don't ignore the risks of a earthquake
- D** It assumes that the present quiet time in LA will last for long
- E** It ignores that the power of the earthquake can cause big damage regardless of people's awareness

Read the following information and answer the questions.

In a family there are five brothers (Mark, Daniel, George, Paul and Fred) and one sister (Sarah).

- 1) Paul is older than Fred;
- 2) Mark is the youngest;
- 3) George is older than Daniel who is the fourth brother;
- 4) Fred is older than George.

348 Which further piece of information makes you infer that Sarah is the second-born?

- A** Sarah is older than Fred
- B** Sarah is younger than Paul and older than Daniel
- C** Sarah is older than George and younger than Paul
- D** Sarah is younger than Paul and older than Mark
- E** None of these statements

349 According to statements 1), 2) e 3) which of the following can be inferred?

- I) George is younger than Paul
- II) Daniel is younger than Fred
- III) Mark is younger than George

- A** I)
- B** I) and II)
- C** I), II) and III)
- D** II) and III)
- E** II)

350 Find the missing number:

16, 14, 42, 45, 43, 129, 132, ?

- A** 130
- B** 134
- C** 138
- D** 66
- E** 126

351 Producing meat for consumption requires the breeding of livestock. Some people argue that the process of breeding involves animals being kept in very poor conditions with a low quality of life.

Since we should respect the right to a good quality of life for these animals as much as any person, we should abandon the consumption of meat and adopt a vegetarian lifestyle.

Additionally, the breeding of livestock produces greenhouse gases, so adopting a vegetarian lifestyle would assist the campaign against global warming.

Which one of the following best expresses the main conclusion of the above argument?

- A** We should respect animals' rights to a good quality of life.
- B** We should adopt a vegetarian lifestyle.
- C** Animals cannot be bred while preserving their quality of life.
- D** Becoming vegetarians will help us to combat global warming.
- E** If we become vegetarian then livestock breeders will go out of business.

352 Six people share a sum of money. If the same amount was to be shared among 5 people everyone would get 30 Euros more. The sum of money is equivalent to:

- A** 900 Euros
- B** 750 Euros
- C** 150 Euros
- D** 450 Euros
- E** 650 Euros

353 Find the missing letters:

a, m, b, m, c, m, d, m, e, ?, ?

- A** m, g
- B** f, m
- C** f, g
- D** g, m
- E** m, f

Read the following passage and answer the given question.

The new frontier of electronic banking is the online bank, where customers can access many banking functions via the Internet, including balance queries, transfers, automatic payments, and loan applications. For the consumer, online banking offers greater convenience and access to information than even the ATM, albeit without the ability to obtain cash. From the bank's point of view, online banking offers a new way to reach and serve customers while relieving the strain on the ATM hardware and network. However, use of the Internet increases vulnerability to hackers and raises issues of privacy and the handling of personal information similar to those found in other e-commerce venues.

354 Which one of the following, if true, weakens the argument about the advantages of online banking?

- A** The ATM hardware and network could allow access to as much information as online banking
- B** Online banking is convenient only to those who have got a personal computer
- C** Online banking doesn't allow to obtain cash
- D** The use of the Internet requires giving personal information
- E** The use of the Internet increases vulnerability to hackers and raises issues of privacy

Read the following information and answer the questions.

Four teams (Black, White, Blue, Red) entered for a football competition. Following the regulation, each team is to play twice against the others. The score is: 3 (victory), 0 (defeat) and 1 (tie). One month later each team has played only once:

- the White were never beaten;
- the Blue have drawn twice;
- the winning team scored 7 and it has a two-point lead on the second;
- the Black have finished last but one;
- the Black have drawn with the Red.

355 Which team finished last?

- A** Black
- B** White
- C** Red
- D** Blue
- E** It cannot be determined

356 What's the difference in score between the White and the Black?

- A** 7
- B** 2
- C** 5
- D** 6
- E** 4

357 What team is second?

- A** White
- B** Black
- C** Red
- D** Blue
- E** It cannot be determined

358 What's the difference in score between the first team and the last team?

- A** 4
- B** 5
- C** 2
- D** 1
- E** 6

359 If the Red score 3 points more, which will their final score be?

- A** 5
- B** 4
- C** 6
- D** 10
- E** 8

360 If the Blue lose all of the following matches and the White score 5 points more, what will the difference in score be between the two teams at the end of the competition?

- A** 12
- B** 7
- C** 6
- D** 8
- E** 4

Read the following passage and answer the given question.

Can you imagine wanting to know whether your newborn baby will fall victim to Alzheimer's disease decades down the road? What about cancer or diabetes? Emma Warin can. She agreed to participate in an unprecedented study in which researchers will map out every speck of DNA in her son's genome, potentially revealing mutations that could cause health problems now and far into the future. Warin, a medical-device sales representative in Falls Church, Va., says the information will help her plan ahead for any issues. Still, she adds, "It's a little scary."

361 Which one of the following identifies the disadvantages of mapping out the DNA?

- A** The worsening of life condition
- B** The difficulty detecting all predispositions to diseases
- C** The scare and influence on everyday life to prevent the potential diseases revealed
- D** The difficulty of mapping
- E** The cost of mapping

362 Angelo has got twice as many books as Fernando; Fernando has got one third of Michele's books; Michele has got four times as many books as Alessio.

The four friends have got 54 books altogether.

How many books have Michele and Alessio got respectively?

- A** 40 and 10
- B** 32 and 8
- C** 24 and 6
- D** 7 and 28
- E** 7 and 24

363 Find the opposite of the word given.

Brave

- A Knight
- B Cowboy
- C Coward
- D Bad
- E Fear

Read the following passage and answer the given question.

Most people don't give much thought to their blood group, unless they have an operation or an accident and need a transfusion. But in Japan, blood type - or ketsueki-gata - is an enormously popular way of defining temperament and personality, and has big implications for life, work and love.

364 Which one of the following, if true, weakens this argument?

- A Ketsueki-gata has no scientific foundations
- B Ketsueki-gata has scientific foundations
- C In Western countries people are going to give more and more importance to blood type
- D The Japanese don't think of their blood group but for understanding their temperament and personality
- E The Japanese should learn that life, work and love don't depend on one's blood type

365 Find the opposite of the word given.

Ashamed

- A Proud
- B Excited
- C Outgoing
- D Impassive
- E Astonished

366 Find the missing letters:

d, w, e, v, f, u, g, t, h, ?, ?

- A i, s
- B r, i
- C s, l
- D i, r
- E s, r

367 Three bottles of beer "A" cost twice as much as two bottles of beer "B" which cost three times as much as a bottle of beer "C". How much is a bottle of beer "A"?

(1) One bottle of beer "C" costs less than a bottle of beer "D"

(2) One bottle of beer "C" costs 3 euros

- A Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient
- B Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient
- C BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient
- D EACH statement ALONE is sufficient
- E Statements (1) and (2) TOGETHER are NOT sufficient

Read the following passage and answer the given question.

During the late 1950s and early 1960s, Carnaby Street, located in London's Soho district, was transformed when a group of 'youthquake' fashion designers, including John Stephen, Sally Tuffin and Marlon Foale, were attracted there by the combination of low rents and West End location. Carnaby Street rapidly became both stage and centre for the image conscious mods and the growing metropolitan gay culture. Reciprocally, this combined spending power attracted increasing numbers of designer retailers, notably Ian Gray's Gear Boutique and John Michael's Mod Shop. By the mid-1960s Carnaby Street, now popularly named 'Peacock Alley', had become an internationally recognized symbol of 'swinging London'.

368 The passage provides information that helps to answer which of the following questions?

- A** Did many gay people move to Soho district?
- B** Why did fashion designers choose to move to Carnaby Street?
- C** When was Soho district built?
- D** Were the hippies satisfied with their district in London?
- E** How was Carnaby Street popularly named during the late Fifties?

Read the following passage and answer the given question.

EU commissioners are due to debate proposals that would force quotas for women on corporate boards. EU Justice Commissioner is in favour of the proposals to make it mandatory for companies to reserve 40% of seats for women. But several countries, including the UK, are opposed to it.

369 Which one of the following is an assumption on which this argument depends?

- A** Men still occupy leading roles in private businesses
- B** Men occupy more leading roles in private businesses than in public businesses
- C** The EU is concerned with granting equal job opportunities to men and women
- D** The EU can take decisions despite the opposition of some countries
- E** The EU cannot take decisions despite the opposition of some countries

Read the following passage and answer the given question.

The Philippines is fast becoming the world's low-cost English language teacher - with rapid increases in overseas students coming to learn English or study in English-speaking universities. There might be other countries that people think about as a classic place to learn English, such as the UK, the US or Australia. But there is one key reason that they are switching to the Philippines. It's much cheaper. And in the competitive market for language students, it means the Philippines is attracting people from countries such as Iran, Libya, Brazil and Russia.

370 Which one of the following best expresses the conclusion of this argument?

- A** Much cheaper lessons and a convincing US accent are bringing a fast-increasing number of students to learn English in the Philippines
- B** The UK, the US and Australia are still considered to be classic places to learn English
- C** The UK, the US and Australia are no more considered to be the places to learn English
- D** Students from developing countries have political reasons for moving to the Philippines rather than to the UK, the US or Australia
- E** English can be learnt anywhere in the world

Read the following passage and answer the given question.

I have a paunch, but I hide it pretty well. Like lots of men, I collect calories in my belly - what scientists call the visceral region, my gut. It's easy to conceal: many ordinary men's shirts are pyramid-shaped, so they fit neatly at the shoulders and then billow a bit as they go south. But they can also hide a health problem: even if you're not overweight, having excess belly fat can lead to serious cardiovascular disease and other illnesses. In fact, as new research shows, those who have normal weight but concentrated "central" fat are more than 50% more likely to die earlier from all causes than those who are obese.

371 Which one of the following best expresses the conclusion of this argument?

- A** Common paunch is a risk factor associated with cardiovascular disease
- B** Obese people and those with central fat should undergo the same diet
- C** Those who have concentrated central fat have half the probability to die earlier than the obese
- D** Menswear is specifically designed to hide physical defects
- E** Men should learn to hide their bellies better

372 Find the opposite of the word given.

To rest

- A** To take
- B** To reach
- C** To close
- D** To bring
- E** To move

373 A pipe of length 120 inches is cut into three pieces of unequal lengths. What is the length of the longest piece?

(1) The combined length of the two longer pieces is 90 inches.

(2) The combined length of the two shorter pieces is 60 inches.

- A** Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient
- B** Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient
- C** BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient
- D** EACH statement ALONE is sufficient
- E** Statements (1) and (2) TOGETHER are NOT sufficient

374 Gabe lends his five friends - Colin, Luke, William, Fred and Henry - five books: a detective story, a novel, a comic, a history essay, an essay and an atlas (not necessarily in this order). The essay is the most expensive, the comic is the shortest, the atlas is the biggest. Henry borrows neither the biggest nor the most expensive nor the shortest book. Colin doesn't borrow the shortest book. Luke borrows neither the most expensive nor the shortest. Fred borrows the novel.

According to the information given:

- A** William borrows the comic and Colin borrows the essay
- B** Colin borrows the essay and Henry borrows the atlas
- C** William borrows the atlas and Colin borrows the essay
- D** Fred borrows the novel and Luke borrows the essay
- E** Henry borrows the comic and Colin borrows the essay

Find the diagram that represents the relationship among the three sets given in each exercise.

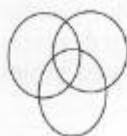


Diagram 1

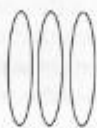


Diagram 2

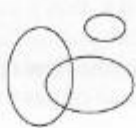


Diagram 3



Diagram 4



Diagram 5

375 Newspapers, journalists, Russians.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

376 Cutlery, knives, dishes.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

377 Movies, scripts, directors.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

378 Fruits, foods, golden apples.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

379 Teachers, married, people over 40.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

- 380** A building has both big and small apartments. 65 percent of the apartments are small. The number of occupied big apartments is twice the number of unoccupied small apartments. What percent of the apartments in the building are occupied?

(1) The number of occupied big apartments is six times the number of unoccupied big apartments.

(2) The building has a total of 160 apartments.

- A** Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient
B Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient
C BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient
D EACH statement ALONE is sufficient
E Statements (1) and (2) TOGETHER are NOT sufficient

Read the following passage and answer the given question.

One of the pioneers of anti-virus software has allegedly descended into drug-induced paranoia and is now wanted for murder, according to a popular tech website. John McAfee, the 67-year-old founder of the computer security company that bears his name, has been living in Belize in a jungle compound stockpiled with weapons and outfitted with a chemistry lab, reports a specialized tech review. McAfee has been using the lab to develop an antimicrobial agent derived from rainforest plants and also, according to the report, to experiment with a dangerous hallucinatory drug called MDPV, commonly used in so-called bath salts. His alleged erratic behaviour has increasingly alienated him from his fellow ex-pats, reportedly coming to a head when fellow American Gregory Paul was shot dead Saturday in his own home. McAfee is the prime suspect, reports the initial media source, citing a Belizean police spokesman.

- 381** According to the passage, what conclusion can be reasonably drawn from the text?

- A** The incontrovertible McAfee's guilt
B The creation of a new chemistry company in Belize ruled by McAfee
C The suspect McAfee's blame for the murder of Gregory Paul
D The discovery of new experimental studies on anti-virus software
E The physical consumption occurred to McAfee after his house moving to Africa

- 382** Find the missing number:

200, C, 105, XXXV, 40, X, 15, ?

- A** 20
B 5
C 3
D III
E 15

- 383** Three US soldiers, John, Will and Christopher are patrolling the main entrance of the American Embassy in Rome. John passes the front gate every 12 minutes. Will passes the front gate every 15 minutes and Christopher every 18 minutes. It's Midday and they have just set off on their routes at the start of their shift.

At what time will they meet up at the entrance again?

- A** 4.30
B 10.15
C 13.30
D 5.20
E 7.00

Read the following passage and answer the given question.

A special supplementary school in St. George (Bristol) is aiming to help children improve their grades after lessons. Champions Fun Learning Center, based in Church Road, is a registered charity, and uses volunteers to help children with English, math, and science from Key Stage One up to GCSE. All of the tutors are volunteers, and include qualified teachers, as well as teaching assistants and those with no teaching experience but who want to help. Around 150 children attend the school in the evenings and on Saturdays - most of whom are underachieving and come from a diverse ethnic background. Parents pay a small monthly fee to keep the center running and can tailor what their child learns to help them improve in particular subjects. The learning center's philosophy is that a little extra work at least once a week will see children develop confidence and learn skills that will supplement their school curriculum.

384 What is the aim of the Champions Fun Learning Center?

- A** To prevent child maltreatment in Bristol and surroundings
- B** To support underachieving children (and those who come from a different ethnic background) with remedial lessons
- C** To offer a free-of-charge school preparation for children and parents
- D** To improve students' commitment to family issues
- E** To grant a complementary free-of-charge school preparation carried on by experienced and graduated teachers

385 Find the opposite of the word given.

Huge

- A** Big
- B** Good
- C** Bad
- D** Tiny
- E** Ugly

386 Find the missing number:

7, XXI, 18, IX, 27, XXIV, 12, ?

- A** XXXVI
- B** 24
- C** 29
- D** 30
- E** XIX

387 The ideal journey would be by train, in a corner seat in an empty compartment, with well-upholstered seats. A corridor provides access to an efficient bar and a place for the children to play. There is a toilet and there are no traffic jams. It is the best way to see the country (at a steady pace); the easiest place in the world to doze or to read. You reach your destination rested and lively.

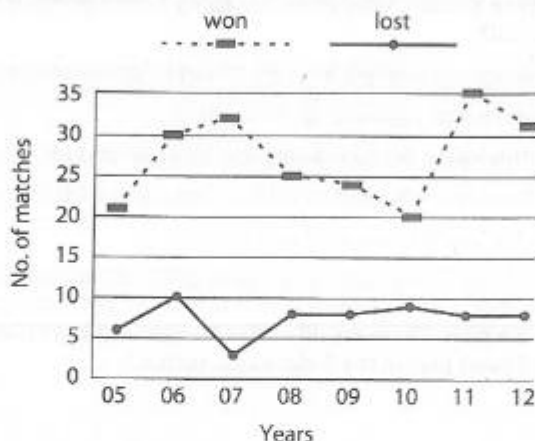
Which one of the following is an underlying assumption of the argument above?

- A** It is comfort that makes a journey ideal.
- B** It is important to be able to read while travelling.
- C** The author does not like children.
- D** The ideal journey is taken alone.
- E** It is possible to be lively and rested at the same time.

388 Lory is 3 years older than Karin and Karin is 5 years younger than Grace. In three years' time their total age will be 44. How old are now the three girls?

- A Lory: 15, Karin: 12, Grace: 17
- B Lory: 12, Karin: 9, Grace: 14
- C Lory: 9, Karin: 12, Grace: 15
- D Lory: 14, Karin: 9, Grace: 12
- E Lory: 5, Karin: 2, Grace: 8

The graph below plots the number of matches won and lost by a football team between 2005 and 2012.



389 If win rate is defined as the percentage of matches won to the total number of matches played in that year, what is the year with the highest win rate?

- A 2005
- B 2006
- C 2007
- D 2010
- E 2011

390 What is the year with the largest decrease in number of matches won over the previous year?

- A 2007
- B 2008
- C 2009
- D 2010
- E 2012

391 Of the eight years shown on the graph, which one has ratio of matches lost to matches won equal to $\frac{1}{4}$?

- A 2006
- B 2007
- C 2009
- D 2010
- E 2012

Read the following passage and answer the given question.

The Scottish independence referendum is a vote on the future of Scotland due to take place in 2014. It has been the subject of heated debate about the date and what the question will be. A vote in favour of independence would see the union between Scotland and England ended. Dennis Canavan, a Scottish Politician who has been a relevant Independent Member of the Scottish Parliament, claimed Scottish independence would be the "best thing to ever happen" to the party. During his last TV public statement, Canavan predicted Scottish Labour would become a more radically left-wing party following a Yes vote in the 2014 referendum. And he said the break from London would be like "escaping from a political straitjacket".

- 392 According to Canavan though, what does "escaping from a political straitjacket" mean for the future of Scotland?**
- A** To positively emancipate Scotland from the United Kingdom government
 - B** To react and demonstrate against England taxation
 - C** To prevent Scottish from a Yes vote during the 2014 referendum
 - D** To incite other three Home Nations to settle independence referendum
 - E** To dissent from the Scottish independence referendum
- 393 25% of the Oxford sports club's athletes are less than 14 years old. 20% of these under 14-year-old athletes are girls. There are 40 under 14-year-old boys playing for Oxford sports club. How many athletes play in the Oxford sports club?**
- A** 50
 - B** 100
 - C** 125
 - D** 150
 - E** 200

Read the following passage and answer the given question.

Overweight children are being given the chance to lose weight and improve their lifestyle in Ely. Energize, NHS Cambridgeshire's healthy lifestyles programme for children aged 7-11, was launched in Ely at the Paradise Pool last month but so far only five families have come forward. There are spaces for seven more. Val Thomas, a consultant in public health at NHS Cambridgeshire, said childhood obesity was a problem. "Being overweight can lead to serious health problems in later life such as diabetes, heart disease and cancer and it has negative effects on children's health and wellbeing." Energize sessions are held at the pool every Saturday from 10.30am-12.30pm, and are free.

- 394 What is the assumption of the argument above?**
- A** Childhood overweight is a crucial problem affecting all the Cambridgeshire families
 - B** Childhood overweight is a particular disease affecting just children aged 7-11
 - C** Childhood overweight is a dangerous sickness which will surely bring its patients to diabetes, heart disease and cancer
 - D** Childhood overweight is an illness that may be faced with a balanced diet and physical workout
 - E** Childhood overweight is a physical condition that can cause health problems

395 Find the missing numbers:

?, 4, 6, 12, 14, 28, 30, 60, ?

- A** 2, 42
- B** 3, 61
- C** 8, 20
- D** 6, 58
- E** 2, 62

396 The managing director of a private television has to assign five programmes (a, b, c, d, e, not necessarily in this order) to the five time bands of the day numbered from 1 to 5. He also has to assign each programme to each of the five compères (Bruno, Nicola, Pietro, Raffaele e Walter, not necessarily in this order).

- Raffaele is assigned to time band 2
- Pietro presents programme D
- programme E is televised in time band 4
- Nicola presents programme A in time band 3
- programme B is televised in time band 1

According to these statements, programme C:

- A** will be televised in time band 1
- B** will be televised in time band 5
- C** will be presented by Bruno
- D** will be presented by Raffaele
- E** will be presented by Nicola

397 According to the information given above, which of the following statements is true?

- A** Walter presents programme B
- B** Bruno presents programme E
- C** Either Bruno or Walter presents programme E
- D** Pietro presents a programme in time band 1
- E** Programme C is not presented by Raffaele

398 Find the opposite of the word given.

Asleep

- A** Ready
- B** Awake
- C** Alike
- D** Willing
- E** Awful

399 When I made a hotel reservation online yesterday I was given an 8-digit booking reference which contained no zeros. It did, however, consist of three 2-digit odd numbers followed by the sum of these three numbers, and all eight digits were different.

The first digit of the booking reference was 4. What was the last digit?

- A** 1
- B** 3
- C** 5
- D** 9
- E** 7

Read the following passage and answer the given question.

A plan to double the tax on Nutella, Italy's favourite breakfast treat, has landed the Italian government in a sticky mess. Yesterday, in a bid to reduce Italy's massive public debts, the Italian finance minister announced tax increases, including a rise in VAT on chocolate from 10 to 20 per cent. "This shows the government wants to hurt children," said an MP for the Northern League. "I have written a letter to all MPs to form a Defend Nutella Committee. This time the prime minister has been caught with his hand in the honey pot, or even the Nutella jar." His party represents the northern region of Piedmont, where the hazelnuts which go into Nutella are grown.

400 According to the passage, what conclusion upon the Italian government could be certainly drawn from the text?

- A** The Italian government has encountered economic difficulties in exporting chocolate
- B** The Italian government has carried out a law to preserve Nutella as a national common good
- C** The Italian government has planned tax increase on some food in order to reduce the national public debt
- D** The Italian government has created a Defend Nutella Committee to export chocolate in England
- E** The Italian government has been a subject of heated debate as per the state certification of quality of its gastronomic products

401 If the sentence "all children are spoilt" is false, it must be true that:

- A** there are no spoilt children
- B** all the children are not spoilt
- C** at least one child is not spoilt
- D** children are all well-mannered
- E** at least one child is spoilt

Read the following passage and answer the given question.

The Tube, one of the most important Newcastle TV rock show, is today celebrating a landmark anniversary. It's 30 years since the program, which was presented by Paula Yates and Jools Holland, first aired on Channel 4. Famed for its controversy, as well as the stellar list of top acts who performed live, The Tube is still fondly remembered by both music fans and those who worked on the show all those years ago. The guest list saw everyone from Paul McCartney to U2, and Elton John to The Jam feature on the program which helped put Newcastle on the musical map.

Malcolm Gerrie, former producer of The Tube, says all the old memories of the program have been at the forefront of his mind of late as he has been working on a new TV show which documents Jools' 30 years in the entertainment industry, called Earlier With Jools Holland.

402 According to the passage, The Tube:

- A** is one of the most important TV shows ever broadcasted
- B** is an important TV rock show started during the 90's
- C** has been formerly produced by Paula Yates and Jools Holland
- D** started as a travel TV show on Newcastle during the 70's
- E** has been an historical stage-set for rock stars and famous bands

Read the following passage and answer the given question.

Popcorn rustlers beware: an etiquette guide for moviegoers has been published to stop inconsiderate watchers from ruining a night at the flicks. Empire Cinemas has launched its campaign after a poll found two thirds of patrons were too polite to tell fellow cinema-goers off for bad behaviour - although more than half of fans said they got annoyed by people talking during a film. Other common gripes included people rustling their popcorn, slurping drinks and putting their feet on chairs, while 15 per cent said the biggest problem was public displays of affection once the lights had gone down. TV presenter Paul Ross, who will be fronting Empire's campaign for politer pictures, said his interest in the campaign had been due to a traumatic experience. "Years ago, I smelt a strange smell and saw some odd movement in my peripheral vision. And there, at the end of the row, a middle aged man had pulled out a wooden stool with a leg missing and was gluing it back together - in the dark. Inappropriate doesn't even enter into it. We go for the movie not the madness."

403 Which one of the following, if true, weakens this argument?

- A Buying popcorn at the cinema can be forbidden
- B The moviegoer may eat, drink and chat just at before and after the movie projection
- C The moviegoer can behave properly by avoiding loudly chatting, popcorn rustling, drinks slurping, putting feet on chairs and pursuing potential offensive displays of affection
- D Just one among the following: avoiding loudly chatting, popcorn rustling, drinks slurping, putting feet on chairs and pursuing potential offensive displays of affection can bring to drastic counter-actions
- E Etiquette guides are usually ignored by bad-mannered people

404 Giovanni is carrying out a survey on a new portable computer. He finds out that 64% of the people interviewed cannot use the Internet. In addition, 30% of these don't have a computer, 55% have a home computer and 15% have a portable computer. The people interviewed who cannot use the Internet but have a computer (either home or portable) are 56. How many people among those interviewed can use the Internet?

- A 205
- B 80
- C 125
- D 45
- E 65

405 Frank strongly denied that he had not refused to lie.

According to this statement, say which of the following is true.

- A Frank lied
- B Frank refused to lie
- C Frank told the truth
- D No one of the previous statements is true

406 A bottle of 750 ml of "Primitivo di Manduria" a typical red wine of Apulia costs 14 Euros. If the wine costs 10 Euros more than the empty bottle, how much does the wine cost per litre?

- A 12
- B 14
- C 15
- D 16
- E 32

Read the following passage and answer the given question.

Jaguar revealed plans for expansion as it builds more engines at the i54 site over the next five years. JLR, which is spending £355 million on the plant, briefed potential investors on progress. Bosses underlined the importance of the new engine factory to the future of the company as it develops its new range of i4 inline diesel and petrol engines for new cars being developed. The West Midlands-based luxury car maker is planning to more than double the number of its vehicles made annually to 600,000 by 2020. It plans to make six new Range Rovers, five new versions of the Discovery and Freelander and five Defenders, including a pick-up. JLR revealed that JLR was even talking to schoolchildren at pre-GCSE ages about jobs. He said: "We want to encourage them into engineering, explaining that there will be jobs for the next 10 or 20 years and more." Mark Green, senior project manager for building partner Interserve, told the briefing at the Birmingham NEC ahead of the start of the Advanced Engineering Show, that each of the two factory buildings at i54, due to open in 2014, would be as big as four football pitches. He said work was making excellent progress despite recent bad weather.

407 Which of the following sentences could be clearly gathered from the text?

- A** JLR is planning to more than double its vehicles production by 2020
- B** JLR is promoting its vehicles by talking to schoolchildren at pre-GCSE ages
- C** JLR believes in the excellent progress that occurred in the engineering sector "despite recent bad weather"
- D** JLR is planning to more than double the production of new six new Range Rovers, five new versions of the Discovery and Freelander and five Defenders, including a pick-up
- E** JLR is seeking economic impulse from external companies to start with the production of its new car models

Read the following passage and answer the given question.

With autumn fast approaching - and many of the summer bedding plants coming to an end - then why not keep your garden in flower by adding some winter bedding? Winter pansies and violas, for example, are a great way to add a splash of colour to your garden. If you are wanting to put shrubs into your garden then now is a good time, if you leave it too late it may mean that your shrubs will not establish themselves strong enough in time for the cold of winter. It is also the time to plant bulbs in order to get blooms in spring, there are many different bulbs to suit everyone, from daffodils, tulips and crocus through to more delicate flowers such as freesia and alliums.

Spring bulbs at the Hilltop Garden Centre (Shilton) start from £1.99 and are great value for money.

408 According to the information given, which of the here below is the best option to decorate your garden during the autumn?

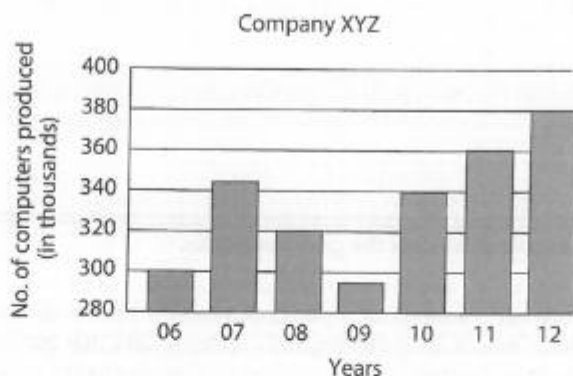
- A** To bed out and water the summer plants
- B** To throw out your plants and buy new decorations
- C** To add new bulbs, shrubs and flowers to the actual garden plants
- D** To bed out the summer plants and enrich your garden with new bulbs, shrubs and flowers
- E** To buy spring bulbs at the Hilltop Garden Centre, as they are great value for money

409 Find the opposite of the word given.

Early

- A** Rarely
- B** Soon
- C** Spring
- D** Barely
- E** Late

Look at the following graph and answer the questions.



410 During which period was the percentage growth of the number of computer the highest?

- A 2006-2007
- B 2008-2009
- C 2009-2010
- D 2010-2011
- E 2011-2012

411 Approximately, the average annual computer production during 2006-2012 is:

- A 295,000
- B 300,000
- C 310,000
- D 335,000
- E 340,000

412 Find the missing letters:

e, v, f, u, g, t, h, s, ?, ?

- A i, r
- B l, s
- C i, t
- D h, t
- E s, i

413 Find the opposite of the word given.

Cute

- A Unattractive
- B Clever
- C Elegant
- D Warm
- E Curse

414 During a race on a straight line, Mark starts running at a speed of 10 m/s. After 10 seconds, Albert starts running at a speed of 12 m/s. At what distance from the starting line will Albert catch up with Mark?

- A 5 seconds
- B 10 seconds
- C 30 seconds
- D 50 seconds
- E 12 seconds

Read the following passage and answer the given question.

"Fewer than 10 parents responded to controversial proposals to ban skirts at Moulton school in Northamptonshire", the head teacher revealed. Many pupils and parents were in uproar after two female students were sent home from school for breaching strict uniform rules that banned skirts and skinny fit trousers. But the Moulton head teacher said parents had had ample chance to object before the policy was announced in June to prevent 'over-sexualisation' of girls. "There were very few objections indeed", he head teacher said. "We have also had lots of informal positive feedback this term from parents who are supportive of a tight line over uniform, particularly in that it avoids arguments at home, i.e. the parents no longer have to argue with their daughters about what is acceptable because we do it for them. We have also helped out quite a number of parents who were struggling financially to make the change. Those still complaining over the uniform changes are a very tiny few.

415 According to the head teacher's account:

- A just a few parents had knowledge of the policy before the incident
- B just a few parents complained about the policy before its announcement in June
- C just a few parents were struggling financially to make the uniform change
- D there are many parents which are still complaining over the uniform changes
- E many parents still refuse to be appeased on the incident

416 In a given year the month of January (which has 31 days) contains five Fridays. Which one of the following CAN'T be true?

- A The first Friday in the month occurs before the 4th
- B The 1st January is on Wednesday
- C There are only 4 Tuesdays
- D There are 5 Sundays
- E The 31st January is on Monday

417 In Bruno's pub there are some volleyball players and some basket players. The volleyball players are 20% of the total people. Some basket players leave and the number of those remaining is 50% of the original total. What is the ratio between the number of the basket players who left Bruno's pub and the total amount of basket players?

- A 5/8
- B 1/2
- C 1/5
- D 3/4
- E 6/8

Find the diagram that represents the relationship among the three sets given in each exercise.



Diagram 1

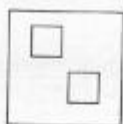


Diagram 2

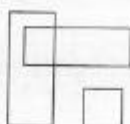


Diagram 3

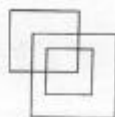


Diagram 4

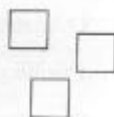


Diagram 5

418 Schools, hospitals, workers.

- A Diagram 1
- B Diagram 2
- C Diagram 3
- D Diagram 4
- E Diagram 5

419 Flowers, roses, orchids.

- A Diagram 1
- B Diagram 2
- C Diagram 3
- D Diagram 4
- E Diagram 5

420 Drummers, musical instruments, red-haired people.

- A Diagram 1
- B Diagram 2
- C Diagram 3
- D Diagram 4
- E Diagram 5

421 Italians, Brazilians, actors.

- A Diagram 1
- B Diagram 2
- C Diagram 3
- D Diagram 4
- E Diagram 5

422 Dogs, quadrupeds, sick animals.

- A Diagram 1
- B Diagram 2
- C Diagram 3
- D Diagram 4
- E Diagram 5

The table below shows the number of people who responded to a survey about their favourite ice cream flavour.

Age	10-18	19-30	Over 30
Chocolate	29	33	28
Vanilla	20	31	24
Strawberry	12	18	22
Mint	16	22	29
Lemon	10	15	17
Yogurt	8	14	20
TOTAL	95	133	140

423 What percentage of respondents over 30 indicated that Chocolate is their favourite flavour?

- A 20%
- B 15%
- C 18%
- D 28%
- E 25%

424 Approximately, what percentage of respondents aged 19-30 indicated a favourite flavour other than Strawberry?

- A 92%
- B 96%
- C 86%
- D 75%
- E 62%

425 Approximately, what percentage of the total sample indicated that Yogurt is their favourite flavour?

- A 25%
- B 22%
- C 19%
- D 15%
- E 11%

426 Approximately, what percentage of the total sample where aged 10-18?

- A 15%
- B 26%
- C 29%
- D 32%
- E 35%

Read the following passage and answer the given question.

Russia's energy minister Alexander Novak is to host a Russian Day at a gas industry conference in London next month.

The role of Russia as a global supplier of natural gas will be examined during the day-long session, which will also feature the chief executives of petrochemical giant SIBUR and liquefied natural gas exporter Sakhalin Energy.

Other government and state energy executives will also be at the event to explore investment and financing issues in Russian energy and project development. The organizers of the Gastech event said the Russian Day was being developed in collaboration with Russia's energy ministry "amid growing political will in Russia to diversify the customer base and drive forwards liquefied natural gas (LNG) exports to increase business with Asian gas consumers".

427 According to the passage, which is the aim of the Russian involvement at the gas industry conference in London?

- A** It will be examined during the day-long Gastech session
- B** To get in touch with other government and state energy executives at the event to explore potential investments
- C** To present the role of Russia as a global supplier of natural gas in both Europe and Asia
- D** To diversify the customer base and drive forwards liquefied natural gas exports to increase business with Asian gas consumers
- E** There is no evidence of this element inside the text

428 "All sidewalks of New York City are reserved for pedestrians. Brad is a pedestrian". Which of the following propositions is true?

- A** If Brad didn't meet other pedestrians, he wouldn't be on the sidewalk
- B** Brad loves New York City's sidewalks
- C** Brad must necessarily meet other pedestrians on the sidewalk
- D** Brad may meet other pedestrians on the sidewalk
- E** Brad walks only on the sidewalk

429 With an annual interest rate of 7%, determine the amount of money you need to invest in order to realize a 3-month interest of 700 dollars.

- A** 24,000 dollars
- B** 26,000 dollars
- C** 40,000 dollars
- D** 49,000 dollars
- E** 49 dollars

430 Find the missing letters:

b, e, g, j, l, o, q, t, ?, ?

- A** v, y
- B** u, w
- C** w, y
- D** u, v
- E** v, w

431 30% is equivalent to:

- A** 0,03
- B** 0,003
- C** 0,3
- D** 3
- E** 0,030

432 Find the opposite of the word given.

Healthy

- A** Sane
- B** Harmful
- C** Acid
- D** Helpful
- E** Cosy

433 In 1988, Samuel's age was exactly seven times that of his daughter Scarlet. In 2014, Peter will be 47 years old. How old will Scarlet be?

- A** 33
- B** 30
- C** 29
- D** 24
- E** 23

434 Find the missing letters:

k, k, l, m, m, n, o, o, p, q, ?, ?

- A** q, p
- B** q, q
- C** r, s
- D** q, r
- E** r, p

Read the following passage and answer the given question.

It hadn't occurred to me to go to Rotterdam before. Not for a short break anyway. There are so many more appealing prospects in Holland - The Hague, Haarlem, Utrecht, Amsterdam... Rotterdam I knew had been flattened by the Luftwaffe at the outbreak of the Second World War. It had stuck in my mind not so much as a cultural city, but as one of the world's biggest ports, a giant container dock sprawling around the mouth of the Rhine. So when I went for the first time the other week it was for a particular reason - to see an art exhibition in the Boljmans Van Beuningen Museum. The exhibition, which runs until January, is devoted to Jan van Eyck, the Flemish painter who worked mainly in Bruges in the 15th century. I have always been drawn to his brilliantly luminous, lifelike paintings, and since Rotterdam is only a very short hop from London City airport, it seemed a good chance to see the art and get a feel for the city.

435 Why has the author never considered spending a short break in Rotterdam?

- A** Because he has always thought Rotterdam not to be such a cultural city
- B** Because he always preferred to visit other Dutch prospects i.e. The Hague, Haarlem, Utrecht, Amsterdam
- C** Because he never took into consideration the idea of visiting Holland before this art exhibition
- D** Because he never appreciated Jan van Eyck paintings
- E** Because Rotterdam is too close from London City airport

Read the following passage and answer the given question.

Kitty Campbell received a telegram from the Queen as she celebrated her 100th birthday yesterday with friends and staff at St Martha's Residential Home, Thornhill Park. "I never thought I'd see 100," she said. "I'm in good health and it's kind of everybody to come along. It's lovely. I've had loads of presents and cards". Kitty still lives independently, visiting the residential home once a week and attending the Holy Rosary Church, Farringdon, every Sunday. Kitty was an only child and never married or had children. She claims to have "led a very uneventful life". "I worked in Birmingham during the war in an aircraft factory for Vickers-Armstrongs. I was thrown in at the deep end - we all were," she said. After the war Kitty worked in the canteen at Brian Mills factory until she retired at the age of 60. At 90, a trip to Lourdes, in France, saw Kitty take her first plane flight. Despite having no children of her own, Kitty has a close relationship with her god-daughter, Kathleen Mountain, and loves to spend time with her cats. St Martha's manager Jill Hepple said: "She lives in a bungalow by herself and has a carer who goes in on a morning to help her get ready, but she's always ready by the time the carer turns up. "She's really independent."

436 What does Kitty mean by stating she "led a very uneventful life"?

- A** Kitty's life has been really troubled and stressful
- B** Kitty led her life with courage and determination
- C** Kitty's life has been dull and tranquil
- D** Kitty led her life with regret and disappointment
- E** Kitty led a very adventurous and exiting life

437 Find the synonym of the word "Discount".

- A** Price
- B** Store
- C** Retailer
- D** Amount
- E** Reduction

438 Find the missing number:

24, 48, 16, 12, 60, 10, 3, ?

- A** 12
- B** 24
- C** 26
- D** 27
- E** 28

439 Mary will pass a 50-item test if she guesses 70% of the answers. How many items can she miss to pass the test?

- A** 12
- B** 18
- C** 20
- D** 10
- E** 15

Read the following passage and answer the given question.

An arts graduate has created a fashion collection for the world's smallest catwalk. Her name is Christina Ruby Walton, a fashion student from the University of the Creative Arts (UCA) in Epsom. Ms Walton, 22, of Somerset, spent two weeks redesigning River Island's 2012 Chelsea Girl brand with their fashion team. Ten outfits were made to fit 21 cm high and 4 cm wide mannequins - an eighth of the size of a catwalk model. Ms Walton said: "The project was really great fun to be involved in and I'm proud and excited to be able to put the world's smallest catwalk on my CV. The Chelsea Girl team were great to work with and I strived to recreate the designs with as much detail and accuracy as possible in order to reflect their brand in the best possible way. It was really satisfying to see the garments on the tiny catwalk up against the full-size Chelsea Girl garments at the launch party and I'm really pleased with how they turned out."

440 According to the information given in the passage, why is Christina proud and excited?

- A** Because she has seen her mini-models against the full-size Chelsea Girl garments at the launch party
- B** Because she succeeded in reflecting the Chelsea Girl brand identity into her mini-models
- C** Because she is having the chance to demonstrate her fashion skills
- D** Because she can now put this working experience into her CV
- E** Because she succeeded in managing a complex fashion project with great fun

Read the following passage and answer the given question.

Londoners are always of the opinion that getting anywhere in London takes "about an hour". But according to a recent research, the average London commute is 75 minutes - which is pushing our definition of an hour. You might expect a gender split (men travel for longer) but what's interesting is that over the last six years, the commute time for men and women is starting to match up: 79 minutes for men in 2006, 77.2 in 2012 and 69.8 minutes for women in 2006, 72.8 in 2012. The researchers explain the increase in part-time work - particularly among men. At least the women are getting more value for their increasing fares.

441 Looking at the research result, is it possible to state that getting anywhere in London takes "about an hour"?

- A** Yes, it usually takes exactly one hour for Londoners to move
- B** No, the research just revealed that the average time spent for Londoners to move is 75 minutes
- C** It depends: there is a sensible gender split (men travel for longer)
- D** No, the research just revealed that over the last seven years the commute time for men and women is starting to match up
- E** Yes, because women are getting more value time for their increasing fares

442 According to the information given, say which sentence is true.

Mark is blond-haired.

Some blond-haired people like classical music.

- A** Mark loves classical music
- B** Mark may like classical music
- C** Mark doesn't like classical music
- D** Dark-haired people don't like classical music
- E** All blond-haired people like classical music

Read the following passage and answer the given question.

Your emotions can certainly impact your decisions, but you might be surprised by the extent to which your emotions affect your pocketbook. New research from psychological scientist Jennifer Lerner of the Harvard Kennedy School of Government and colleagues Yi Le and Elke U. Weber of Columbia University explores how impatience brought on by sadness can produce substantial financial loss. Using data collected at the Harvard Decision Science Laboratory and the Center for Decision Sciences at Columbia, the authors found that subjects randomly assigned to view a video that induced sadness exhibited impatience and myopia, which were manifested in financial decisions that elicited higher gains in the short term, but lesser gains over the longer term. Thus, subjects in the sadness condition earned significantly less money than subjects in the neutral condition. They showed what is known as "present bias," wherein decision makers want immediate gratification and so they ignore greater gains associated with waiting.

443 According to the research result, why is sadness producing financial loss?

- A** Because sadness is brought by impatience and push towards impulse buy
- B** Because sad people tend to make financial decisions that seem worth in the short term, but reveal their disadvantages in the long run
- C** Because sad people are usually myopic and often misread sales prices
- D** Because sad people want greater gains associated with waiting
- E** Because sad people are usually impatient and this cause frequent arguing

444 According to the information given, say which sentence is true.

The director told us that unless we work extra time we can't meet with our customers' needs.

- A** Our customers will be satisfied only if we work extra time
- B** Our customers want us to work extra time
- C** If we work less our director will give us the sack
- D** Our customers' needs are uninfluential on our job

445 If the value of a share increases by 10% in January and decreases by 10 % in February, what will the share value after these variations be?

- A** The same as before
- B** Less than before
- C** More than before
- D** More than 10 dollars
- E** None of the answers above is correct

446 If 10 painters can paint 10 rooms in 10 hours, then how many hours would it take 5 painters to paint 5 rooms?

- A** 1
- B** 5
- C** 10
- D** 7
- E** 15

447 If 62 people out of 100 are female, how many people out of 250 are male?

- A** 38
- B** 76
- C** 95
- D** 104
- E** 155

Read the following passage and answer the given question.

Every country is represented by a symbol or symbols that give it its unique recognition from other countries.

England, which is one of the countries that comprise Great Britain, has many familiar symbols which are automatically connected with it even without an accompanying explanation. It has, in fact, three national symbols comprised of the St. George's Cross (as seen on the flag), the Three Lion Emblem (as seen on England's Cricket Team Badge) and the Red Rose (as seen on the English Rugby Union Team Badge). These three symbols more or less represent England and its culture along with other familiar symbols such as St. Edward's Crown, the Oak Tree, and tea. There are some personalities which have been iconized and are often considered official English symbols: St. George, the country's patron saint, Alfred the Great who is recognized as the most dominant ruler of England, and Robin Hood who is the heroic outlaw perpetuated by English folklore.

448 According to the passage, what can be considered to be England symbols?

- A** Representing Great Britain worldwide
- B** Just an old inheritance with no reflection on present cultural habits
- C** Exploited just in the sport sector to distinguish the England team from the one of the other three Home Nations
- D** St. George's Cross, the Three Lion Emblem and the Red Rose only
- E** A mixed group of national and familiar symbols which still represents England and its culture

449 The cost of a private plane flight to Barcelona from London is £ 500 per person. Meals are extra and cost £ 12 per person. If the number of people who paid for meals was 100 less than the number who did not, and if the cost for the whole plane flight came to £151,200 how many people paid just for plane flights on this trip?

- A** 110
- B** 120
- C** 150
- D** 200
- E** 250

450 A student on a gap year is planning a long road trip of 5,000 to 8,000 miles. The cost of petrol will be £ 1.10 to £ 1.50 per litre, and his car will average 30 to 50 miles per gallon. What is the maximum possible cost of petrol he could incur for the trip? (Use 1 gallon = 4.5 litres)

- A** £ 675
- B** £ 1,080
- C** £ 1,125
- D** £ 1,320
- E** £ 1,800

451 Replace X and Y to complete the proportion.

Back : front = X : Y

- A** X = nape; Y = spine
- B** X = knee; Y = nose
- C** X = shoulders; Y = eyes
- D** X = yesterday; Y = now
- E** X = forehead; Y = beard

Read the following passage and answer the given question.

Parents may have some new motivations to serve their kids vegetables. A new study, funded by Pinnacle Foods' Birds Eye brand and published in Public Health Nutrition, found that adding vegetables to the plate led to more positive evaluations of both the main entrée and the cook. By simply serving vegetables with dinner, participants believed the main course would taste better and thought the server was more thoughtful and attentive. "Most parents know that vegetables are healthy, yet vegetables are served at only 23% of American dinners," said lead author Brian Wansink, PhD, the John Dyson Professor of Marketing and Consumer Behaviour at Cornell University. "That means we need to find some new motivations to encourage parents to make vegetables a bigger part of the meal. If parents knew that adding vegetables to the plate could make what they prepare for dinner seem more appealing, or could increase their own "heroic" appeal, then maybe they'd be more inspired to serve vegetables."

452 Following the results of the above mentioned research, adding vegetables to the plate led to:

- A** an healthier perception of the main entrée
- B** a massive vegetables consumption during American dinners
- C** a lower esteem of the meal server
- D** a better perception of the main entrée and the cook
- E** a massive vegetables consumption from children and aged-people

453 According to the information given, say which sentence is true.

Juliet drinks twice as much beer as Robert and eats one third of his chips.

- A** Robert eats more than Juliet
- B** Robert drinks more than Juliet
- C** Juliet eats and drinks less than Robert
- D** Juliet eats as much as Robert
- E** Juliet drinks less than Robert

454 Find the opposite of the word given.

Fair

- A** Disloyal
- B** Loyal
- C** Honest
- D** Rainy
- E** Fog

Read the following passage and answer the given question.

An app offering real-time translations is to allow people in Japan to speak to foreigners over the phone with both parties using their native tongue. The products have the potential to let companies avoid having to use specially trained multilingual staff, helping them cut costs. They could also aid tourism.

455 Which one of the following, if true, weakens this argument?

- A** The software involved should be updated by specially trained multilingual staff
- B** The software involved cannot offer perfect translations, limiting its use in some situations
- C** The software involved cannot help cut costs for companies
- D** Real time translations on the phone delay mutual understanding
- E** Real time translations on the phone limit direct human contact

Read the following passage and answer the given question.

Older North American farmers work fewer hours than their younger peers but spend more time operating heavy machinery and equipment-raising their risk of serious injury, according to new research from the University of Alberta. A survey of 2,751 farmers showed that as farmers age, they turn to less physically strenuous work such as operating machinery. Farmers aged 45 to 64 years spent six to eight more days a year operating tractors—a situation that puts older farmers at risk, say the study authors. "It's important for farmers, especially those from farm families where the older 60-plus crowd is still working, to understand that operating machinery is still a high-risk activity," said lead author Don Voaklander, a professor in the School of Public Health and director of the Alberta Centre for Injury Control and Research. The study, published in the November issue of the *American Journal of Industrial Medicine*, found that farmers aged 45 to 54 spent a median of 67 days a year operating tractors and combines—the most among any age group—followed by farmers aged 55 to 64, who spent 65 days operating machinery. In comparison, farmers aged 25 to 34 spent just 61 days on machinery.

456 According to the passage, what conclusion could be certainly drawn from the text?

- A** Farmers aged 45 to 64 years still work hard on the field
- B** Older farmers tend to work still but are keener to operate with heavy machinery and equipment
- C** Farmers in their Sixties spent a median of 67 days a year operating tractors
- D** Young farmers tend to work less than older do
- E** Young farmers' working method could raise their risk of serious future injury

Read the following passage and answer the given question.

Fifteen science academies of Africa issued a joint statement in Lagos, Nigeria, today calling on the African scientific community to intensify its study of the impact of climate change. Noting that Africa's scientific contribution to understand climate change has been "meagre" to date, the joint statement calls for African researchers to step up their observation, modelling and analysis of the effects of climate change on a regional scale, to help plan interventions in order to mitigate the impacts of climate change on the continent. The statement was presented at the eighth annual conference of African Science Academies in cooperation with the African Science Academy Development Initiative (ASADI). The initiative, supported by the Bill & Melinda Gates Foundation, is a partnership between the U.S. National Academy of Sciences and several African science academies to strengthen their capacity to provide evidence-based advice to inform policymaking and public discourse.

457 According to the passage, how has the Africa's scientific contribution to understand climate change been in recent times?

- A** Scarce
- B** Complete
- C** Exhaustive
- D** Sectorial
- E** Rough

458 In a classroom there are 12 students who have to be paired up. How many different pairs can be made?

- A** 66
- B** 24
- C** 120
- D** 132
- E** 56

Read the following passage and answer the given question.

Spending by British holidaymakers rose by seven per cent this summer, compared with the same period last year, according to the latest figures from the Office for National Statistics. Its research also indicated that many Britons delayed their summer holidays until after the Olympic Games. The number of overseas trips taken during September rose by five per cent to 6.49 million, while the total number of trips made during the three months of July, August, and September rose by just one per cent.

459 According to the results of the research, say which of the following statements is true.

- ☐ A Britons spent less money for their holidays last summer
- ☐ B Britons mostly went on holidays before the Olympic Games
- ☐ C People took more overseas trips in January than in July and August
- ☐ D Spending by British holidaymakers rose to seven per cent this summer
- ☐ E Britons mostly went on holidays after the Olympic Games

460 According to the information given, say which sentence is true.

How Kevin managed to assemble that bookshelf is beyond me.

- ☐ A I can't understand how he could assemble that bookshelf
- ☐ B I would have assembled that bookshelf better than him
- ☐ C I think he couldn't succeed in assembling that bookshelf
- ☐ D I found it easy for him to assemble that bookshelf
- ☐ E I know he could assemble that bookshelf

Read the following passage and answer the given question.

Chocolate may be good for the heart, say scientists cautiously, following a large study which found that those who eat more of it are less likely to suffer heart disease and strokes. Why chocolate-lovers should be better off than those who shun it is not altogether clear, however. While it contains antioxidant flavonoids, known to be protective, it also contains sugar and milk powder, which are implicated in weight gain. Dieticians suggested that eating chocolate is helpful because people find it relaxing.

461 Which of the following is the best statement of the flaw in the above argument?

- ☐ A It assumes that dieticians would recommend eating chocolate to anyone regardless of their health condition
- ☐ B It ignores that chocolate always causes heart problems
- ☐ C It states that chocolate contains antioxidant flavonoids
- ☐ D It ignores that chocolate is implicated in weight gain
- ☐ E It suggests dieticians should not recommend eating chocolate

462 According to the information given, say which sentence is true.

- ☐ A I was about to fall on those who were sitting before me but didn't
- ☐ B I managed not to fall on those who were sitting before me
- ☐ C I fell on those who were sitting before me before the bus got so crowded
- ☐ D I couldn't prevent from falling on those who were sitting before me
- ☐ E The bus was so crowded that I couldn't help falling on those who were sitting before me.

463 The sale price of a car was euro 10,000 in 2011 and 12,000 in 2012. Determine the percentage increase.

- ☐ A 25%
- ☐ B 12%
- ☐ C 6%
- ☐ D 30%
- ☐ E 20%

Find the diagram that represents the relationship among the three sets given in each exercise.



Diagram 1

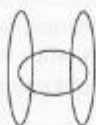


Diagram 2

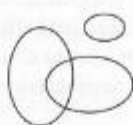


Diagram 3



Diagram 4



Diagram 5

464 Painters, elderly, shy people.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

465 European people, Italian people, people who speak English.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

466 Young men, employees, unemployed.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

467 Graduates, lawyers, lawsuits.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

468 Authors of books, republicans, libraries.

- ☐ A Diagram 1
- ☐ B Diagram 2
- ☐ C Diagram 3
- ☐ D Diagram 4
- ☐ E Diagram 5

Read the following passage and answer the given question.

Tomatoes were first introduced to Italy from South America in 1522. At first the tomato was believed to be poisonous. Fortunately, the poorer peasants of the region finally overcame their doubts about tomatoes in the 17th century and began adding it to the bread dough, and the first pizzas were created. As the popularity of the tomato became widespread, mozzarella cheese was slowly gaining ground. Mozzarella had become available in Italy only after water buffalo were imported from India in the 7th century, (mozzarella was first made with water buffalo milk). Its popularity grew very slowly until the last half of the 18th century, but the cheese and tomatoes did not meet on a pizza until 1889. In 1889, an Italian tavern owner named Don Raffaele Esposito developed a pizza featuring tomatoes, mozzarella cheese and basil - ingredients bearing the colors of the Italian flag. He named it the Margherita Pizza, after the Queen of Italy, Margherita Teresa Giovanni. Thus, modern-day tomato-and-cheese pizza was born.

469 According to the passage, which of the following conclusions CANNOT be drawn?

- A** At first, people were afraid to eat tomatoes
- B** Pizza became popular thanks to the quality of the ingredients
- C** Pizza was named after the Queen of Italy Margherita
- D** Water buffalo was imported from India
- E** Tomatoes came from South America

470 According to the information given, say which sentence is true.

Had they been warned the fridge was broken they might not have bought fresh food.

- A** They bought some fresh food but couldn't store it safely
- B** If they had bought fresh food they couldn't store it now
- C** If the fridge were not broken they would be warned
- D** They bought fresh food although they had been warned the fridge was broken
- E** They bought some fresh food and could store it safely

Read the following passage and answer the given question.

Australia's Antarctic researchers have taken a rare look at the luminous world under the polar sea ice, and brought it home. A remotely operated underwater vehicle was sent into the frozen depths of the Southern Ocean about 3400 kilometres south-west of Hobart to find vibrant light under the jumbled pack ice. It came back with an abstract artist's palette of blues and greens. On the late-winter voyage the icebreaker Aurora Australis punched into the ice and stayed fixed while researchers fanned out to gather data. They drilled a hole in the ice beside the ship to lower the ROV through, then operated it by a joystick as its cameras took them on an under-ice ride.

471 According to the information given say which of the following statements is true.

- A** Researchers have taken a rare look at the Arctic Ocean
- B** The mission took place about 3400 kilometres north-west of Hobart
- C** The voyage was held in late summer
- D** The underwater vehicle was remotely controlled with a joystick
- E** The world under the polar sea was completely dark

472 One book has 1000 pages. How many digits are necessary to number all the pages?

- A** 500
- B** 1000
- C** 2983
- D** 3654
- E** 4093

Read the following passage and answer the given question.

The cabin crew identified some of the most annoying passenger habits they encounter in their work. Passengers clicking their fingers to gain attention was the most widespread bugbear of those questioned, with 26 per cent identifying it as their biggest gripe. Other irritating habits included rushing to leave the plane before seatbelt signs are turned off, trying to cram too much hand luggage in overhead lockers, talking through safety demonstrations, and stuffing rubbish into the seat pockets. Lower level annoyances were ringing the attendant bell to complain about temperatures, and asking for a specific brand of drink.

473 Which one of the following is an assumption on which this argument depends?

- A** 26 per cent of the passengers are annoying
- B** Passengers are annoyed by cabin crews habits
- C** Cabin crew may be irritated by some passenger habits
- D** Cabin crew usually complains about passenger habits
- E** Passengers should not unfasten their seatbelts before signs are turned off

Read the following passage and answer the given question.

Nearly half of all consumers are reaching for their smartphones to window shop for the right product to buy, but they are not all clicking the "buy" online box, a new study has found. A survey of 3020 Australian adults found that 47 per cent were using their phone to browse stores and products but only 25 per cent were purchasing online from their phones. Instead, consumers were using phones to compare prices, locate stores, read reviews and check product availability online. The study found nine out of 10 Australians had used a personal computer to begin their shopping research. Of those surveyed 25 per cent they had used a tablet. Consumers could nominate more than one device mode. Shoppers who looked for a product on a computer almost uniformly had bought online too, 91 per cent, but mobile shoppers were much less likely to purchase online. Tablet users were more likely than phone shoppers to buy using their tablet with 16 per cent overall of those surveyed buying through a tablet.

474 According to the passage:

- A** 91 per cent of consumers surveyed had bought a tablet
- B** 25 per cent of consumers surveyed had bought a computer
- C** almost half of consumers surveyed had used their phones to browse stores
- D** 16 per cent of consumers surveyed had used their tablet to browse stores
- E** only one out of 10 Australians knows how to use a personal computer

475 During the first week Michael reads $\frac{1}{5}$ of his book, during the second week half of the remaining pages and during the following week the last 80 pages. How many pages has Michael's book in total?

- A** 80
- B** 250
- C** 160
- D** 200
- E** 240

476 Mario's scores on his last four exams were 23, 18, and 28. What is Mario's average score?

- A** 23,5
- B** 23
- C** 24,5
- D** 24
- E** 22,5

Read the following passage and answer the given question.

Most conventional egg-laying hens are kept in tiny battery cages that can give each hen less space than you'd get with a standard sheet of A4 printer paper. While battery cages are being phased out in some states, including California, the life of a cage-free bird isn't much better, with birds kept crammed in warehouses that allow them little more space. Even in many government-sanctioned organic egg companies, hens only get occasional access to the outdoors.

477 Which of the following can reliably be inferred from the information given?

- A** Battery cages granted better conditions to egg-laying hens than warehouses
- B** No company grants good farming conditions to egg-laying hens despite sanctions
- C** In some egg company hens have everyday access to the outdoors
- D** Egg-laying hens should get frequent access to the outdoors
- E** Eggs produced by hens living in warehouses are certainly better than eggs produced in battery cages

Read the following passage and answer the given question.

The Greek debt crisis is said to threaten the survival of the eurozone and a global financial meltdown worse than the one set off by the collapse of Lehman Brothers in 2008; each new prediction of default sends frissons of panic and flurries of speculation through the markets. In June the ratings agencies said that German Chancellor Angela Merkel's plan to persuade Greece's private creditors to roll over the debt into longer-maturing bonds would be deemed a "credit event"-finance-speak for a default that triggers debt insurance policies, in which American as well as European banks are heavily implicated. That, Merkel told the German Parliament, could have "uncontrollable consequences" for financial markets. At the eleventh hour, an EU summit agreed in principle to a new rescue package of up to 120 billion euros, but demanded further cuts and tax hikes to close a 5.5 billion euro "black hole" in the existing plan.

478 The passage provides information that helps to answer which of the following questions?

- A** What are the decisions of the German Parliament?
- B** Is the Greek crisis having any effects on the financial market?
- C** Why has the relationship between the collapse of Lehman Brothers and the Greek crisis been so important?
- D** Is Angela Merkel's leadership at risk?
- E** Why have rating agencies criticized the EU's decisions?

479 A painter can whitewash a surface of 2 m x 12 m in 40 minutes. How long would it take the painter to whitewash a wall of 30mq assuming that he works at the same rate?

- A** 60 minutes
- B** 40 minutes
- C** 45 minutes
- D** 1,2 hours
- E** 50 minutes

480 Find the synonym of the word given.

Bother

- A** Annoy
- B** Link
- C** Gather
- D** Reach
- E** Boring

Read the following passage and answer the given question.

Between the launch in October of Windows 8, accompanied by a \$1.3 billion (£819 million) marketing campaign, the launch of the UK's first 4G mobile network, and the first serious attempt by Google to take on Apple's iPad, it's hard to say what has been the single most important technology product launch of autumn 2012. In fact, it's that multitude of new devices and services that is the most important technology trend in its own right. As internet entrepreneur Jason Calacanis has recently said, it took Apple 25 years to perfect its first computer, five years to make the first iPod "excellent", and just 11 months to perfect the iPad. And it's hard to argue with Calacanis's notion of "Time to excellence": the pace of innovation in consumer technology has never been faster.

481 What's the main focus of the passage?

- A** The launch of the UK's first 4G mobile network
- B** Apple's iPad
- C** The fast pace of innovation in consumer technology
- D** Jason Calacanis's theory
- E** Microsoft's revenues from Windows 8

Read the following passage and answer the given question.

There's a jolt - and passengers on a Qantas A380 en route from London to Sydney are bounced in their seats or sent tumbling in the aisles... Severe turbulence caused by bad weather above the Indian Ocean in January this year resulted in seven people being treated for injuries, with four ending up in hospital. This is not a rare occurrence. Frequent flyers know how unpleasant the irregular, and at times violent, motion of air currents can be. Extreme weather can lead to injuries on board and damage to the plane, resulting in huge costs to airlines. In the worst cases, bad weather can also play a role in a crash.

482 Which one of the following identifies the flaw in this argument?

- A** It assumes that at least one frequent flyer has experienced severe turbulence
- B** It assumes that not one frequent flyer has ever experienced severe turbulence
- C** It assumes that every single frequent flyer has experienced severe turbulence but some may not, actually
- D** It assumes that most of the frequent flyers watch the weather forecast
- E** It assumes that frequent flyers don't watch the weather forecast

Read the following passage and answer the given question.

For some people, nothing gets them ready to take on the day better than a hot cup of coffee. What many don't realize is that, although coffee is not essentially unhealthy, tea can be a better alternative. Although most tea does contain some caffeine, it is full of beneficial nutrients as well. Extensive research has been conducted on the health benefits of tea and coffee. Although research has indicated that coffee does have some health benefits, these are far outweighed by the health benefits of tea. Almost all varieties contain high levels of anti-oxidants, which are nutrients and vitamins that help purge the human body of toxins. Green tea, an extremely popular drink around the world, is perhaps the healthiest variety.

483 According to the information given say which of the following statements is FALSE.

- A** Coffee has some benefits on health
- B** Tea and coffee are not unhealthy
- C** Tea is healthier than coffee
- D** Tea helps the body get rid of toxins
- E** Tea is more unhealthy than coffee

Read the following passage and answer the given question.

The critical issue facing major event host cities is "displacement". Visitors avoid cities for a year before, during and after the event due to fears of over-pricing, overcrowding and an unwelcoming atmosphere. When London won the rights to host the Games in 2005, Visit London and VisitBritain initiated a seven-year stretch of extensive consumer research to understand the scale of the threat and to introduce mitigating campaigns in response. In 2011, Oxford Economic Forecasting estimated that the main threat in the pre-Games period could result in 268,000 lost visitors worth £141m. Data from the Office of National Statistics so far covers January-June. London arrivals during that period were up 2.3 per cent, equalling 150,000 additional visits. Tourism receipts were 7 per cent higher - a £250m increment. It appears that pre-Games displacement was neutralized by the Diamond Jubilee and a programme of exclusive 'limited edition' events, created and promoted specifically to tackle the issue.

484 According to the passage:

- ☐ A visitors are afraid of over-pricing as soon as they feel a city could win the rights to host an event
- ☐ B pre-Games displacement was neutralized by the Office of National Statistics
- ☐ C London won the rights to host both the 2012 Games and the Diamond Jubilee
- ☐ D visitors grew during the January-June period
- ☐ E visitors found an unwelcoming atmosphere in London

Read the following passage and answer the given question.

Branding is a dangerous game. Each evolution of a brand can either result in neutrality, which seems like a waste of money, improvement or a decline in the eyes of the public. Both Coke and Pepsi have sought to redefine their brands in major ways in the last decade. Both saw simplification as the answer and sought to remove the clutter that the previous twenty years had piled on. Pepsi changed everything in a drastic way and took their brand in a completely new direction, even to the point of altering the basic structure and personality of their widely identifiable icon. Though some loved the boldness of the new direction, a huge portion of the media, blog and even public attention given to the refresh questioned Pepsi's strategies and mourned the passing of the old icon.

485 Which one of the following, if true, weakens this argument?

- ☐ A Sales of Pepsi have recently risen
- ☐ B Pepsi is still recognized to be an icon in the world's refreshing drinks industry
- ☐ C Coke is selling more than Pepsi thanks to its new brand
- ☐ D Branding is sometimes an easy game
- ☐ E Pepsi changed only minor details

Read the following passage and answer the given question.

If the player is looking down, the ball will stay on the ground. If the player is looking straight and his eyesight is parallel to the ground, the ball will come fast, and may leave the ground, but only a few inches. If the player's body is slightly leaned back, then the ball is going to rise up off the ground.

486 Which one of the following can be drawn as a conclusion from the above passage?

- ☐ A If the eyesight of the player is parallel to the ground the ball will come slow
- ☐ B If the player is looking down he will score
- ☐ C If the player's body is slightly leaned back the ball will stay on the ground
- ☐ D If the player is looking down the ball won't leave the ground
- ☐ E If the player shoots the last penalty looking down, he will miss it

487 Find the synonym of the word given.

Treatment

- A** Diagnosis
- B** Therapist
- C** Trial
- D** Hospital
- E** Cure

Read the following passage and answer the given question.

All nations will suffer the effects of a world 4C hotter, but it is the world's poorest countries that will be hit hardest by food shortages, rising sea levels, cyclones and drought, the World Bank said in a report published on Monday on climate change. Under the new World Bank president, Jim Yong Kim, the global development lender has launched a more aggressive stance to integrate climate change into development. The report, called Turn Down the Heat, highlights the devastating impact of a world hotter by 4C by the end of the century, a likely scenario under current policies, it said. Climate change is already having an effect: Arctic sea ice reached a record minimum in September, and extreme heat waves and drought in the last decade have hit places like the United States and Russia more often than would be expected from historical records, the report said.

488 According to the World Bank report:

- A** the world's poorest countries will suffer more from the global warming's effects
- B** the world's poorest countries will suffer less from the global warming's effects
- C** arctic sea ice reached a record minimum in July
- D** climate change will have effects only in the far future
- E** the world might be 4C hotter by the end of the century

Read the following passage and answer the given question.

Researchers found that elderly people did worse on thinking tests if they lived in areas with high levels of air pollution, compared to those in areas with relatively clean air. As a result of age-related declines in health and functioning, older adults are particularly vulnerable to the hazards of exposure to unhealthy air. Air pollution has been linked to increased cardiovascular and respiratory problems, and even premature death, in older populations, and there is emerging evidence that exposure to particulate air pollution may have adverse effects on brain health and functioning as well.

489 Which one of the following can be drawn as a conclusion from the passage?

- A** Air pollution is linked to cardiovascular problem in younger people
- B** Air pollution is higher in urban areas
- C** Air pollution is the main cause of premature death
- D** Exposure to air pollution cannot be prevented
- E** Air pollution affects brain health

490 Find the synonym of the word given.

To overwhelm

- A** To understand
- B** To build
- C** To suppress
- D** To test
- E** To overlook

Read the following passage and answer the given question.

Drive west along Italy's Autostrada 24 and you will come to the Gran Sasso mountain range 80 miles before Rome. This is one of Italy's most spectacular national parks and includes the 9,554ft (2,912m) Corno Grande, the highest peak in the Apennines. Bears, wildcats, wolves and chamois make their homes here and every summer thousands of tourists gather to holiday in this glorious, rugged landscape. The mountains hide an intriguing secret, however; one that can be glimpsed from the A24 as it plunges through the 10 km tunnel built beneath Gran Sasso. Half way along, another tunnel branches off from the main road. Should you follow it, you will come to a 4m-high, solid stainless steel door manned by guards. You are now at the threshold of the Gran Sasso National Laboratory, a subterranean lair where physicists are probing the structure of matter and the make-up of the universe. With its labyrinth of tunnels, uniformed guards and glittering racks of equipment, it is one of the world's most spectacular laboratories.

491 Which of the following can reliably be inferred from the information given in the passage?

- A** Corno Grande is the most visited mountain in the Apennines
- B** The Gran Sasso National Laboratory is hidden inside the mountain
- C** Researchers visit the Gran Sasso national park in summer to study the animals that make their home there
- D** It is impossible to reach the Gran Sasso National Laboratory driving the motorway A25
- E** There are lots of similar laboratories all over the world

Read the following passage and answer the given question.

Twenty-five species of monkeys, langurs, lemurs and gorillas are on the brink of extinction and need global action to protect them from increasing deforestation and illegal trafficking. Six of the severely threatened species live in the island nation of Madagascar, off southeast Africa. Five more from mainland Africa, five from South America and nine species in Asia are among those listed as most threatened.

492 In the passage, what does the author hold responsible for the extinction of the species above mentioned?

- A** Deforestation and climate change
- B** Illegal trafficking especially
- C** Reforestation and illegal trafficking
- D** Reforestation and poaching
- E** Poaching and the disappearing of forests

Read the following passage and answer the given question.

Births are becoming more complex. If we look at the age of mothers as an indicator of complexity, then the number of births to women aged over 40 years has increased by more than 50% since the start of the century. With more mothers giving birth later in life, these mothers bring with them greater expectations and aspirations about childbirth. Between 2001 and 2010, the number of births to women aged 40 or over rose by 71%. This ageing of mothers means greater demands on maternity services as pregnancies to older women are more likely to involve complications, which demand more of midwives and others in the maternity team.

493 Which one of the following identifies the flaw in this argument?

- A** It ignores the world's distribution of late pregnancies
- B** It ignores the cultural background of older pregnant women
- C** It does not consider the importance of recent improvements in treatments
- D** It ignores the education of older pregnant women
- E** The situation described dates back to the last decade

Read the following passage and answer the given question.

The United Nations will call on Monday for 2% of worldwide income to be invested in the green economy, a move it says would boost jobs and economic growth. The call is expected to be matched by statements of support for low-carbon investment from heads of state including President of the US and of China, and several chiefs of multinational companies. An investment of 2% of global GDP would more than pay for itself in the form of millions of new jobs, the development of new industries, health benefits from cleaner air, energy efficiency savings and a reduction in greenhouse gas emissions, the UN is expected to say. These findings are also backed up by a report published today by the German government, which warns that Europe will suffer continued low growth rates unless investment in green projects is increased. Raising the level of ambition in the EU's climate targets would increase European GDP by up to \$842bn, a 6% rise, and create up to 6m additional jobs across member states.

494 According to the passage, what is a sufficient condition to create additional jobs?

- (A) Investing in green economy
- (B) Investing part of the GDP in new industries
- (C) Boosting economic growth
- (D) Agreeing on environmental policies
- (E) Increasing global GDP

495 Marco and Carlo play in a soccer game. If the ratio of goals scored by Marco to goals scored by Carlo is 2 to 1, which of the following could NOT be the total number of goals scored by the two boys?

- (A) 3
- (B) 6
- (C) 4
- (D) 9
- (E) 12

496 Find the synonym of the word given.

To fulfil

- (A) To add
- (B) To satisfy
- (C) To confirm
- (D) To reject
- (E) To deny

497 Jimmy made a 15% profit on the sale of a custom designed boat, and the original cost of the boat was \$ 15,000. The boat sold for how much?

- (A) \$ 15,150
- (B) \$ 16,250
- (C) \$ 16,500
- (D) \$ 16,950
- (E) \$ 17,250

498 If David prepares 4 Chinese dishes in one hour and Mary prepares the same number of Chinese dishes in two hours, how many dishes can David and Mary prepare together in half an hour?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

Read the following passage and answer the given question.

Jeans, flip flops and short skirts are just not tennis, Wimbledon officials have decided. Organisers at the All England Club - which has hosted the championships for almost 150 years - have issued a dress code for the first time following concerns that sartorial standards among members are slipping. And just to ensure there is no confusion, they have also provided photographic guidance to hammer home their point. The members' handbook now contains five photographs of an attractive couple illustrating how to avoid the disgrace of being banned from the clubhouse. They are considered to be wearing 'acceptable dress' in just one picture, which appears alongside the words: 'The dress standard for gentlemen is lounge suit or tailored jacket, shirt, tie, trousers and dress shoes. 'Ladies are expected to dress to a similar standard.' The other photographs illustrate 'unacceptable dress'. The various sartorial sins committed include 'T-shirts, distressed jeans and trainers, bare midriffs, jeans and flip flops'.

499 Which one of the following can be drawn as a conclusion from the above passage?

- A** Gentlemen are expected to dress better than ladies
- B** Ladies are expected to dress better than gentlemen
- C** The members' handbook contains seven photographs
- D** Flip flops are unacceptable at the All England Club
- E** All England Club hosted Wimbledon championships for less than a century

500 Find the synonym of the word given.

Thesis

- A** Dispute
- B** Thought
- C** Passage
- D** Theme
- E** Theory

Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta
1	B	2	D	3	B	4	E	5	D	6	A	7	E	8	C	9	C	10	C
11	D	12	C	13	B	14	B	15	C	16	C	17	E	18	A	19	A	20	C
21	D	22	E	23	A	24	A	25	C	26	D	27	C	28	E	29	C	30	A
31	C	32	C	33	B	34	A	35	C	36	D	37	B	38	A	39	D	40	B
41	C	42	E	43	A	44	B	45	C	46	E	47	A	48	B	49	D	50	B
51	E	52	E	53	F	54	A	55	E	56	B	57	C	58	C	59	A	60	A
61	A	62	B	63	C	64	E	65	D	66	A	67	A	68	B	69	B	70	C
71	A	72	B	73	D	74	A	75	B	76	A	77	C	78	B	79	A	80	E
81	A	82	C	83	A	84	D	85	E	86	E	87	B	88	A	89	B	90	B
91	E	92	A	93	A	94	A	95	C	96	B	97	D	98	A	99	B	100	B
101	B	102	A	103	C	104	C	105	E	106	D	107	B	108	C	109	D	110	B
111	C	112	B	113	A	114	A	115	A	116	A	117	A	118	D	119	D	120	E
121	D	122	B	123	C	124	C	125	E	126	A	127	C	128	B	129	C	130	E
131	A	132	D	133	A	134	C	135	C	136	B	137	C	138	C	139	D	140	C
141	A	142	D	143	B	144	C	145	A	146	E	147	C	148	D	149	E	150	C
151	B	152	E	153	C	154	B	155	B	156	C	157	B	158	A	159	D	160	D
161	D	162	B	163	A	164	A	165	D	166	B	167	A	168	D	169	D	170	E
171	A	172	B	173	C	174	B	175	A	176	C	177	D	178	A	179	A	180	C
181	A	182	C	183	D	184	E	185	A	186	B	187	A	188	B	189	B	190	A
191	A	192	E	193	B	194	B	195	B	196	E	197	E	198	A	199	D	200	C
201	A	202	A	203	A	204	B	205	D	206	E	207	E	208	E	209	A	210	A
211	B	212	A	213	C	214	A	215	B	216	E	217	C	218	D	219	D	220	B
221	B	222	E	223	B	224	C	225	E	226	C	227	A	228	D	229	E	230	E
231	C	232	D	233	D	234	C	235	D	236	D	237	A	238	D	239	E	240	A
241	E	242	A	243	B	244	D	245	A	246	E	247	B	248	C	249	D	250	A

Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta
251	C	252	E	253	E	254	E	255	B	256	E	257	D	258	E	259	E	260	C
261	B	262	B	263	E	264	C	265	D	266	D	267	E	268	A	269	B	270	C
271	D	272	A	273	D	274	D	275	C	276	A	277	E	278	A	279	E	280	A
281	D	282	B	283	C	284	B	285	D	286	E	287	D	288	B	289	A	290	D
291	B	292	C	293	C	294	B	295	E	296	D	297	E	298	E	299	D	300	B
301	B	302	A	303	E	304	B	305	C	306	A	307	B	308	D	309	C	310	D
311	E	312	B	313	C	314	D	315	C	316	E	317	C	318	D	319	E	320	A
321	C	322	C	323	B	324	A	325	A	326	C	327	C	328	B	329	D	330	D
331	D	332	A	333	C	334	B	335	E	336	C	337	E	338	C	339	A	340	B
341	A	342	C	343	B	344	E	345	A	346	A	347	E	348	E	349	D	350	A
351	B	352	A	353	E	354	E	355	C	356	C	357	D	358	E	359	B	360	B
361	C	362	C	363	C	364	A	365	A	366	C	367	B	368	B	369	C	370	B
371	A	372	E	373	B	374	A	375	C	376	E	377	B	378	D	379	A	380	A
381	C	382	D	383	C	384	B	385	D	386	A	387	A	388	A	389	C	390	B
391	E	392	A	393	E	394	E	395	E	396	D	397	C	398	B	399	E	400	C
401	C	402	E	403	E	404	D	405	B	406	D	407	A	408	D	409	F	410	C
411	D	412	A	413	A	414	A	415	B	416	E	417	A	418	E	419	B	420	C
421	A	422	D	423	A	424	C	425	E	426	B	427	E	428	D	429	C	430	A
431	C	432	B	433	C	434	D	435	A	436	C	437	E	438	B	439	E	440	D
441	B	442	B	443	B	444	A	445	B	446	C	447	C	448	E	449	D	450	E
451	C	452	D	453	A	454	A	455	B	456	B	457	A	458	A	459	E	460	A
461	A	462	D	463	E	464	A	465	D	466	B	467	E	468	C	469	B	470	A
471	D	472	C	473	C	474	C	475	D	476	B	477	B	478	B	479	E	480	A
481	C	482	C	483	A	484	D	485	B	486	D	487	E	488	A	489	E	490	C
491	B	492	E	493	A	494	A	495	C	496	B	497	E	498	C	499	D	500	E

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Quesiti

501 After the American Revolution, America and Great Britain fought a second war known as the War of:

- A** 1712
- B** 1812
- C** 1912
- D** 1612
- E** 1892

502 In 1926 Germany was allowed to join the:

- A** United Nations
- B** League of Nations
- C** League of Nations
- D** European League
- E** Democratic League

503 Argentin poet and writer Jorge Louis Borges died in:

- A** 1996
- B** 1986
- C** 1966
- D** 1956
- E** 1946

504 An Italian citizen has been denied entry into the USA. Which law has been applied?

- A** Domestic law
- B** International law
- C** Italian law
- D** Private law
- E** International treaty

505 Which of the following countries is a republic?

- A** Andorra
- B** United Kingdom
- C** Liechtenstein
- D** Greece
- E** Denmark

506 Sandro Pertini was President of the Italian Republic in the years:

- A** 1960-1967
- B** 1978-1985
- C** 1971-1977
- D** 1981-1988
- E** 1973-1981

507 What is an expectation that encourages people to behave in a certain way called?

- A Benefit
- B Interest
- C Equity
- D Offer
- E Incentive

508 What is an organization that uses resources to produce a product which it then sells called?

- A Household
- B Market
- C Cost
- D Firm
- E Capital

509 "The Portrait of a Lady" is a novel written by:

- A Herman Melville
- B David Thoreau
- C Charles Dickens
- D Henry James
- E Thomas Hardy

510 Which of the following statements is true?

- A The International Committee of the Red Cross was never awarded the Nobel Peace Prize
- B The International Committee of the Red Cross was awarded the Nobel Peace Prize three times
- C The International Committee of the Red Cross was awarded the Nobel Peace Prize only in 1901
- D The International Committee of the Red Cross was awarded the Nobel Peace Prize five times
- E The International Committee of the Red Cross was awarded the Nobel Peace Prize twice

511 The poem "The Princess" was written and published by Alfred Tennyson in the:

- A 1840s
- B 1650s
- C 1770s
- D 1920s
- E 1580s

512 Which area of Britain grew the most at the time of the first Industrial Revolution?

- A Countryside
- B Coastal ports
- C Urban areas
- D Scotland
- E Wales

513 How many times, in the period 1972-92, was Giulio Andreotti Prime Minister?

- A 4
- B 5
- C 6
- D 7
- E 8

- 514 Which country was a threat to the British industry and power at the outbreak of the 20th century?**
A Japan
B Germany
C Russia
D France
E Italy
-
- 515 Originally painted by Velasquez, "Las meninas" was painted even by:**
A Goya
B Picasso
C El Greco
D Miró
E Dalí
-
- 516 Which of the following Polish politicians received a Nobel Peace Prize?**
A Gomulka
B Wojtyla
C Walesa
D Pilsudski
E Komorowski
-
- 517 The Piccolo Teatro of Milan was built and inaugurated:**
A before the First World War
B before the Second World War
C after the Second World War
D between the two World Wars
E after the end of the Cold War
-
- 518 Sicily is best represented by what shape?**
A Triangle
B Square
C Circle
D Trapezium
E Rectangle
-
- 519 Charging more than maximum legal interest rate is called:**
A detriment
B fraud
C usury
D interest
E benefit
-
- 520 The epic saga "Lord of the Rings" was written by:**
A Alice B. Toklas
B J.R.R. Tolkien
C Andrej Tarkovskij
D Scott Turow
E Junichiro Tanizaki

521 Montevideo lies on which sea?

- A** Atlantic Ocean
- B** Pacific Ocean
- C** Caribbean Sea
- D** Mexico Gulf
- E** Sargasso Sea

522 Which one of the following movies was directed by James Cameron?

- A** *Alien*
- B** *Avatar*
- C** *Minority Report*
- D** *Capricorn One*
- E** *Jurassic Park*

523 Stieg Larsson was a Swedish writer and journalist who became famous worldwide with the:

- A** Century Trilogy
- B** Scandinavian Trilogy
- C** Blomkvist Trilogy
- D** Lisbeth Trilogy
- E** Millennium Trilogy

524 Gustav Klimt lived and worked in the same city as:

- A** Thomas Mann
- B** Johann Wolfgang von Goethe
- C** Albrecht Dürer
- D** Hieronymous Bosch
- E** Sigmund Freud

525 Which of the following novels was written by Ian McEwan?

- A** *Shame*
- B** *The Sense of an Ending*
- C** *Atonement*
- D** *Wolf Hall*
- E** *The Pregnant Widow*

526 Who was Stalin's main target for "removal from power"?

- A** Bucharin
- B** Kamenev
- C** Krusceev
- D** Trotsky
- E** Zinoviev

527 In which Italian region is Bomarzo located?

- A** Abruzzo
- B** Emilia-Romagna
- C** Umbria
- D** Toscana
- E** Lazio

528 What is the right of ownership called?

- A Settlement
- B Benefit
- C Property right
- D Capacity
- E Legality

529 Taking back an offer is called:

- A license
- B counteroffer
- C ratify
- D rescind
- E revocation

530 What length of term does the Italian President of the Republic serve?

- A 5 years
- B 9 years
- C 7 years
- D 10 years
- E 4 years

531 When did Winston Churchill become Prime Minister?

- A December 1939
- B May 1939
- C December 1940
- D May 1940
- E September 1939

532 Economics is primarily concerned with:

- A determining how governments should allocate resources
- B how economic resources are produced
- C how to make a more effective use of resources through reducing wants
- D allocating scarce resources to satisfy consumers' wants
- E maximising profits for governments, consumers and businesses

533 Read the following explanation and find the correct term.

"Policy of openness initiated by Gorbachev in the 1980s that provided increased opportunities for freedom".

- A Detente
- B Containment
- C Freedom Act
- D New Doctrine
- E Glasnost

534 Read the following explanation and find the correct term.

"A policy aimed at providing economic and military support to those European countries which were fighting Communist takeover in the Cold War, especially Greece and Turkey".

- A UN
- B NATO
- C ICBM
- D MEC
- E FMI

535 Pablo Picasso died in:

- A** 1953
- B** 1963
- C** 1973
- D** 1983
- E** 1993

536 Painter Francis Bacon died in 1992 in:

- A** Milan
- B** Moscow
- C** Munchen
- D** Manchester
- E** Madrid

537 Dutch painter Jan Vermeer lived and worked in the:

- A** XIV century
- B** XV century
- C** XVI century
- D** XVII century
- E** XVIII century

538 Which of the following painters was not involved in Surrealism?

- A** Salvador Dali
- B** Joan Miró
- C** Renato Guttuso
- D** René Magritte
- E** Max Ernst

539 Which of the following actresses played the role of Elisabeth I in the biopic directed by Shekhar Kapur?

- A** Nicole Kidman
- B** Juliette Binoche
- C** Uma Thurman
- D** Cate Blanchett
- E** Tilda Swinton

540 Which of the following statements is NOT true?

- A** Rita Levi Montalcini won the Nobel Prize in Medicine
- B** Carlo Rubbia won the Nobel Prize in Medicine
- C** Renato Dulbecco won the Nobel Prize in Medicine
- D** Enrico Fermi won the Nobel Prize in Physics
- E** Dario Fo won the Nobel Prize in Literature

541 Which African country is not landlocked?

- A** Botswana
- B** Zambia
- C** Gabon
- D** Niger
- E** Chad

542 Read the following explanation and find the correct term.
 "An unsuccessful invasion of Cuba by 1,500 Cuban exiles with the US government's support on April 17, 1961".

- A** Bay of Batista
- B** Bay of Eagles
- C** Bay of Pigs
- D** Bay of Coyotes
- E** Bay of JFK

543 William Morris lived and worked under the reign of:

- A** Elisabeth I
- B** Victoria
- C** George VI
- D** Elisabeth II
- E** Henry VIII

544 Which of the following writers had to decline the Nobel Prize in Literature in 1958?

- A** I. Andric
- B** B. Pasternak
- C** A. Camus
- D** F. Mauriac
- E** G. Seferis

545 Which of the following American politicians never received a Nobel Peace Prize?

- A** Martin Luther King
- B** Theodore Roosevelt
- C** Jimmy Carter
- D** Bill Clinton
- E** Barack Obama

546 In Germany, the Spartachistic Uprising (Communists) organised a general strike and occupied public buildings in 1919. They were led by Rosa Luxemburg and:

- A** Karl Kraus
- B** Karl Libeknecht
- C** Friedrich Ebert
- D** Freidrich Nietzsche
- E** Gustav Stresemann

547 Which country claims the highest mountain of the world?

- A** India
- B** Pakistan
- C** Buthan
- D** Bangladesh
- E** Nepal

548 Which of the following politicians received a Nobel Prize in Literature?

- A** F. D. Roosevelt
- B** J. Galsworthy
- C** S. J. Perse
- D** E O'Neill
- E** W. S. Churchill

549 The first Italian to win the Nobel Prize in Physics was:

- A** Enrico Fermi
- B** Antonio Meucci
- C** Guglielmo Marconi
- D** Carlo Rubbia
- E** Riccardo Giacconi

550 The first Italian to win the Nobel Prize in Medicine was:

- A** Camillo Golgi
- B** Agostino Gemelli
- C** Renato Dulbecco
- D** Mario Capecchi
- E** Rita Levi Montalcini

551 What is the approximate population of the United Kingdom?

- A** 42 million
- B** 52 million
- C** 62 million
- D** 35 million
- E** 77 million

552 What is the official capital city of Angola?

- A** Nairobi
- B** Libreville
- C** Luanda
- D** Yaoundé
- E** Bangul

553 Which of the following was the bestselling novel by English writer and traveller Bruce Chatwin?

- A** *In China*
- B** *In Persia*
- C** *Into the Wild*
- D** *Into the Great Wall*
- E** *In Patagonia*

554 What is the official capital city of Belarus?

- A** Praha
- B** Vilnius
- C** Minsk
- D** Kaunas
- E** Smolensk

555 What is the official capital city of Turkey?

- A** Istanbul
- B** Antalya
- C** Izmir
- D** Ankara
- E** Adana

- 556 What is the official capital city of Syria?**
A Baghdad
B Amman
C Iskenderun
D Aleppo
E Damascus
- 557 Which country became independent on July 5, 1962?**
A Algeria
B Chile
C Morocco
D Suriname
E Trinidad and Tobago
- 558 In 2003 Mario Vargas Llosa received the Nobel Prize in Literature. Vargas Llosa is a writer from:**
A Paraguay
B Venezuela
C Uruguay
D Peru
E Chile
- 559 The Nobel Prize was awarded for the first time in:**
A 1900
B 1901
C 1910
D 1911
E 1899
- 560 What city shares the same time zone with Rome?**
A London
B Athens
C Paris
D Cape Town
E Cairo
- 561 Which is the most widespread language in the southern hemisphere?**
A English
B Portuguese
C French
D Spanish
E Dutch
- 562 What country does not lie in the southern hemisphere?**
A Madagascar
B Brasil
C Saudi Arabia
D New Guinea
E Uruguay

563 How many countries are members of NATO?

- A** 25
- B** 21
- C** 27
- D** 28
- E** 19

564 What is the largest economy inside the EU in terms of gross domestic product?

- A** Italy
- B** France
- C** Germany
- D** UK
- E** Spain

565 In economics, which of the following is not a factor of production?

- A** A factory
- B** The fuel used to power industrial machinery
- C** A boat owned by a transport company
- D** Workers in a diner
- E** Wages paid to workers

566 What is an open and peaceful violation of a law to protest its alleged injustice called?

- A** Civil disobedience
- B** Civil disorder
- C** Riot
- D** Independence
- E** Unconstitutional law

567 In economics, what is "microeconomics"?

- A** A period of macroeconomics expansion followed by a period of contraction
- B** An economic system in which a central authority is in command of the economy
- C** An economic system in which decisions regarding investment, production and distribution are based on supply and demand
- D** The study of the economic behaviour and decision making of small units, such as individuals, families and businesses
- E** An economic system in which goods and services are provided for free or at reduced prices

568 What is the approximate population of the European Union?

- A** 265 million
- B** 334 million
- C** 401 million
- D** 502 million
- E** 1 billion

569 Which of the following is a Japanese island?

- A** Sumatra
- B** Luzon
- C** Mainan
- D** Taiwan
- E** Kyushu

- 570 What is the approximate population of Germany?**
A 82 million
B 72 million
C 62 million
D 52 million
E 102 million
- 571 By 1890, what percentage of the earth's population was subject to Queen Victoria?**
A 5%
B 15%
C 55%
D 25%
E 45%
- 572 Italy joined the United Nations in:**
A 1945
B 1965
C 1975
D 1935
E 1955
- 573 Italy joined NATO in:**
A 1945
B 1925
C 1975
D 1955
E 1949
- 574 Libyan rais Muammar Gaddafi was killed near Bengasi in:**
A 2008
B 2009
C 2010
D 2011
E 2012
- 575 Iraqi dictator Saddam Hussein was executed in:**
A 2006
B 2008
C 2010
D 2012
E 2001
- 576 Al Qaeda founder Osama bin Laden was killed by a CIA task force in Pakistan in:**
A 2001
B 2002
C 2011
D 2012
E 2007

577 In 1999 a capital city of central Europe was bombed by NATO air force. Which one of the following?

- A** Bratislava
- B** Budapest
- C** Belgrade
- D** Berlin
- E** Bezan

578 The first International Workingmen's Association was founded in London in:

- A** 1818
- B** 1848
- C** 1889
- D** 1919
- E** 1864

579 The phrase "White Man's Burden" was coined by:

- A** Conad Doyle
- B** Joseph Conrad
- C** Rudyard Kipling
- D** Virginia Woolf
- E** E.M. Forster

580 Which of the following events happened when Carlo Azeglio Ciampi was President of the Italian Republic?

- A** The Anglo-American invasion of Iran
- B** The Anglo-American invasion of Yemen
- C** The Anglo-American invasion of Iraq
- D** The Anglo-American invasion of Serbia
- E** The Anglo-American invasion of Libya

581 The second International Workingmen's Association was founded in 1889 in:

- A** Brussels
- B** Bruges
- C** Bern
- D** Boston
- E** Budapest

582 Which poem was set to music in 1814 and became a patriotic song and later America's national anthem in 1931?

- A** *Howl*
- B** *The Star-Spangled Banner*
- C** *The Raven*
- D** *The Stars over America*
- E** *God save the Queen*

583 Which Asian country was ruled by dictator Pol Pot in the years 1975-78?

- A** Vietnam
- B** Cambodia
- C** Laos
- D** Thailand
- E** Nepal

- 584 **"The Waves" is a novel written by:**
A James Joyce
B Virginia Woolf
C Joseph Conrad
D W. B. Yates
E Oscar Wilde
- 585 **"A Passage to India" is a novel written by:**
A Ted Hughes
B Rudyard Kipling
C Arthur Conan Doyle
D Joseph Conrad
E E.M. Forster
- 586 **"Lady Chatterly Lover" is a novel written by:**
A Lawrence Durrell
B Thom Gunn
C D.H. Lawrence
D T.S. Elliot
E Evelyn Waugh
- 587 **"Murder in the Cathedral" is a play written by:**
A T.S. Elliot
B W.B. Yates
C V.S. Naipaul
D E.M. Forster
E D.H. Lawrence
- 588 **"Waiting for Godot" is a play written by:**
A Eugène Ionesco
B Harold Pinter
C Alan Bennett
D Samuel Beckett
E Oscar Wilde
- 589 **George Bernard Shaw was an influent member of the Fabian Society and:**
A a Welsh playwright
B a Scottish playwright
C an Irish playwright
D an English playwright
E a German playwright
- 590 **"The Dark Tower" is a popular series of novels by:**
A Tom Clancy
B Stephen King
C James Patterson
D John Grisham
E Ken Follett

591 What are rules and procedures established by regulatory agencies called?

- A** Administrative law
- B** Statutes
- C** Common law
- D** Law of precedent
- E** Commercial law

592 "The Corrections" is a novel written by:

- A** Jonathan Harr
- B** Jeffrey Eugenides
- C** Jonathan Franzen
- D** John Irving
- E** Joanne Harris

593 "The Road" is a novel written by:

- A** Don DeLillo
- B** Cormac McCarthy
- C** Michael Chabon
- D** Denis Johnson
- E** Toni Morrison

594 Which of the following EU countries is a monarchy?

- A** Malta
- B** Austria
- C** Bulgaria
- D** Romania
- E** Spain

595 The "Cantos" were written by:

- A** Pablo Neruda
- B** Milan Kundera
- C** Boris Vian
- D** Ezra Pound
- E** Walt Whitman

596 Which of the following statements is correct?

- A** Human capital should not be considered a factor of production
- B** The financial gain made in a transaction is called profit
- C** Good and service are synonyms
- D** Money is never a factor of production
- E** In a competitive market there are lots of buyers and few sellers

597 "Au Moulin Rouge" was painted by:

- A** Toulouse-Lautrec
- B** Courbet
- C** Degas
- D** Derain
- E** Tournier

598 Which of the following novels was written by Salman Rushdie?

- A** *The Master*
- B** *Shalimar the Clown*
- C** *The Innocent*
- D** *Arthur & George*
- E** *The Forgotten Garden*

599 The Guggenheim Museum of Bilbao was built and inaugurated:

- A** before the Falklands-Malvinas War
- B** before the 9/11 attacks
- C** before the Iran-Iraq War
- D** between the two World Wars
- E** before the end of the Cold War

600 David Foster Wallace died in 2008. His most remarkable book is the novel:

- A** *Infinite Jest*
- B** *Tree of Smoke*
- C** *Underworld*
- D** *Zeitoun*
- E** *Emerald City*

Soluzioni

Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta
501	B	502	C	503	B	504	A	505	D	506	B	507	E	508	D	509	D	510	B
511	A	512	C	513	D	514	B	515	B	516	C	517	C	518	A	519	C	520	B
521	A	522	B	523	E	524	E	525	C	526	D	527	E	528	C	529	E	530	C
531	D	532	D	533	E	534	B	535	C	536	E	537	D	538	C	539	D	540	B
541	C	542	C	543	B	544	B	545	D	546	B	547	E	548	E	549	C	550	A
551	C	552	C	553	E	554	C	555	D	556	E	557	A	558	D	559	B	560	C
561	B	562	C	563	D	564	C	565	E	566	A	567	D	568	D	569	E	570	A
571	D	572	E	573	E	574	D	575	A	576	C	577	C	578	E	579	C	580	C
581	A	582	B	583	B	584	B	585	E	586	C	587	A	588	D	589	C	590	B
591	A	592	C	593	B	594	E	595	D	596	B	597	A	598	B	599	B	600	A

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601 The active X factor catalyzes the conversion of:

- A** prothrombin into fibrin
- B** prothrombin into thrombin
- C** prothrombin into fibrinogen
- D** fibrinogen into fibrin
- E** thrombin into fibrinogen

602 What can the addition of fatty acids to an alcohol directly produce?

- A** a lipid
- B** an amino acid
- C** ethanoic acid
- D** ascorbic acid
- E** glycoprotein

603 Which of the following molecules contain only carbon, hydrogen and oxygen?

- 1. cellulose**
- 2. haemoglobin**
- 3. amylase**
- 4. a triglyceride**
- 5. DNA**

- A** 1 and 4 only
- B** 2 and 5 only
- C** 3 and 5 only
- D** 1 and 3 only
- E** 2 and 4 only

604 In a reflex arc that comprises a pain receptor cell in the skin, three neurones and a muscle (effector), the number of synapses found in the central nervous system (CNS) is:

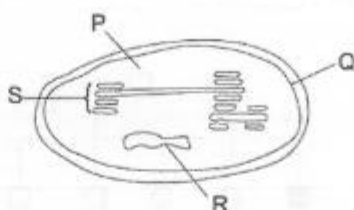
- A** 1
- B** 2
- C** 3
- D** 4
- E** 5

605 Heart cells must contract in synchrony to produce an effective heart beat. The electrical signal telling each cell to contract must reach every cell of the heart at the same time. What kind of cell-to-cell junctions would you expect to find in heart tissue?

- A** Gap junctions
- B** Cell fusion
- C** Adherens junctions
- D** Desmosome
- E** Tight junctions

- 606** Mendel, in his breeding experiments, examined the F_1 and the F_2 generations. This was experimentally important because:
- A** some of the parental traits reappeared in the F_2 , suggesting that the traits were not truly disappeared in the F_1
 - B** the F_1 progeny was made up by very few individuals, making statistical analysis difficult
 - C** the recessive phenotypes were visible in both the F_1 and the F_2 generation
 - D** analysis of the F_2 allowed him to discover the gene linkage
 - E** the dominant phenotypes were visible only in the F_2 generation, suggesting linkage between the dominant and the recessive alleles
- 607** In the duodenum, the bolus is transformed by gastric juice, pancreatic juice and bile in a milky liquid called:
- A** chyle
 - B** chyme
 - C** choledoch
 - D** chylomicron
 - E** feces
- 608** Which of the following statements about an individual whose genotype is heterozygous for gene X is/are true?
1. He can pass allele X or x to its offspring
 2. Each of its somatic cells possesses alleles X and x
 3. Half of its gametes contains allele X
- A** 1 and 2 only
 - B** All
 - C** None
 - D** 2 and 3 only
 - E** 1 and 3 only
- 609** In recombinant DNA experiments, _____ is used to cut pieces of DNA, and _____ joins these segments to form recombinant DNA.
- A** a restriction enzyme - DNA ligase
 - B** a transposon - a restriction enzyme
 - C** a plasmid - DNA ligase
 - D** DNA ligase - a restriction enzyme
 - E** a transposon - a plasmid
- 610** Wound licking is an instinctive response in many animals. Accordingly, saliva contains many antibacterial factors, among which there are:
- A** lysozyme and pepsin
 - B** lysozyme and ptialin
 - C** pespsin and IgA
 - D** ptialin and IgA
 - E** lysozyme and IgA

611 The diagram below shows a chloroplast.



Which row of the table correctly identifies the site of light-dependent reaction and the site of light-independent reaction?

row	Site of light-dependent reaction	Site of light-independent reaction
1	s	p
2	p	q
3	s	r
4	q	s
5	r	p

- A row 1
- B row 2
- C row 3
- D row 4
- E row 5

612 What is the name of the point where the esophagus passes through the diaphragm?

- A Greater omentum
- B Lesser omentum
- C Hiatus
- D Pylorus
- E Chimo

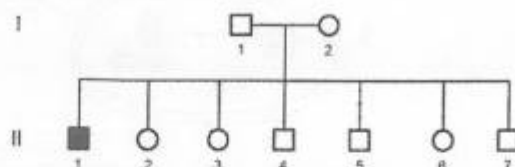
613 An organism's fitness in evolutionary terms is measured by its:

- A genetic variability
- B contribution to the gene pool of the next generation
- C stability in the face of environmental change
- D health
- E mutation rate

614 Which of the following is a polysaccharide?

- A Sucrose
- B Glucose
- C Galactose
- D Lactose
- E Cellulose

- 615 The following pedigree shows a family with a sex-linked recessive disease. Which of the following statements is most correct?



- A All the females of generation II are symptom-free carriers
 - B The male of generation I is a symptom-free carrier
 - C All the females in the pedigree are symptom-free carriers
 - D Male 1 in generation II is a symptom-free carrier
 - E Female 6 in generation II could be a symptom-free carrier
- 616 Which of the following formed elements of blood do not contain a nucleus?

1. Monocytes
2. Lymphocytes
3. Platelets
4. Erythrocytes

- A Both 2 and 3
- B Both 1 and 2
- C Both 1 and 3
- D Both 3 and 4
- E 1, 3 and 4

- 617 The autonomic nervous system:

- A is not controlled by hypothalamus
- B does not control skeletal muscles
- C controls smooth and cardiac muscles exclusively
- D is divided into sympathetic and parasympathetic nervous systems, that respond to resting and stressing conditions respectively
- E does not comprehend motor neurons

- 618 In a diploid organism, most genes come in alternative forms called _____. The genetic makeup of an organism is said to be the _____ and the organism with two identical versions of a gene is said to be _____.

- A Alleles, homozygous, genotype
- B Haploids, genotype, homozygous
- C Alleles, genotype, homozygous
- D Alleles, genotype, heterozygous
- E Genotypes, phenotype, homozygous

- 619** Collagen is the most abundant protein in mammals and it is found in the connective tissue. Which of the following cells produce collagen?
- A** Mast cells
 - B** Granulocytes
 - C** Leucocytes
 - D** Fibroblast
 - E** Neurons
-
- 620** The grey colour in hens occurs in the heterozygous offspring of white and black individuals. Which of the following crosses would produce an offspring in the ratio of 1 white : 2 grey : 1 black?
- A** Black x white
 - B** Grey x white
 - C** Grey x grey
 - D** Black x grey
 - E** White x white
-
- 621** Which of the following is/are true about the phenotype of an organism?
1. It can be homozygous or heterozygous
 2. It is always diploid
 3. It depends at least in part on the genotype
 4. It depends at least in part on the environmental influences
- A** 3 and 4 only
 - B** 1, 3 and 4 only
 - C** 3 only
 - D** 2 and 3 only
 - E** 1 and 4 only
-
- 622** Which two of the following are final products of glycolysis?
1. phosphorylated triose
 2. ATP
 3. NAD
 4. pyruvate
- A** 2 and 4
 - B** 1 and 3
 - C** 2 and 3
 - D** 1 and 4
 - E** 3 and 4
-
- 623** Leukemia:
- A** is a solid tumour
 - B** is characterized by an abnormal increase of immature blasts
 - C** is due to a defect in lymphocytes B activation
 - D** is never caused by DNA mutations
 - E** is not a neoplasia

624 Which of the following are the best conditions for diffusion to take place?

- A** Large surface area, high concentration gradient
- B** Small surface area, high concentration gradient
- C** Large surface area, no concentration gradient
- D** Small surface area, low concentration gradient
- E** Large surface area, low concentration gradient

625 Why is Louise Joy Brown famous?

- A** She is known for the development of in vitro fertilization
- B** She is the first person to have been conceived by in vitro fertilization
- C** She sequenced for the first time the *Neanderthal* genome
- D** She is the first woman to win a Nobel Prize
- E** She won the Nobel Prize for Physics in 1903

626 Hyperpolarization of cell membrane potential:

- A** can be caused by the influx of sodium ions by the sodium-potassium pump
- B** can be caused by the influx of potassium ions by potassium channels
- C** can be caused by the efflux of potassium ions by the sodium-potassium pump
- D** can be caused by the influx of chloride ions by chloride channels
- E** varies between -50 mV and -70 mV

627 If the eyepiece lens of a light microscope magnifies 10 times, what objective lens will give x400 magnification?

- A** x0.4
- B** x4
- C** x40
- D** x400
- E** x4000

628 Which of the following statements about Mendel's breeding experiments is NOT true?

- A** The F_2 progeny showed two phenotypes, each resembling one of the parental phenotypes
- B** The F_1 individuals had all the same genotype
- C** The parental individuals were all true-breeding
- D** One of the parental phenotypes appeared only in the F_2 progeny, not in the F_1
- E** The phenotype of the F_1 progeny was intermediate between the two parental phenotypes

629 Which of the following is/are true regarding sensory receptors?

1. They can transduce mechanical stimuli into electric signals
 2. They can transduce the binding of a neurotransmitter into electric signals
 3. They can transduce the binding of a chemical into electric signals
 4. They can trigger an action potential in the cell
- A** 1 only
 - B** 2 only
 - C** 1 and 2 only
 - D** 1, 2 and 3 only
 - E** 1, 3 and 4 only

- 630 The axial skeleton is formed by:**
- the vertebral column (26 bones), the rib cage (12 pairs of ribs and the sternum) and the skull (22 bones and 7 associated bones)
 - 90 bones
 - pectoral girdles (4 bones), the upper limbs (60 bones), the pelvic girdle (2 bones), and the lower limbs (60 bones)
 - the vertebral column (26 bones) and the lower limbs (60 bones)
 - only the vertebral column (26 bones)
- 631 The endothelial cell (EC) surface in an adult human is composed of approximately 1 to 6×10^{13} cells, weighs approximately 1 kg, and covers a surface area of approximately 1 to 7 m². The cells observed in the endothelium are:**
- simple squamous epithelial cells
 - simple cuboidal cells
 - stratified squamous keratinizing cells
 - pseudostratified cells
- Only 1
 - Only 2
 - Only 3
 - Only 4
 - All the above
- 632 All are true for DNA polymerase except one:**
- has exonuclease activity
 - works only in 5' to 3' direction
 - edits as it synthesizes
 - synthesizes RNA primer to initiate DNA synthesis
 - uses deoxyribonucleotides
- 633 Which of the following is/are true about the offspring of a Ff x Ff cross?**
- 1/4 of the offspring will have genotype FF
 - 1/2 of the offspring will have genotype Ff
 - 3/4 of the offspring will have the dominant phenotype
 - 1/3 of the offspring will have genotype ff
- 1 and 3 only
 - 1 and 2 only
 - All are true
 - 1, 2 and 3 only
 - 2, 3 and 4 only
- 634 Which one of the following is NOT true of human hormones?**
- They are all chemicals
 - Some, such as testosterone and oestrogen, can be steroids
 - They travel at the speed of blood flow
 - A hormone may affect one or more structures in the body
 - They are all released from glands and flow down ducts into the bloodstream

635 In which of the following stages can chromatids be present?

1. the start of mitosis
2. the start of meiosis I
3. the end of cytokinesis

- A 1 and 2 only
- B 1, 2 and 3
- C 1 and 3 only
- D 2 and 3 only
- E 3 only

636 What's the name of the protective membrane that surrounds the heart externally?

- A Endocardium
- B Mediastinum
- C Pericardium
- D Pleura
- E Paracardio

637 What is the expected phenotypes ratio of the offspring of a $Cc \times Cc$ cross?

- A 1:2:1
- B 2:1:2
- C 1:3
- D 1:2
- E 9:3:3:1

638 Goitre is an enlargement of the:

- A thyroid
- B elbow
- C knee
- D tonsils
- E kidney

639 Who is Frederick Sanger?

- A A British biochemist
- B He won the Nobel Prize for Chemistry twice
- C He created the first cell with a synthetic genome
- D He was the founder of medical microbiology
- E Both A and B

640 Drugs that either stabilize or depolymerize microtubules can be used in cancer chemotherapy. Which of the following is correct concerning such drugs?

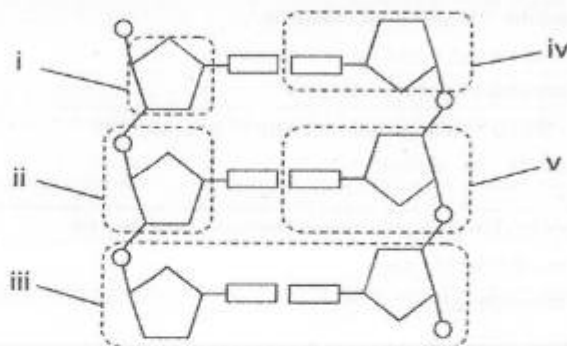
- A They stimulate the immune system
- B They prevent chromatin condensation
- C They prevent movement of tumor cells into other tissues
- D They interfere with mitosis
- E They interfere with endocytosis

- 641** How many kinds of gametes can be produced by an organism having genotype AaBb, if genes A and B are on different chromosomes?
- A** 2
 - B** 4
 - C** 6
 - D** 8
 - E** It depends on how many gametes are produced by the organism
-
- 642** Which of the following is mismatched?
- A** Fungal genome - circular DNA molecule
 - B** Gene - unit of heritable biological information
 - C** Sex chromosome in humans - X and Y
 - D** Genome - the complete genetic makeup of an organism
 - E** Human somatic cell - diploid
-
- 643** The difference in skin colour between individuals is due to:
- A** the number of melanocytes
 - B** the level of activity of melanocytes
 - C** the thickness of derma
 - D** both A and C
 - E** the colour of myelin
-
- 644** Genes A and B are on different chromosomes. What fraction of the offspring of the cross AaBb x AaBb will be homozygous for all the dominant alleles?
- A** 1/64
 - B** 3/9
 - C** 1/32
 - D** 1/16
 - E** 1/9
-
- 645** In normal conditions, an immune response is activated:
- A** only against pathogenic microorganisms
 - B** against all the antigens recognized as non-self
 - C** against all the bacteria that enter human body
 - D** against circulating antibodies
 - E** none of the above
-
- 646** By which process does a glucose molecule move through a cell membrane from a region of greater concentration to one of lower concentration?
- A** Diffusion
 - B** Facilitated diffusion
 - C** Osmosis
 - D** Active transport
 - E** Filtration

647 *Helicobacter pylori* is thought to be the causative agent of:

- A celiac disease
- B cirrhosis of the liver
- C gastritis
- D peritonitis
- E gastric ulcer

648 Which one of the following labels, i to v, represents a nucleotide?



- A i
- B ii
- C iii
- D iv
- E v

649 Which of the following is/are true about hydrogen bonds between water molecules?

1. They are weak bonds.
2. They are strong bonds.
3. They are temporary bonds.
4. They require hydrolysis to break.

- A 1 only
- B 1 and 3 only
- C 2 and 3 only
- D 1 and 4 only
- E 2 and 4 only

650 The subdivision of the large drops of fat in numerous smaller droplets soluble in the intestine is mediated by:

- A bile salts
- B lipase
- C trypsin and chymotrypsin
- D pancreatic juice
- E pancreatic amylase

651 In genetic studies what does the acronym "SNP" stand for?

- A Peripheral Nervous System
- B Single Nucleotide Polymorphism
- C Principal Sequence
- D Sequence Not Published
- E Short Nucleotide Polymorphism

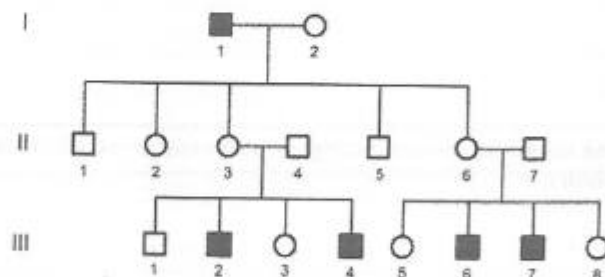
652 Which statement best fits the definition of a test cross?

- A A particular genetic cross in which the individual in question is crossed with an individual homozygous for a recessive trait
- B A particular genetic cross in which the individual in question is crossed with an heterozygous individual
- C A particular genetic cross in which two heterozygous individuals are mated
- D A particular genetic cross to test if the individual in question is homozygous for the recessive trait
- E A cross between two individuals where genetic traits are followed across generations

653 Which of the following clues would tell you whether a cell is prokaryotic or eukaryotic?

- A The presence or absence of a rigid cell wall
- B Whether or not the cell is partitioned by internal membranes
- C The presence or absence of ribosomes
- D Whether or not the cell carries out cellular metabolism
- E Whether or not the cell contains DNA

654 The following pedigree shows the heredity of a sex-linked trait. Which of the following statements is most correct?



- A Female 6 of generation II is homozygous
- B Male 4 of generation II is heterozygous
- C Male 2 of generation III is homozygous
- D Male 4 of generation III has a dominant phenotype
- E Female 3 of generation II is heterozygous

655 Where is the epiglottis?

- A In the pharynx
- B In the larynx
- C In the esophagus
- D In the stomach
- E In the mouth

656 Which of the following statements is true regarding the protein p53?

1. p53 is an oncogene
2. p53 is mutated in many tumour types
3. p53 can inhibit abnormal cell proliferation

- A Only 1 and 3
- B Only 2
- C Only 2 and 3
- D 1, 2 and 3
- E Only 1

657 Which row of the table correctly reports the differences between innate and adaptive immune response?

		Activity	Response	Specificity	Memory
1	Innate	Always present	Slower	Lower	No
2	Innate	Normally silent	Slower	Higher	Yes
3	Adaptive	Normally silent	Quicker	Higher	Yes
4	Adaptive	Always present	Quicker	Higher	Yes
5	Adaptive	Normally silent	Slower	Higher	Yes

- A Row 3
- B Row 1
- C Row 4
- D Row 5
- E Row 2

658 Which of the following mineral nutrients is directly involved in light absorption during photosynthesis?

- A Zn^{2+}
- B Mn^{2+}
- C Cu^{2+}
- D Mg^{2+}
- E Ca^{2+}

659 Which of the following statements about muscle contraction is true?

- A The hydrolysis of ATP (adenosine triphosphate) to ADP (adenosine diphosphate) provides energy to the process
- B The binding of Ca^{2+} to troponin exposes the active sites on actin and allows myosin head to grab onto actin
- C Both A and B
- D The contraction can be initiated only consciously
- E Contraction does not occur in smooth muscles

660 In case of high blood sugar, what is the role of the liver?

- A** It converts glycogen into glucose
- B** It converts glucose into glycogen
- C** It increases urea production
- D** It increases bilirubin production
- E** The liver is not involved in the regulation of blood glucose

661 The fact that many forms of aquatic animals look alike even though they had diverse ancestors can be attributed to:

- A** convergent evolution
- B** divergent evolution
- C** development of geographic races
- D** chance alone
- E** interspecies breeding

662 In mice, short hair is dominant to long hair. A homozygous short-haired mouse is crossed with a long-haired mouse, and one of their offspring is test crossed. Which proportion of the offspring resulting from this test cross is expected to have long hair?

- A** 2/2
- B** 1/4
- C** 3/4
- D** 2/3
- E** 1/2

663 The first metabolic intermediate that is common to the aerobic metabolism of glucose and fatty acids is:

- A** acetyl CoA
- B** beta-hydroxybutyrate
- C** pyruvate
- D** citrate
- E** glyceraldehyde 3-phosphate

664 Which row of the table correctly identifies a blood vessel that has a low concentration of carbon dioxide and a vessel that has a low concentration of urea?

	low carbon dioxide	low urea
Row 1	renal vein	pulmonary artery
Row 2	pulmonary vein	renal vein
Row 3	renal artery	pulmonary vein
Row 4	pulmonary vein	renal artery
Row 5	pulmonary artery	renal vein

- A** Row 1
- B** Row 2
- C** Row 3
- D** Row 4
- E** Row 5

665 Where are pressure sensors involved in the regulation of blood pressure localized?

1. In the right atrium
2. In the left atrium
3. In the aortic arch
4. In the carotid artery

- A Only 1
- B Only 3
- C 3 and 4
- D 1 and 2
- E 2 and 3

666 Which of the following statements about the myometrium is true?

- A It consists of a thick layer of muscle cells
- B It is an internal mucosa that cyclically changes during the menstrual cycle
- C It is the channel in which sperms are deposited
- D It consists of cells that protect the immature egg cells
- E It is delegated to estrogen production

667 A restriction enzyme cuts DNA. It makes a sticky end of CTGAT. How many hydrogen bonds are broken to make this sticky end?

- A 12
- B 13
- C 15
- D 10
- E 26

668 What is the book that states Darwin's theory of evolution based on natural selection?

- A *On the Origin of Species*
- B *Traité des plantes usuelles*
- C *The Genetical Theory of Natural Selection*
- D *Adaptation and Natural Selection*
- E *Zoological Philosophy*

669 Which of the following is not part of the *lac* operon of *E. coli*?

- A Genes for inducible enzymes of lactose metabolism
- B Genes for the repressor, a regulatory protein
- C Gene for RNA polymerase
- D The promoter, the RNA polymerase binding site
- E The operator, the repressor binding site

670 Gene expression can be regulated by:

- A RNA polymerase
- B rough endoplasmic reticulum
- C the position of the genes on the alleles
- D transcription factors
- E DNA replication factors

- 671 Centrioles are structures found:**
- A** in prokaryotic cells
 - B** in eukaryotic cells
 - C** only in animal cells
 - D** only in plant cells
 - E** in both prokaryotes and eukaryotes
-
- 672 Watson and Crick are two famous scientists who discovered:**
- A** the structure of RNA in 1987
 - B** the mechanism of RNA interference in 1999
 - C** the structure of proteins in 1972
 - D** the structure of DNA in 1953
 - E** the DNA in 1953
-
- 673 T lymphocytes maturation:**
- A** occurs in the red marrow
 - B** occurs in the spleen
 - C** occurs every time the cell meets an antigen
 - D** requires DNA recombination events
 - E** is stimulated by B lymphocytes maturation
-
- 674 Joints are structures that connect single bones and allow them to move against each other allowing movement. There are two functional divisions of joints, diarthrosis and synarthrosis. Which is the main difference between them?**
- A** Diarthroses allow extensive mobility while synarthrosis are immovable or allow only little movements
 - B** Synarthrosis are synovial joints and diarthrosis are fibrous joints
 - C** Shoulder and hips are synarthrosis and skull sutures are diarthroses
 - D** Both A and C
 - E** Both B and C
-
- 675 Cyclins are proteins involved in regulation of:**
- A** cell-cycle protein kinases
 - B** circadian rhythms
 - C** synthesis of cAMP
 - D** membrane circulation via exocytosis and endocytosis
 - E** the cycling of tubulin subunits through microtubules
-
- 676 Which of the examples of homeostasis does/do NOT require the brain to be involved in the control process?**
1. Temperature regulation
 2. Osmoregulation (regulation of the water content of blood)
 3. Blood glucose concentration regulation
- A** 1 only
 - B** 2 only
 - C** 3 only
 - D** 1 and 2 only
 - E** 2 and 3 only

677 A true-breeding cattle with red coat colour is crossed with a true-breeding and white coloured individual. All the progeny has roan coat colour (mixed red and white hairs). This is an example of:

- A** pleiotropy
- B** codominant inheritance
- C** dominance
- D** epistasis
- E** multiple alleles

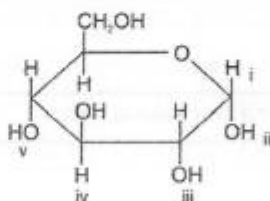
678 Which of the following statements about mitochondrial proteins is true?

- A** All mitochondrial proteins are coded for and synthesized in the mitochondria
- B** Some mitochondrial proteins are coded for and synthesized in the mitochondria, and others are imported from the cytoplasm
- C** All mitochondrial proteins are imported from the cytoplasm
- D** Mitochondrial proteins arise from other mitochondrial proteins
- E** All mitochondrial proteins are enzymes

679 Dolly was cloned by Ian Wilmut, Keith Campbell and colleagues at the Roslin Institute and the biotechnology company PPL Therapeutics near Edinburgh in Scotland. Which of the following sentences is true?

- A** Dolly was a male domestic sheep
- B** Dolly was the first mammal to be cloned from an adult somatic cell
- C** Dolly was cloned using the process of artificial twinning
- D** On 14 February 2005, Dolly was euthanized
- E** All of the above sentences are false

680 If a glucose molecule became incorporated as a non-terminal component of starch, which two regions, labelled i to v, would be involved in forming glycosidic bonds?



- A** i and iii
- B** i and iv
- C** ii and v
- D** ii and iv
- E** iii and v

681 Which one of the following is NOT correct about the myelin sheath?

- A** It is mainly composed of phospholipids and proteins
- B** It wraps around the axon of all neurons
- C** It increases the action conduction velocity
- D** It insulates the axon and prevents the transfer of ions between the inner and the outer of the cell
- E** It is periodically interrupted by gaps called nodes of Ranvier

- 682 An albino person is homozygous for the recessive allele of a gene controlling the synthesis of melanin. A normally pigmented couple has an albino child. What is the probability that the next child will be normally pigmented?

A 50%
 B 75%
 C 0%
 D 100%
 E 25%

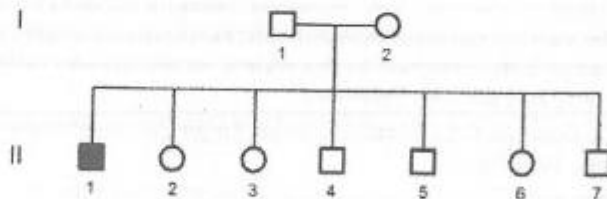
- 683 If a DNA molecule has a 58% content of A-T base pair, find the respective percentages of the four bases (A, T, G, C).

A 21%, 29%, 29%, 21%
 B 21%, 21%, 29%, 29%
 C 23%, 23%, 27%, 27%
 D 29%, 29%, 21%, 21%
 E 25%, 25%, 25%, 25%

- 684 In cocker spaniels, solid colour (S) is dominant over spotted colour (s). If an individual with solid colour is crossed with a spotted individual, and the offspring shows both solid and spotted colours, one can conclude that:

A the parent with solid colour is homozygous
 B the parent with solid colour is heterozygous
 C the offspring individuals with spotted colour are heterozygous
 D the parent with spotted colour is heterozygous
 E some mutants unexpectedly appeared in the offspring

- 685 The following pedigree shows a family with a dominant autosomal disease. Which of the following statements is most correct?



A A new mutation hit one of the gametes that fused to make up male 1 of generation II
 B This gene shows maternal inheritance
 C Female 6 in generation II is a symptom free carrier
 D The inheritance pattern of this pedigree cannot be explained
 E Female 6 in generation II could be a symptom-free carrier

- 686 What percentage of homozygous offspring will be obtained from the mate $Ww \times Ww$?

A 0%
 B 25%
 C 50%
 D 75%
 E 100%

687 The chemical in environmentally unfriendly detergents that promote water plant growth in our rivers is:
A sulphur **B** soap **C** carbon **D** nitrate **E** phosphate

688 Which of the following statements is/are true for an autosomal recessive allele to determine a disease?

1. Every diseased person has a diseased parent
2. Two diseased parents have only diseased children
3. Every diseased parent has affected children
4. There can be persons who are healthy carriers

- A** 1, 2 and 4 only
B 2 and 4 only
C 2, 3 and 4 only
D 1 only
E 2 only

689 The hormonal control of renal function reacts to a liquid loss by:

- A** decreasing ADH production
B decreasing aldosterone production
C increasing ADH production
D increasing Insuline production
E secreting renin

690 Read the text below and mark only the correct answer about it.

"Infectious diseases are responsible for an overwhelming number of deaths worldwide and their clinical management is often hampered by the emergence of multi-drug-resistant strains. Therefore, prevention through vaccination currently represents the best course of action to combat them. However, immune escape and evasion by pathogens often render vaccine development difficult. Furthermore, most currently available vaccines were empirically designed. In this review, we discuss why rational design of vaccines is not only desirable but also necessary."

Rueckert C., Guzmán C.A., "Vaccines: From Empirical Development to Rational Design", PLoS Pathog., 2012 Nov 8.

- A** Multi-drug-resistant strains are a consequence of vaccine failure
B Vaccination is a form of prevention
C Infectious disease can be treatead only using vaccine
D Immune escape and evasion by pathogens may help vaccine developement
E Both B and C

691 The mesoderm is one of the three primary germ cell layers in the very early embryo. Which of the following tissues/organs derive from it?

- A** Cardiovascular system, pancreas and lungs
B Epidermis, kidneys and neuronal system
C Cardiovascular system, muscles, genitourinary system, bones and kidneys
D Endoderm and ectoderm
E Cardiovascular system, muscles, genitourinary system, bones and liver

- 692 Gluconeogenesis:**
 A is another term for glycogenesis
 B is stimulated by insulin
 C is stimulated by glucagon produced by adrenal glands
 D is stimulated by glucocorticoids
 E occurs in plants but not in animals
-
- 693 What is the main feature of the pulmonary alveolus?**
 A It facilitates the exchange of nutrients between blood and lungs
 B It facilitate the exchange of gases between blood and lungs
 C It is poorly vascularized
 D Its walls are composed of ciliated cells
 E Its walls are constituted by cells secreting mucus
-
- 694 A dominant trait in humans are the unattached earlobes. Two parents have unattached earlobes, but their daughter does not. What is the probability that a second child will have attached earlobes?**
 A 0%
 B 25%
 C 50%
 D 75%
 E 100%
-
- 695 Membrane carrier proteins differ from membrane channel proteins by which of the following characteristics?**
 A Carrier proteins are glycoproteins, while channel proteins are lipoproteins
 B Carrier proteins transport molecules down their electrochemical gradient, while channel proteins transport molecules against their electrochemical gradient
 C Carrier proteins can mediate active transport, while channel proteins cannot
 D Carrier proteins do not bind to the material transported, while channel proteins do
 E Carrier proteins are synthesized on free cytoplasmic ribosomes, while channel proteins are synthesized on ribosomes bound to the endoplasmic reticulum
-
- 696 A synthetic mRNA of repeating sequence 5'-CACACACACACACACA... is used for a cell-free protein synthesizing system like the one used by Nirenberg. If we assume that protein synthesis can begin without the need for an initiator codon, what product or products would you expect to occur after protein synthesis?**
 A One protein, consisting of a single amino acid
 B Three proteins, each consisting of a different, single amino acid
 C Two proteins, each with an alternating sequence of two different amino acids
 D One protein, with an alternating sequence of three different amino acids
 E One protein, with an alternating sequence of two different amino acids
-
- 697 Which of the following sentences regarding bone tissue is NOT true?**
 A It is a connective tissue
 B Parathormone regulates blood calcium levels
 C Osteons are the anatomical and functional unit of bones
 D Osteoclasts activity regulates blood calcium levels
 E Yellow bone marrow consists mainly of hematopoietic tissue

- 698** Which of the following statements regarding adrenalin and noradrenalin is NOT true?
1. They stimulate the fight-or-flight response
 2. They stimulate an increase in glucose blood levels
 3. They are secreted by adrenal glands
 4. They are steroid hormones
- A** Only 1
B Only 4
C 3 and 4
D 2 and 4
E Only 2
- 699** Oxygen-rich blood is transported:
- A** in the arteries from the heart to the periphery
B in the arteries, from the periphery to the heart
C in the veins, from the heart to the periphery
D in the veins, from the periphery to the heart
E none of the above
- 700** The genetic disease blue sclera is determined by an autosomal dominant allele; individuals carrying this allele have bluish sclera. However, 35% percent of individuals with bluish sclera have both parents with a normal sclera. How could this be explained?
- A** The allele determines its phenotype only when present in two copies
B At least one of the parents was a symptom-free carrier
C The gene locus is on mitochondrial DNA
D The gene locus is on Y chromosome
E De novo mutations swap the recessive allele for the dominant allele
- 701** Antibiotics are becoming less effective due to:
- A** people becoming immune to them
B people becoming resistant to them
C artificial selection
D people not finishing the full course
E new antibiotics being available
- 702** How is it called in human males the zygosity of a trait on the X chromosome?
- A** Hemizygosity
B Heterozygosity
C Homozygosity
D Monozygosity
E Aplozygosity
- 703** Which one of the following is NOT correct about the vagus nerve?
- A** It is a cranial nerve
B It contributes to the innervation of the viscera
C It acts to increase hearth rate
D It has both a motor and a sensory component
E It acts to decrease blood preassure

- 704 In a large population with twice as many human males as females, what is the closest approximation to the ratio of the number of X chromosomes to the number of Y chromosomes?
- 2:1
 - 1:1
 - 1:2
 - 3:1
 - 1:3
- 705 What fraction of the offspring of the cross $AaBbCc \times AaBbCc$ will have the genotype $aabbcc$?
- $1/4$
 - $1/8$
 - $1/16$
 - $1/32$
 - $1/64$
- 706 A double stranded fragment of human DNA contains only the sequence for one gene. This is used in transcription to produce an mRNA transcript of that gene. The DNA fragment and mRNA only contain adenine, cytosine, guanine and thymine, which only pair according to the principles described by Watson and Crick. Which of the following statements are ALWAYS correct?
- The mRNA transcript must contain equal percentages of guanine and cytosine.
 - The mRNA transcript will have an identical sugar-phosphate backbone to the DNA that it was transcribed from.
 - 50% of the bases in the DNA fragment will be adenine and thymine.
 - In the DNA fragment there will be equal amounts of guanine and cytosine.
- 4 only
 - 1 and 4 only
 - 1 and 2 only
 - 2 and 3 only
 - 2, 3 and 4 only
- 707 The proximal convoluted tubule, the Henle loop and the distal convoluted tubule taken together form:
- the renal tubule
 - the renal glomerulus
 - the Bowman capsule
 - the renal vein
 - the nephron
- 708 All the living and non-living conditions that act on an organism and affect its chances of survival is called:
- ecology
 - living factor
 - environment
 - biome
 - ecosystem

- 709 What is the function of telomerase?**
- A** It joins Okazaki fragments on the lagging strand
 - B** It catalyzes DNA replication at the ends of chromosome
 - C** It enhances transcription
 - D** It inhibits transcription
 - E** It cuts the ends of chromosome
-
- 710 If the process of fertilization does not take place:**
- A** the fusion of gametes produces a new organism
 - B** the egg and the sperm bind through the corona radiata
 - C** menstruation occurs
 - D** estrogen and progesterone levels are at their highest
 - E** placental abruption occurs
-
- 711 In tomatoes, tall (T) is dominant to short (t), and smooth fruits (S) are dominant to hairy fruits (s). An agronomist crosses a plant ttss with a plant TtSs. What is the expected frequency of tall plants with hairy fruits?**
- A** 1/1
 - B** 1/2
 - C** 1/3
 - D** 1/4
 - E** 1/8
-
- 712 Sara would like to film the movement of chromosomes during cell division. Her best choice for a microscope would be:**
- A** a light microscope, because of its resolving power
 - B** a transmission electron microscope, because of its magnifying power
 - C** a scanning electron microscope, because the specimen is alive
 - D** a transmission electron microscope, because of its great resolving power
 - E** a light microscope, because the specimen is alive
-
- 713 What is added to the 3'-end of many eukaryotic mRNAs after transcription?**
- A** Introns
 - B** A poly-A tail
 - C** A cap structure, consisting of a modified G nucleotide
 - D** The trinucleotide 5'-CCA
 - E** Exons
-
- 714 In a dwarf rabbit strain, individuals homozygous for one allele are small; individuals heterozygous are dwarf; individuals homozygous for the other allele are deformed and die. If two dwarf rabbits are mated, what percentage of the surviving progeny should be small?**
- A** 1/2
 - B** 1/4
 - C** 2/3
 - D** 1/3
 - E** 3/4

- 715 The bacterial cell wall is composed of:**
- A** a phospholipid matrix
 - B** a lipoprotein
 - C** a polymer of sugars
 - D** chitin
 - E** a structural protein
-
- 716 The colon is primarily involved:**
- A** in the accumulation of solid masses undigested in the small intestine
 - B** in the absorption of liquids present in the materials coming from small intestine
 - C** in carbohydrates digestion
 - D** in proteins digestion
 - E** in fats digestion
-
- 717 Which of the following sentences is false?**
- A** An antibiotic is an agent that inhibits bacterial growth
 - B** Antibiotics include penicillins
 - C** Antibiotics are effective against viral infections
 - D** Both B and C
 - E** None of them
-
- 718 The necessary ingredients for DNA synthesis can be mixed together in a test tube. The DNA polymerase is from *Thermus aquaticus* (a bacteria) and the template is from a human cell. The DNA synthesized would be most similar to:**
- A** human DNA
 - B** *T. aquaticus* DNA
 - C** a mixture of *T. aquaticus* and human DNA
 - D** human RNA
 - E** *T. aquaticus* RNA
-
- 719 In the fruit fly *Drosophila melanogaster* a recessive allele (s) produces short wings when homozygous. A second recessive allele (p) determines pink eyes when homozygous as well. The locus of gene P is on a different chromosome than the locus of gene S. If a fly with genotype SSpp is crossed with a ssPp individual, what genotypes are expected in the offspring?**
- A** SsPp and Sspp in 1 : 1 proportion
 - B** SsPp and Sspp in 1 : 2 proportion
 - C** SSpp and sspp in 1 : 1 proportion
 - D** SSpp and sspp in 1 : 2 proportion
 - E** SSpp and ssPP in 1 : 1 proportion
-
- 720 In the small intestine, what is the mechanism that characterizes the absorption of amino acids?**
- A** Facilitated diffusion
 - B** Gradient diffusion
 - C** Osmosis
 - D** Active transport
 - E** Passive transport

721 The following shows the transfer RNA triplet with its associated amino acid:

tRNA triplet	amino acid	tRNA triplet	amino acid
GGC	◇	GAA	▽
AAG	○	AUC	■
CUA	□	CGG	⊙

Which DNA sequence listed can make a protein containing the sequence of amino acids

■-○-□-▽?

- A ATCAAGCTAGAA
- B UAGUUCGAUCUU
- C TAGTTCGATCTT
- D CGACCTAGCTCC
- E AAGATCCTTGTA

722 In mouse, black fur (B) is dominant to brown fur (b), and short tail (T) is dominant to long tail (t). The two genes are on different chromosomes. If a black and short-tailed mouse is crossed with a brown and long-tailed mouse, what fraction of the progeny will be black and short-tailed?

- A 100%
- B 50%
- C 75%
- D 25%
- E It depends on the first mouse genotype

723 The following organelles are involved in processing amino acids into glycoprotein:

1. Golgi apparatus
2. Ribosomes
3. RER

Which sequence is correct for this process?

- A 1 → 2 → 3
- B 1 → 3 → 2
- C 2 → 1 → 3
- D 2 → 3 → 1
- E 3 → 1 → 2

724 What is the basis for the difference in how the leading and lagging strands of DNA molecules are synthesized?

- A The origins of replication occur only at the 5' end
- B Helicases and single-strand binding proteins work at the 5' end
- C DNA polymerase can join new nucleotides only to the 3' end of a growing strand
- D DNA ligase works only in the 3' → 5' direction
- E Polymerase can work on only one strand at a time

- 725** A particular species of cactus has a range of spine density. Cacti with a low spine density are being eaten and damaged by a particular type of mammal. Cacti with a high spine density are being destroyed by the larvae of parasitic insects.
What type of selection is happening to this species of cactus?
- A** stabilising
 - B** artificial
 - C** directional
 - D** divergent
 - E** sexual
-
- 726** Which of the following statements is not true of viruses?
- A** Viruses have been successfully grown in pure cultures in test tubes
 - B** All viruses are obligatory intracellular parasites
 - C** All viruses have either DNA or RNA as their genetic material
 - D** Viruses probably arose from small fragments of cellular chromosomes
 - E** Genetic material of viruses codifies for proteins
-
- 727** The karyotype of a triploid plant contains 72 chromosomes. How many chromosomes would the karyotype of a diploid plant of the same species contain?
- A** 24
 - B** 48
 - C** 49
 - D** 71
 - E** 96
-
- 728** Which of the following sentences is true about the corpus luteum?
- A** It produces FSH
 - B** It produces LH
 - C** It produces ADH
 - D** It is a part of placenta
 - E** It is a temporary endocrine structure
-
- 729** In the endosymbiont hypothesis for the origin of eukaryotic cells, which of the following is proposed as the role of cyanobacteria?
- A** They become the chlorophyll of plant cells
 - B** They are the ancestor of mitochondria
 - C** They are the ancestor of the chloroplasts
 - D** They lose their DNA and become the vacuoles of plant cells
 - E** They lose their photosynthetic pigments and become the nuclei of eukaryotes
-
- 730** Receptors of steroid hormones are:
- A** cholesterol molecules
 - B** extracellular molecules
 - C** extracellular membrane phospholipids
 - D** nuclear membrane phospholipids
 - E** proteins

- 731** Sex in birds is determined by the chromosomes Z and W: males are ZZ and females are ZW. The gene locus determining birds colour is on chromosome Z, and has the two alleles: B (green colour, dominant) and b (purple colour, recessive). If a purple male is crossed with a green female, their offspring should be:
- A** all males green; all females purple
 - B** all males purple; all females green
 - C** all males green; half of females purple, the other half green
 - D** all females green; half of males purple, the other half green
 - E** males and females green
-
- 732** In which of the following blood vessels would squamous epithelial tissues be found?
- 1.aorta**
 - 2.vena cava**
 - 3.capillary**
- A** 1, 2 and 3
 - B** 1 and 3 only
 - C** 2 and 3 only
 - D** 3 only
 - E** 1 and 2 only
-
- 733** All of the following statements are correct but one. Select the wrong one.
- A** The haploid human genome is approximately one meter in length
 - B** All eukaryotic genomes consist of linear DNA molecules
 - C** The number of chromosomes an organism possesses invariably correlates with the complexity of that organism
 - D** Chromatin consists of DNA bound to proteins that assist with packaging DNA and gene expression
 - E** Histone proteins are highly conserved in all species and contain a large proportion of basic amino acids
-
- 734** Exons of a gene are defined as:
- A** the untranslated regions of the corresponding mRNA
 - B** regions in the corresponding mRNA that are involved in initiation of transcription
 - C** regions that are not transcribed by RNA polymerase
 - D** regions that are excised from the corresponding protein after it is synthesized
 - E** regions that remain in the corresponding mRNA after splicing
-
- 735** The m recessive allele in *Drosophila* determines miniature wings when in homozygotes. A *Drosophila* female with miniature wings is crossed with a male with long wings; the progeny is all made by males with miniature wings and females with long wings. What can be concluded?
- A** The m gene follows classical Mendel inheritance
 - B** The m locus is on the sex chromosome X
 - C** The m locus is on the sex chromosome Y
 - D** The m gene is codominant with the sex-determining gene
 - E** Male-specific factors influence wings length in fruit flies

- 736** An area of a neuron's axon is initially at its resting potential. An action potential then arrives. Which option correctly lists the order of some events observed (from earliest to latest), when the action potential arrives?
1. The potassium voltage-gated channels open.
 2. Sodium ions diffuse into the axon.
 3. The axon becomes hyperpolarised.
 4. The inside of the axon has a more positive charge than the outside.
 5. The sodium voltage-gated channels close.
- A** 2, 4, 5, 1, 3
B 2, 3, 1, 4, 5
C 5, 3, 4, 1, 2
D 1, 5, 2, 3, 4
E 5, 1, 3, 2, 4
-
- 737** A male hemophiliac and a normal female have a girl with the disease. Which of the following statements is/are true?
1. The mother is a symptom-free carrier
 2. The daughter inherited a dominant allele
 3. The genotype of the father is X^hY
 4. The genotype of the mother is $X^H X^h$
- A** 1 and 4 only
B 1, 3 and 4 only
C 2 and 3 only
D 3 and 4 only
E 2 only
-
- 738** Mitochondrial enzymes for oxidative metabolism are:
- A** on or within the surface of cristae
B located on the outer membrane
C only in the matrix
D floating freely in the intermembrane space
E in mitochondrial lysosomes
-
- 739** As opposed to an uncatalyzed reaction, in an enzymatically catalyzed reaction:
- A** the activation energy of the reaction is increased, thus favouring the likelihood that any substrate molecules will overcome it
B the activation energy of the reaction remains unchanged, but the substrate molecules are highly energized
C the activation energy of the reaction is increased, thus decreasing the likelihood that any substrate molecules will overcome it
D the activation energy of the reaction is lowered, but fewer substrate molecules can overcome it
E the activation energy of the reaction is lowered, and a larger proportion of substrate molecules has sufficient energy to overcome it

740 The members of a homologous pair of chromosomes:

- A** are identical in size and appearance
- B** contain identical genetic information
- C** separate to opposite poles of the cell during mitosis
- D** are found only in haploid cells
- E** are present only after the S phase

741 Which of the following can form part of the human non-specific immune response?

- 1. production of interferons**
- 2. raised temperature in the location of infection**
- 3. increased permeability of capillaries**

- A** 1, 2 and 3
- B** 1 and 2 only
- C** 2 and 3 only
- D** 1 and 3 only
- E** 1 only

742 A gene that determines hairy external ears is onto chromosome Y. Which of the following statements could be true about a male with hairy external ears?

- 1. He can have daughters with hairy external ears**
- 2. He can have grandsons with hairy external ears**
- 3. He cannot have granddaughters with hairy external ears**
- 4. His father have hairy external ears**

- A** 1 and 4 only
- B** 2, 3 and 4 only
- C** 2 and 3 only
- D** 1, 3 and 4 only
- E** 2 and 4 only

743 The activity of neurons of the respiratory centers is modulated by signals from chemoreceptors that:

- A** in case of increase of CO_2 in the blood send nerve impulses to decrease the respiratory rate
- B** in case of increase of CO_2 in the blood send nerve impulses to increase the respiratory rate
- C** in case of a decrease of CO_2 in the blood send nerve impulses to increase the respiratory rate
- D** in case of increase of O_2 in the blood send nerve impulses to increase the respiratory rate
- E** in case of blood pH increase send nerve impulses to increase the respiratory rate

744 Which of the following is/are true for a child with blood type O?

- 1. He can have a father with blood type AB**
- 2. He is homozygous**
- 3. He can have a mother with blood type O**
- 4. He cannot have a father with blood type B**

- A** 2 and 3 only
- B** 1, 2 and 3 only
- C** 2, 3 and 4 only
- D** 2 only
- E** 3 and 4 only

- 745** A natural unit of living and non-living parts that interact to produce a stable system in which the exchange of materials between living and non-living parts follows a circular path is called:
- A** a cycle
 - B** an ecosystem
 - C** an environment
 - D** a habitat
 - E** a community

- 746** A child with blood type A is born from a type B mother. Which of the following statements is most correct?
- A** The father must be type A
 - B** The mother passed along a dominant allele.
 - C** The father could be type A
 - D** The father could be type O
 - E** The mother was homozygous for the IA allele

- 747** Which row correctly identifies both a site of vasopressin (ADH) secretion and a site of action?

row	Site of ADH secretion	Site of ADH action
1	pituitary gland	nephron
2	adrenal gland	cardiac muscle
3	pancreas	liver
4	ovary	placenta
5	pituitary gland	bladder

- A** row 1
- B** row 2
- C** row 3
- D** row 4
- E** row 5

- 748** Which of the following cells can you find in the hypoderm?

- A** Keratinocytes and melanocytes
- B** Only keratinocytes
- C** Only melanocytes
- D** Merkel cells and macrophages
- E** Fibroblasts, adipose cells and macrophages

- 749** Epididymis occupies 5 cm in male reproductive system but is formed by a tightly-coiled tube that, if extended, measures around:

- A** 3 cm
- B** 10 m
- C** 100 cm
- D** 5 m
- E** 100 m

- 750 Which statement correctly describes the transcription of DNA?**
- A** It produces amino acids
 - B** It produces messenger RNA
 - C** It results in increased DNA synthesis
 - D** It is a semi-conservative process
 - E** It occurs at the surface of the ribosome
-
- 751 If there were 34 amino acids and DNA only contained two types of nitrogenous bases, what would the minimum number of bases coding an amino acid be?**
- A** 2
 - B** 3
 - C** 4
 - D** 5
 - E** 6
-
- 752 Mitosis and meiosis accomplish segregation of the replicated DNA to two or more daughter cells. Which of the following is characteristic of both mitosis and meiosis?**
- A** Chromosomes attach to spindle fibers composed of actin
 - B** The resulting cells are diploid (2n)
 - C** The resulting cells are haploid (n)
 - D** There are two resulting daughter cells
 - E** Chiasmata form between chromosome arms
-
- 753 A woman with blood type A Rh⁺ and a man with blood type AB Rh⁻ cannot have children with the:**
- A** AB Rh⁺ blood type
 - B** A Rh⁻ blood type
 - C** B Rh⁻ blood type
 - D** AB Rh⁻ blood type
 - E** O Rh⁻ blood type
-
- 754 Which of the following statements is/are true regarding food intolerance?**
- A** It is a food allergy
 - B** It is a non-allergic food hypersensitivity
 - C** It is a sense of disgust in eating certain foods
 - D** Both A and C
 - E** It is always due to the presence of IgE antibodies
-
- 755 Which of the following is/are the correct location(s) of the large ribosomes in typical eukaryotic cells, e.g. a human white blood cell?**
1. attached to the outside of the endoplasmic reticulum
 2. attached to the inside of the endoplasmic reticulum
 3. free in the cytoplasm
- A** 1 and 3 only
 - B** 1, 2 and 3
 - C** 1 and 2 only
 - D** 2 and 3 only
 - E** 1 only

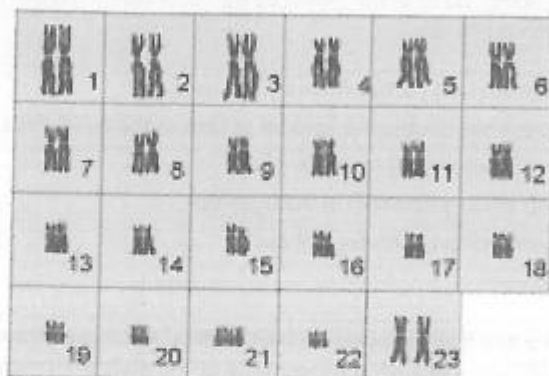
- 756 Which of the following is/are true for a gene maternally inherited?**
1. Its locus is on mitochondrial DNA
 2. It is inherited only by females
 3. Its locus is on the X chromosome
 4. It is passed by the mother to all offspring
- A** 1 and 4 only
B 2, 3 and 4 only
C 3 and 4 only
D 2 only
E 2 and 3 only
-
- 757 Bilirubin is a yellow pigment produced in the spleen and it is derived:**
- A** from the bile
B from the heme group of hemoglobin
C from the degradation of lymphocytes
D from the degradation of platelets
E from the degradation of macrophages
-
- 758 Which of these organelles produces H_2O_2 as a by-product?**
- A** Mitochondrion
B Nucleus
C Centrioles
D Flagellum
E Peroxisome
-
- 759 Members of which of the following terrestrial groups have the most water-permeable body covering?**
- A** *Insecta*
B *Reptilia*
C *Aves*
D *Arachnida*
E *Amphibia*
-
- 760 Which of the following crosses is most likely to produce offspring of genotype GgNn?**
- A** GGNN x ggnn
B GGnn x GgNn
C GgNn x GgNn
D ggNN x GGnn
E ggNn x GGNN
-
- 761 How many chromosomes does an individual with trisomy 18 (Edwards syndrome) have?**
- A** 46
B 23
C 22
D 45
E 47

- 762 The ADH is a hormone that:**
- A** causes a reduction in blood pressure
 - B** determines an increase in blood pressure
 - C** has no effect on blood pressure
 - D** determines the production of more dilute urine
 - E** promotes the elimination of liquids
-
- 763 In *Escherichia coli* the inability of the *lac* repressor to bind an inducer would result in:**
- A** no substantial synthesis of β -galactosidase
 - B** constitutive synthesis of β -galactosidase
 - C** inducible synthesis of β -galactosidase
 - D** synthesis of inactive β -galactosidase
 - E** synthesis of β -galactosidase only in the absence of lactose
-
- 764 Which one of the following is true regarding the neuromuscular junction?**
- A** It is always an excitatory synapse
 - B** The presynaptic cell is the muscular cell
 - C** It can use catecholamines as neurotransmitters
 - D** The presynaptic cell is an interneuron
 - E** When the receptors in the post-synaptic cell bind the neurotransmitter, they open and allow the influx of potassium ions and the efflux of sodium ions
-
- 765 In humans, how many molars form the permanent dentition?**
- A** 4
 - B** 6
 - C** 8
 - D** 10
 - E** 12
-
- 766 In a fold protein, the non polar (hydrophobic) amino acids tend to be:**
- A** exposed on the outside of the protein
 - B** hidden inside the protein
 - C** distributed randomly throughout the protein
 - D** cut away
 - E** substituted
-
- 767 Which of the following hormones is produced by the anterior pituitary?**
1. Growth hormone
 2. Thyroid-stimulating hormone
 3. Prolactin
 4. Adrenocorticotrophic hormone
- A** Only 1
 - B** Only 2
 - C** Only 1 and 2
 - D** Only 2 and 3
 - E** 1, 2, 3 and 4

768 The hepatic portal system carries oxygen-poor and nutrient-rich blood and consists of:

- A** vessels that connect the capillaries of the intestine to those of the liver
- B** vessels that connect the capillaries of the kidneys to those of the liver
- C** vessels that connect the capillaries of the lungs to those of the liver
- D** vessels that connect directly to the heart and liver
- E** vessels that connect the kidneys to the capillaries of the lungs

769 What genetic disorder is associated to the following karyotype?



- A** Turner syndrome
- B** Duchenne dystrophy
- C** Down syndrome
- D** Red-green colour blindness
- E** Dwarfism

770 Pernicious anemia is due to:

- A** iron deficiency
- B** reduction in the number of blood cells
- C** vitamin B12 deficiency
- D** premature degradation of red blood cells
- E** a mutation in the gene encoding beta chain of hemoglobin

771 A white blood cell engulfing a bacterium is an example of:

- A** pinocytosis
- B** receptor-mediated endocytosis
- C** exocytosis
- D** phagocytosis
- E** facilitated diffusion

772 Which statement correctly describes homologous chromosomes?

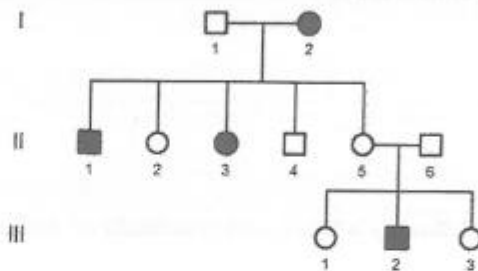
- A** They are formed during meiosis
- B** They are held together by centromeres
- C** They are identical
- D** They carry the same gene loci
- E** They are separated during mitosis

- 773 In the chemiosmotic mechanism:**
- A** ATP production is linked to the proton gradient established by the electron transport chain
 - B** the difference in pH between the intermembrane space and the cytosol drives the formation of ATP
 - C** the flow of H^+ through ATP synthases from the matrix to the intermembrane space drives the phosphorylation of ADP
 - D** the energy released by the reduction and subsequent oxidation of components of the electron transport chain is transferred as a phosphate to ADP
 - E** the production of water in the matrix by the reduction of oxygen leads to a net flow of water out of a mitochondrion
- 774 How does a nucleus in G_2 differ from a nucleus in G_1 ?**
- A** The G_2 nucleus has double the amount of DNA as the G_1 nucleus
 - B** DNA synthesis occurs only in the G_1 phase
 - C** Inactive cells are arrested only in the G_2 phase
 - D** During G_2 , the cell prepares for S phase
 - E** All of the above
- 775 White eyes is a sex-linked recessive trait in flies. A heterozygous female is crossed with a male with wild-type eyes; what percentage of the male offspring will have white eyes?**
- A** 0%
 - B** 25%
 - C** 50%
 - D** 75%
 - E** 100%
- 776 When two loci are in near proximity on the chromosome, the phenotypic classes of the progeny do not fit with the expected Mendelian frequencies. This is due to:**
- A** linkage
 - B** aploidy
 - C** translocation
 - D** independent assortment
 - E** natural random fluctuations
- 777 Islets of Langerhans produce:**
- A** only insulin
 - B** only glucagon
 - C** both insulin and glucagon
 - D** both insulin and glucose
 - E** only glucocorticoids
- 778 The lymph nodes are the peripheral organs of the lymphatic system and are intended to:**
- A** produce lymphocytes
 - B** filter lymph and destroy red blood cells
 - C** filter lymph and destroy platelets
 - D** filter lymph and enrich it of lymphocytes
 - E** filter the blood

779 Chickenpox is an infective disease caused by:

- A a herpesvirus
- B a pneumococcus
- C a prion
- D a chicken virus
- E none of the above

780 The pedigree below shows the transmission of a disease in a particular family. Based on this pattern of heredity, the disease is most likely:



- A sex-linked dominant
- B sex-linked recessive
- C autosomal dominant
- D autosomal recessive
- E a larger pedigree is needed to answer to this question

781 The term ketosis refers to:

- A high concentration of ketone bodies only in blood
- B high concentration of ketone bodies in cells
- C high concentration of ketone bodies only in urine
- D high concentration of ketone bodies in blood and urine
- E high concentration of ketone bodies in cells and urine

782 Which pair is correct?

- A G1 phase - DNA replication
- B G2 phase - preparation for mitosis
- C S phase - cell division
- D M phase - cell growth
- E G2 phase - preparation for DNA replication

783 If the genetic code consisted of four bases per codon rather than three, the maximum number of unique amino acids that could be encoded would be:

- A 16
- B 64
- C 128
- D 256
- E 512

- 784** A recessive allele causes the disease phenylketonuria. Two healthy parents have a son with the disease; what is the probability they will have another diseased child?
- A** 0%
 - B** 25%
 - C** 50%
 - D** 75%
 - E** 100%
-
- 785** In the eye, the structure that acts as a diaphragm and regulates the intensity of the light that reaches the retina is called;
- A** lens
 - B** cornea
 - C** iris
 - D** pupil
 - E** sclera
-
- 786** Which one of the following is NOT found in naturally occurring eukaryotic DNA?
- A** genes
 - B** lipid
 - C** carbohydrate
 - D** alleles
 - E** phosphodiester bonds
-
- 787** The cardiac contraction:
- A** is voluntary
 - B** is arrhythmic
 - C** is involuntary
 - D** originates from Purkinje fibres
 - E** originates from the nervous system
-
- 788** By crossing two plants, the resulting offspring is made by 156 individuals with the dominant phenotype A, and 47 individuals with the recessive phenotype a. What is the most probable genotype of the two parents?
- A** AA and Aa
 - B** aa and aa
 - C** AA and aa
 - D** Aa and Aa
 - E** aa and Aa
-
- 789** Brown spotted teeth in humans are caused by a dominant sex-linked allele. A woman heterozygous for this trait marries a man with normal teeth. Therefore:
- A** all of their daughters will have spotted teeth
 - B** none of their daughters will have spotted teeth
 - C** all of their sons will have spotted teeth
 - D** none of their sons will have spotted teeth
 - E** half of their children will have spotted teeth

790 Microtubules that form the mitotic spindle tend to originate from and terminate in:

- A** centromeres and telomeres
- B** euchromatin
- C** centrioles and telomeres
- D** the nuclear envelope
- E** centrioles and kinetochores

791 The DNA code for glutamic acid is CTC or CTT. The code for valine is CAA or CAT. In sickle cell hemoglobin, valine is present instead of glutamic acid. Assuming a single base pair substitution has occurred to change the code from glutamic acid to valine, what is the mRNA code in the affected mutant?

- A** CUU
- B** GAA
- C** GAG
- D** GUA
- E** GUU

792 What fraction of the offspring of two parents with the genotype AABbCcdd will have genotype AAbbCcdd?

- A** 1/4
- B** 1/6
- C** 1/8
- D** 2/5
- E** 1/5

793 Diabetes:

- A** is always characterized by a deficit in insulin synthesis
- B** is always characterized by a deficit in insulin-receptor synthesis
- C** is always characterized by a decrease in glucose blood levels
- D** is always characterized by a decrease in glycogen blood levels
- E** none of the above

794 The walls of the digestive system are formed by three different cellular layers. What are the name and the composition of the outer one (away from the lumen)?

- A** Mucosa and it is formed by epithelial, connective and muscular tissue
- B** Mucosa and it is formed by two layers of smooth muscle with different orientation
- C** Submucosa and it is formed by connective tissue
- D** Muscle layer and it is formed by two layers of smooth muscle with different orientation
- E** Muscle layer and it is formed by epithelial, connective and muscular tissue

795 What is the likelihood that a couple with 2 daughters will have a third daughter?

- A** 3.125%
- B** 6.25%
- C** 12.5%
- D** 25%
- E** 50%

796 Which of the following anatomical regions is NOT involved in the immune response?

- A** Bone marrow
- B** Liver
- C** Spleen
- D** Appendix
- E** Thymus

797 Which of the following statements is/are true for alleles?

- 1.** In each somatic cell there are two alleles per gene
- 2.** There can be multiple alleles for a gene
- 3.** Each allele can be found only in its corresponding gene locus
- 4.** They are alternative forms of a gene

- A** None
- B** All
- C** 1, 3 and 4 only
- D** 2, 3 and 4 only
- E** 1 and 4 only

798 Which of the following represents the sequence of electron flow in the light reactions of photosynthesis in higher plants?

- A** $H_2O \rightarrow \text{photosystem I} \rightarrow \text{photosystem II} \rightarrow \text{NADP}$
- B** $H_2O \rightarrow \text{photosystem II} \rightarrow \text{photosystem I} \rightarrow \text{NADP}$
- C** $H_2O \rightarrow \text{photosystem II} \rightarrow \text{photosystem I} \rightarrow \text{ATP}$
- D** $\text{NADPH} \rightarrow \text{photosystem I} \rightarrow \text{photosystem II} \rightarrow O_2$
- E** $\text{Photosystem I} \rightarrow \text{photosystem II} \rightarrow \text{NADPH} \rightarrow O_2$

799 Which of the following diseases are due to sex-linked genes?

- 1.** Down syndrome
- 2.** Hemophilia
- 3.** Pneumonia
- 4.** Red-green colour blindness
- 5.** Cystic fibrosis

- A** None
- B** All
- C** 2 and 4 only
- D** 2, 4 and 5 only
- E** 3, 4 and 5 only

800 An example of commensalism where one organism benefits from the relationship but the other is neither helped nor harmed is:

- A** a leech living on a frog
- B** influenza virus in the lungs
- C** *E. coli* bacteria in the gut
- D** a tick living on a dog
- E** hepatitis virus in the liver

801 Which of the following parents-son pairs are impossible according to blood type inheritance?

- A** Mother AB and father O-son A
- B** Mother O and father A-son O
- C** Mother A and father B-son O
- D** Mother AB and father O-son O
- E** Mother AB and father AB-son B

802 Which of the following statements is not true of glycolysis?

- A** ADP is phosphorylated to ATP via substrate-level phosphorylation
- B** The pathway does not require oxygen
- C** The pathway oxidizes two moles of NADH to NAD^+ for each mole of glucose that enters
- D** The pathway requires four moles of ATP to get started catabolizing each mole of glucose
- E** The pathway occurs in the cytoplasm

803 Which of the following transport mechanisms require the use of protein molecules found in membranes and ATP?

1. Active transport

2. Diffusion

3. Facilitated diffusion

- A** 1 only
- B** 3 only
- C** 2 and 3 only
- D** 1 and 2 only
- E** 1 and 3 only

804 The light reactions of photosynthesis use _____ and produce _____.

- A** NADPH; NADP^+
- B** water; NADPH
- C** carbon dioxide; oxygen
- D** carbon dioxide; sugar
- E** NADPH; oxygen

805 A female cannot have inherited any sex chromosome from:

- A** maternal grandfather
- B** father
- C** paternal grandmother
- D** paternal grandfather
- E** maternal grandmother

806 A genetic cross between two plants with yellow flowers produces a progeny of 80 plants, 38 of which have yellow flowers, 22 have red flowers and 20 have white flowers. What kind of relationship between the alleles is present?

- A** Co-dominance
- B** Complete dominance
- C** Multiple alleles
- D** Incomplete dominance
- E** Epistasis

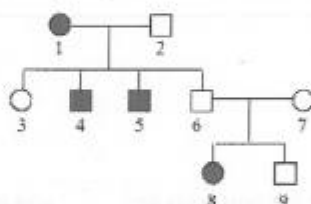
- 807 In a maternity room four babies have been exchanged in their cradles by mistake; blood groups of infants and those of the couples of parents are reported in the following table:

Blood groups	
Infant	Parents
1. O	a. AB x O
2. A	b. A x O
3. B	c. A x AB
4. AB	d. O x O

Indicate the right infant-parents pairings:

- A 1-a; 2-b; 3-d; 4-c
- B 1-b; 2-c; 3-a; 4-d
- C 1-d; 2-b; 3-a; 4-c
- D 1-c; 2-d; 3-a; 4-b
- E 1-a; 2-b; 3-c; 4-d

- 808 Given the following family tree (or pedigree chart):



we can certainly say that:

- A male 2 is homozygous
- B the affected character is autosomal dominant
- C female 8 is heterozygous
- D female 7 is heterozygous
- E male 6 is homozygous

- 809 An example of exocrine gland is:

- A pituitary gland
- B liver
- C thyroid
- D epiphysis
- E exocrine glands do not exist

- 810 Which of the following must occur for a prokaryote cell to divide?

- A A reproductive signal, replication, segregation of DNA, and cytokinesis
- B DNA replication, crossing over, and segregation of DNA
- C DNA replication and segregation of DNA
- D Cell growth and cytokinesis
- E DNA replication, segregation of DNA, and cytokinesis

811 Mutations can occur in which of the following:

- 1. introns
- 2. exons
- 3. mitochondrial DNA

- A 2 and 3 only
- B 1 only
- C 1, 2 and 3
- D 1 and 2 only
- E 1 and 3 only

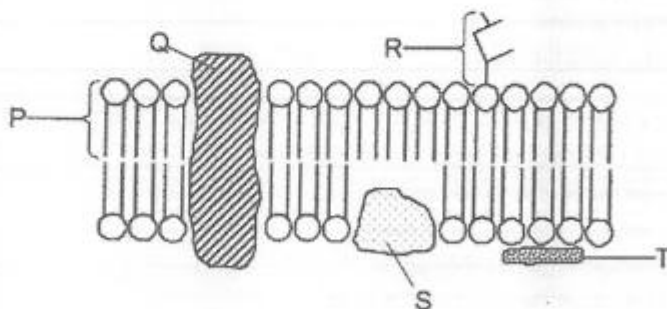
812 The polarity in a DNA strand is indicated by referring to one end as the 3' and the other as the 5' end. Which structure is on the 3' end?

- A Hydroxyl group
- B Aldehydes
- C Phosphate
- D Nitrogenous base
- E Ketone group

813 "Gene library" is a term used to describe:

- A a computerized listing of known DNA sequences
- B bacteria with plasmids containing DNA fragments representing the majority of the genetic information from a plant or animal cell
- C a collection of books about recombinant DNA technology
- D a compilation of the amino acid sequences of protein coding genes
- E a store specialized in the sale of genetic books

814 The diagram below represents the fluid mosaic model of the cell (surface) membrane.



Only two of the labelled molecules have both hydrophobic and hydrophilic areas. Which two molecules are they?

- A P and T
- B R and S
- C P and Q
- D S and T
- E Q and R

- 815** A boy is treated with Ciprofloxacin, an antibiotic that interferes with the enzymes that cause DNA to rewind after being copied. Which of the following enzyme activity is most directly affected by this drug?
- A** DNA polymerase
 - B** Topo-Isomerase
 - C** Reverse transcriptase
 - D** RNA polymerase
 - E** Elicase
- 816** Which one of the following molecules will contain the greatest number of different elements?
- A** Water
 - B** Lipids
 - C** Polysaccharide carbohydrates
 - D** Monosaccharide carbohydrates
 - E** Amino acids
- 817** **Alternative splicing:**
- A** creates protein from multiple segments of DNA on different chromosomes
 - B** is the reason why the human genome is much more complex than that of other species
 - C** creates different proteins from a single gene
 - D** is not tissue specific
 - E** eliminates the exons
- 818** An organelle differs from an organ in that an organelle:
- A** is a substructure of a cell
 - B** contains one specific type of tissue
 - C** is larger than an organ
 - D** cannot be stained
 - E** has no specific function
- 819** Which one of the following is NOT correct about human chromosomes?
- A** They can attach to the spindle at the centriole
 - B** They are made of DNA and protein
 - C** They are sometimes found in pairs
 - D** They contain regions called genes
 - E** They are sometimes not found in pairs
- 820** Sarcomeres are the basic unit of muscles. Sarcomeres are composed of proteins that slide when the muscles contract and relax. Which of the following sentences is true?
- A** Muscle cell from a biceps may contain 100 sarcomeres
 - B** Myosin forms the thick filament while actin forms the thin filament
 - C** The myofibrils of smooth muscle cells are arranged into sarcomeres
 - D** A sarcomere is defined as the segment between two neighboring H-lines
 - E** Myosin forms the thin filament while actin forms the thick filament

821 The irreversible dilation of an artery is called:

- A** aneurysm
- B** embolism
- C** stroke
- D** ischemia
- E** thrombosis

822 Which row/rows of the table correctly identifies/identify what happens during an action potential?

	Ion Channel	Resting membrane potential	Depolarization	Ripolarization	Hyper-polarization
1	Na ⁺	Closed	Open	Closed	Closed
2	Na ⁺	Open	Closed	Open	Open
3	K ⁺	Closed	Closed	Closed	Open
4	K ⁺	Closed	Closed	Open	Open

- A** 1
- B** 1 and 3
- C** 1 and 4
- D** 3
- E** 2

823 It is difficult to deliver drugs to the brain because:

- A** human brain has a limited number of capillaries
- B** the drugs are large molecules that cannot pass through neurons membrane
- C** tight junctions between endothelial cells of brain capillaries block the passage of most molecules
- D** the cerebrospinal fluid contains enzymes that degrade most of drugs
- E** most drugs are lipophilic compounds and cannot pass through the myelin sheath

824 Which of the following regions control ventilation?

1. Medulla oblongata
2. Cerebral cortex
3. Cerebellum

- A** 1 only
- B** 2 only
- C** 1 and 2 only
- D** 1, 2 and 3
- E** 3 only

825 Which of the following statements regarding vasopressin is true?

- A** It is secreted by the kidney
- B** Its release induces a decrease in water absorption in the collecting ducts
- C** It contains aminoacids
- D** It does regulate salt but not glucose concentration in the blood
- E** It is another name for oxytocin

- 826** The locus for a sex-linked gene is on the X chromosome; the gene has a recessive allele causing a disease. By pedigree analysis of this gene's heredity, we should expect that:
- A** every affected person has an affected parent
 - B** unaffected mothers can give birth to affected sons
 - C** affected fathers always have affected sons
 - D** affected mothers always have affected daughters
 - E** unaffected fathers always have affected daughters from an affected mother
 - F**
-
- 827** Hormones involved in regulation of calcium blood levels are:
- A** oxytocin and ACTH
 - B** calcitonin and oxytocin
 - C** melatonin and parathyroid hormone
 - D** oxytocin and parathyroid hormone
 - E** calcitonin and parathyroid hormone
-
- 828** A molecule made up of 10 glucose units (monomers) joined together by a 1-4 glycosidic bonds to form a straight-chain would have the formula:
- A** $C_{60}H_{102}O_{51}$
 - B** $C_{60}H_{120}O_{60}$
 - C** $(C_{12}H_{22}O_{11})_{10}$
 - D** $C_{60}H_{100}O_{50}$
 - E** $C_{60}H_{118}O_{58}$
-
- 829** The diaphragm separates the chest from the abdominal cavity; what does it do during the inspiratory phase?
- A** It determines the relaxation of the intercostal muscles
 - B** It determines the expulsion of air from the lungs
 - C** It relaxes
 - D** It lowers
 - E** It is not involved in the inspiration phase
-
- 830** Which of the following is false regarding histamine?
- A** It induces vessel constriction to reduce the amount of circulating pathogens
 - B** It is released by mast cells and basophils
 - C** It is involved in the inflammatory response
 - D** An excessive release of histamine can cause anaphylactic shock
 - E** It derives from the amino acid histidine
-
- 831** During catabolism, only about 40% of the energy available from oxidizing glucose is used to synthesis ATP. What happens to the other 60%?
- A** It is lost as heat
 - B** It is used to reduce NADP
 - C** It remains in the products of metabolism
 - D** It is stored as fat
 - E** It is used for passive transport

832 Which one of the following would be different in a pair of non-identical twins?

- A** The total of adenine plus guanine
- B** The amount of nuclear DNA
- C** The alleles
- D** The genes
- E** The chromosome number

833 Class II Major histocompatibility complex are expressed:

- A** by antigen presenting cells
- B** after antigen stimulation
- C** by natural killer cells
- D** by T helper lymphocytes
- E** by all cell types

834 Saprophytic fungi obtain their nutrition by:

- A** taking food into their gastrovascular cavity, digesting and absorbing it
- B** making food by chemosynthesis
- C** secreting digestive enzymes into the environment and then absorbing the digestive products
- D** using their amoeboid cells in phagocytosis
- E** forming a parasitic relationship with soil bacteria

835 What is the acrosome?

- A** It is an organelle contained in egg cells
- B** It is a glycoprotein membrane surrounding the plasma membrane of an oocyte
- C** It is an organelle that develops over the anterior half of the head in the spermatozoa
- D** It is the initial cell formed when two gamete cells are joined by means of sexual reproduction
- E** It is a "nurse" cell of the testes that is part of a seminiferous tubule

836 The affinity of oxygen for hemoglobin is:

- A** high when O_2 concentration is high
- B** low when O_2 concentration is high
- C** high when pH decreases
- D** high when CO concentration is high
- E** high when CN^- concentration is high

837 The pathway of blood in the large circulation begins from:

- A** the right atrium
- B** the left atrium
- C** the right ventricle
- D** the left ventricle
- E** the lungs

838 What's the role played by the parietal cells in the gastric glands?

- A** They secrete pepsinogen for proteins degradation
- B** They secrete HCl
- C** They produce mucus
- D** They produce gastrin
- E** The parietal cells are in the pyloric glands

839 What is the first step of systole phase?

- A** The contraction of the atria
- B** The contraction of the ventricles
- C** A drop in the atria pressure
- D** A drop in the ventricles pressure
- E** A drop in the atria and ventricles pressure

840 Which is the predominant cell type in epidermis?

- A** Cells of the immune system
- B** Fibroblasts
- C** Keratinocytes
- D** Both A and C
- E** Melanocytes

841 The drugs used to relieve pain are called:

- A** analgesics
- B** anaesthetics
- C** sedatives
- D** anxiolytics
- E** antispasmodics

842 1 meter = ____ nanometers

- A** 1,000
- B** 1,000,000,000,000
- C** 1,000,000
- D** 1,000,000,000
- E** 100

843 Which of the following would not be found in the mitochondrial matrix?

- A** Ribosomes
- B** DNA
- C** Enzymes
- D** Proteins
- E** All of the above can be found in the mitochondrial matrix

844 Which of the following statements about sister chromatids is false?

- A** They arise by replication during S phase
- B** They separate from each other during each mitotic anaphase
- C** They usually contain identical versions of the same genetic information
- D** They separate from each other during meiosis I
- E** They are joined during prophase I and metaphase I at their common centromere

845 A 9 : 3 : 3 : 1 ratio of phenotypes should be observed in:

- A** the offspring from a RrTtSs x RrTtSs cross
- B** the offspring from a RrTt x RrTT cross
- C** the offspring from a RRTTSs x RrTtSs cross
- D** the offspring from a RrTt x RrTt cross
- E** the offspring from a RRTT x rrtt cross

- 846 In a population of bears, which would be considered the fittest?**
- A** The biggest bear
 - B** The bear having the largest number of mutations
 - C** The bear that best blends in with its environment
 - D** The strongest and fiercest bear
 - E** The bear that leaves more descendants
- 847 Which of the following is a major difference between mitosis and meiosis?**
- A** Interphase is present only in mitosis
 - B** Homologous chromosomes associate only in meiosis
 - C** DNA replication occurs only in mitosis
 - D** Daughter chromatids separate only in meiosis
 - E** Chromosomes line up on the cell equator only in meiosis
- 848 All the organisms in a particular area at a given time is called:**
- A** population
 - B** species
 - C** habitat
 - D** community
 - E** phytocenosis
- 849 Which of these is not a product of glycolysis?**
- A** Water
 - B** $\text{NADH} + \text{H}^+$
 - C** ATP
 - D** FADH_2
 - E** Pyruvate
- 850 In a set of genetic crosses the offspring produced showed the same phenotype ratio of 9 : 3 : 3 : 1. Which of the following statements could be true?**
- 1.** Two genes each with two alleles were studied
 - 2.** All parents were heterozygous
 - 3.** Some offspring had a phenotype different to the parents
 - 4.** Some offspring had the same phenotype as that of the parents
- A** 1, 2, 3 and 4
 - B** 3 and 4 only
 - C** 1 and 2 only
 - D** 1 only
 - E** 2 and 3 only

Soluzioni

Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta
601	B	602	A	603	A	604	B	605	A	606	A	607	A	608	B	609	A
611	A	612	C	613	B	614	E	615	E	616	D	617	B	618	C	619	D
621	A	622	A	623	B	624	A	625	B	626	D	627	C	628	E	629	E
631	A	632	D	633	D	634	E	635	A	636	C	637	C	638	A	639	E
641	B	642	A	643	B	644	D	645	B	646	B	647	E	648	E	649	B
651	B	652	A	653	E	654	E	655	B	656	C	657	D	658	D	659	C
661	A	662	E	663	A	664	B	665	C	666	A	667	A	668	A	669	C
671	C	672	D	673	D	674	A	675	A	676	C	677	B	678	B	679	B
681	B	682	E	683	D	684	B	685	A	686	C	687	F	688	B	689	C
691	C	692	D	693	B	694	B	695	C	696	E	697	E	698	B	699	A
701	D	702	A	703	C	704	A	705	E	706	A	707	A	708	C	709	B
711	D	712	E	713	B	714	D	715	C	716	B	717	C	718	A	719	A
721	A	722	E	723	D	724	C	725	A	726	A	727	B	728	E	729	C
731	A	732	A	733	C	734	E	735	B	736	A	737	B	738	A	739	E
741	A	742	B	743	B	744	A	745	B	746	C	747	A	748	E	749	D
751	E	752	A	753	E	754	B	755	A	756	A	757	B	758	E	759	E
761	E	762	B	763	A	764	A	765	E	766	B	767	E	768	A	769	C
771	D	772	D	773	A	774	A	775	C	776	A	777	C	778	D	779	A
781	D	782	B	783	D	784	B	785	C	786	B	787	C	788	D	789	E
791	D	792	C	793	E	794	D	795	E	796	B	797	B	798	B	799	C
801	D	802	D	803	A	804	B	805	D	806	D	807	C	808	D	809	B
811	C	812	A	813	B	814	C	815	B	816	E	817	C	818	A	819	A
821	A	822	C	823	C	824	A	825	C	826	B	827	E	828	A	829	D
831	A	832	C	833	A	834	C	835	C	836	A	837	D	838	B	839	A
841	A	842	D	843	E	844	D	845	D	846	E	847	B	848	D	849	D

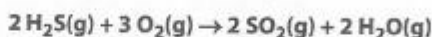
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parte quarta

CHIMICA

Quesiti

851 For the reaction:



when 600 cm^3 of hydrogen sulfide completely reacts with precisely the required volume of oxygen, what is the combined volume of the two products?

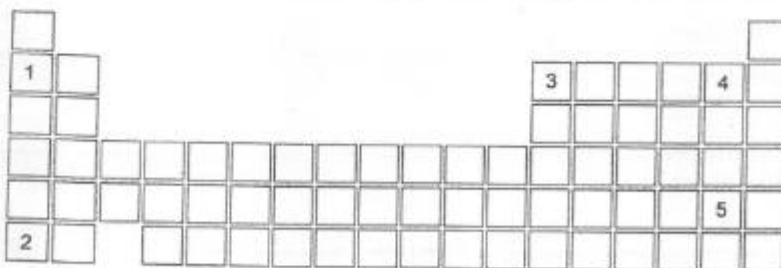
[Assume all gases are ideal and have the same temperature and pressure.]

- A 1200 cm^3
- B 600 cm^3
- C 800 cm^3
- D 1600 cm^3
- E 1800 cm^3

852 How many grams of potassium carbonate (K_2CO_3) you need to have two moles of this compound? Atomic weight of potassium is 39 a.m.u., atomic weight of carbon is 12, atomic weight of oxygen is 16.

- A 138 g
- B 13.8 g
- C 276 mg
- D 134 g
- E 276 g

853 The diagram shows the position of five elements (1-5) on the periodic table. Which one of the five elements has the most exothermic first electron affinity?



- A 4
- B 1
- C 2
- D 3
- E 5

854 Which of the following statements about amines is NOT true?

- A** They are of three types: primary, secondary and ternary
- B** They generally have a bad smell
- C** They are always soluble in water
- D** They are nucleophilic
- E** They are Lewis base

855 Which of the following could be the correct electronic configuration of an atom at its elementary state?

- A** $1s^2 2s^1 2p^6$
- B** $1s^2 2s^2 2p^4$
- C** $1s^2 2s^4 2p^6$
- D** $1s^2 2s^2 2p^8$
- E** $1s^2 2s^2 3p^6$

856 Which of the following statements is NOT true about amino acids?

- A** They are zwitterions
- B** They are formed only by C, H, O, N
- C** Not all the amino acids contain a chiral carbon
- D** They can contain aromatic residual
- E** The form protein through a condensation reaction between the amino and the carboxylic group

857 Which is the geometry of the BF_3 molecule ?

- A** Tetrahedral
- B** Linear
- C** Spherical
- D** Triangular
- E** Octahedral

858 The formula of magnesium perchlorate is:

- A** $Mn(ClO_4)_3$
- B** $MgClO$
- C** $Mg_2(ClO_3)_2$
- D** $Mg(ClO_4)_2$
- E** $Mg(ClO_3)_3$

859 Calculate pOH of a solution obtained mixing 2 l of distilled water and 72 g of cloridric acid (HCl molecular weight = 36 g/mol).

- A** 7
- B** 2
- C** 12
- D** 13
- E** 14

860 Which is the pH of a solution of NaOH 10^{-12} M?

- A 7
- B 12
- C 14
- D 5
- E Lightly acid

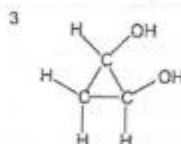
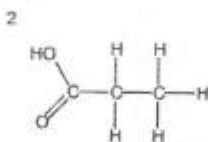
861 Is it more acid a solution of sulphuric acid, nitric acid or acetic acid?

- A Sulphuric acid
- B Nitric acid
- C Acetic acid
- D It depends on the molarity of the three solutions
- E Nitric acid and sulphuric acid have the same acidity

862 Which one of the following salts give a neutral solution in water?

- A CH_3COONa
- B NH_4Cl
- C $\text{Ba}(\text{NO}_3)_2$
- D LiNO_2
- E NaClO

863 Which of the structures shown is a structural isomer of propane-1,2-diol?



- A 1 only
- B 2 only
- C 1 and 3 only
- D 2 and 3 only
- E 1, 2 and 3

864 How many litres of NaOH 0.2 M you should add to neutralize 500 ml of HCl 2 N?

- A 500 ml
- B 5 ml
- C 200 ml
- D 1 l
- E 5 l

865 A salt obtained by reacting a strong acid and a weak base, in distilled water generates:

- A** a lightly basic solution
- B** a lightly acid solution
- C** the salt is not soluble in water
- D** a solution neutral
- E** a solution strongly basic

866 Which is the property that defines a Lewis' base?

- A** The possibility to release in water OH^- ion
- B** The possibility to accept H^+ ion
- C** The possibility to give a nonbonding electrons pair
- D** The possibility to receive a bonding electrons pair
- E** The reactivity towards strong acid

867 Which of the following compounds is NOT an alkene?

- A** C_2H_4
- B** C_3H_6
- C** C_6H_{14}
- D** $\text{C}_{18}\text{H}_{36}$
- E** $\text{C}_{10}\text{H}_{20}$

868 Which element among these has the possibility to produce polymer like carbon?

- A** Oxygen
- B** Fluorine
- C** Calcium
- D** Sodium
- E** Silicon

869 When an alkane becomes an alkene?

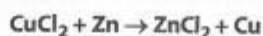
- A** When it loses one carbon atom
- B** When it loses one hydrogen atom
- C** When it accepts one hydrogen by another molecule
- D** When the oxidation state of two carbons raises from -4 to -3
- E** When it accepts an oxygen atom by another molecule

870 "Intramolecular bonds always define the geometry of molecules, their polarity and their reactivity, but observing only the geometry of a molecule you cannot predict its state of aggregation; this property depends on intermolecular bond. In many liquids, like water, the boiling point is determined by the kind, the quantity and the strength of the intermolecular bonds."

Reading this text which statement you CANNOT assert that is true?

- A** Intramolecular bonds define the geometry of a molecule
- B** Intermolecular bonds are always weaker than intramolecular bonds
- C** Boiling point can depend on Intermolecular bonds
- D** The polarity of a molecule is defined by the intramolecular bonds
- E** In water intermolecular bonds are present

871 For the equation:



which is the correct statement about the reaction it represents?

- A Two electrons are transferred from zinc to copper.
- B CuCl_2 is the reducing agent.
- C Zn is the oxidising agent.
- D Zn is reduced.
- E Two electrons are transferred from copper to zinc.

872 The ferric nitrate is a salt formed by:

- A two cations Fe^{2+} and one anion NO_3^-
- B three anions Fe^{3-} and one cation NO_3^+
- C three cations Fe^+ and one anion NO_3^-
- D one cation Fe^{3+} and three anions NO_3^-
- E one cation Fe^{2+} and two anions NO_3^-

873 The secondary quantum number of an electron occupying the 3s orbital is:

- A 3
- B 1
- C -1
- D 0
- E -2

874 Which is the last occupied orbital of an atom with 12 electrons?

- A Is not possible to define the last occupied orbital by only knowing the number of electrons
- B 3s
- C 3p
- D 3d
- E 2p

875 Which is the chemical name of the compound ZnSO_3 ?

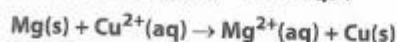
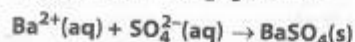
- A Zinc sulphate
- B Zinc sulphide
- C Zinc persulphate
- D Zirconium sulphate
- E Zinc sulphite

876 A molecule containing two alkaline cations and one anion of the sixth group:

- A could have a general formula A_2X
- B is a base
- C has at least a covalent bond
- D is a bivalent molecular anion
- E is not possible to obtain any product by the combination of these two atoms

- 877** How many electrons nitrogen shares with oxygen in NO_2 ?
- A** Two
B Three
C Five
D Four
E One
-
- 878** Which one of the following statements is NOT correct about the first row transition metals Fe, Cu and Zn?
- A** Only two of them form coloured ions
B They all form basic oxides
C They all have densities greater than those of Group 1 metals
D They are all reactive metals
E All of them form M^{2+} ions
-
- 879** Which of these salts is NOT correct for beryllium?
- A** BeSO_4
B $\text{Be}(\text{HCO}_3)_2$
C BeS_2
D $\text{Be}(\text{ClO}_4)_2$
E BeSO_3
-
- 880** Which one of the following is NOT the correct formula for a lithium compound?
- A** LiHSO_4
B LiCO_3
C $\text{CH}_3\text{CO}_2\text{Li}$
D Li_3N
E Li_2S
-
- 881** Which of the following salts generates an acid solution?
- A** $\text{NaCl} \rightarrow \text{Na}^+ + \text{Cl}^-$
B $\text{Ca}(\text{ClO}_4)_2 \rightarrow \text{Ca}^{2+} + 2 \text{ClO}_4^-$
C $\text{NH}_4\text{NO}_3 \rightarrow \text{NH}_4^+ + \text{NO}_3^-$
D $\text{SrF}_2 \rightarrow \text{Sr}^{2+} + 2 \text{F}^-$
E $\text{LiOH} \rightarrow \text{Li}^+ + \text{OH}^-$
-
- 882** Choose the correct equation:
- A** $\text{CH}_4 + 2 \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
B $\text{MnO}_4^- + 5 \text{Fe}^{3+} + 6 \text{H}^+ \rightarrow \text{MnO} + 5 \text{Fe}^{2+} + 3 \text{H}_2\text{O}$
C $3 \text{CH}_3\text{COONH}_4 + \text{FeBr}_3 \rightarrow 3 \text{NH}_4\text{Br} + (\text{CH}_3\text{COO})_3\text{Fe}$
D $\text{H}_2\text{S} \rightarrow \text{H}^+ + \text{HS}$
E $\text{HNO}_3 + 2 \text{KOH} \rightarrow \text{K}_2\text{NO}_3 + \text{H}_2\text{O}$

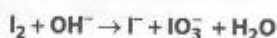
883 Consider the following reactions:



Which type of reaction is NOT included in this list?

- A Substitution
- B Displacement
- C Precipitation
- D Oxidation/reduction
- E Elimination

884 Which is the correct stoichiometry of the following redox reaction?



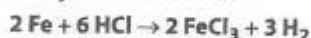
- A 1; 3; 1; 1; 3
- B 3; 3; 1; 2; 3
- C 3; 6; 5; 2; 3
- D 3; 9; 5; 1; 5
- E 3; 6; 5; 1; 3

885 Which is the correct stoichiometry of the following redox reaction?



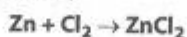
- A 3; 8; 2; 3; 2; 4
- B 2; 4; 2; 3; 2; 3
- C 6; 16; 4; 6; 4; 4
- D 3; 4; 2; 2; 4; 3
- E 6; 8; 2; 6; 2; 2

886 How many moles of hydrogen are generated by the following reaction, knowing that there are 4 moles of iron and 9 moles of hydrochloric acid?



- A 2
- B 3
- C 6
- D 1
- E 4.5

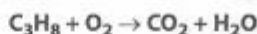
887 35 g of molecular chlorine is reduced to 13.5 g of zinc chloride using metallic zinc in excess. (Zn = 65 a.m.u. and Cl 34.5 = a.m.u.)



What is the yield of the reaction?

- A 2.6%
- B 10%
- C 20%
- D 13.5%
- E 26%

- 888 How many litres of water gas are produced by 44.8 litres of propane during combustion in standard conditions?



The reaction has to be balanced.

- A 44.8 l
- B 22.4 l
- C 89.6 l
- D 179.3 l
- E 358.4 l

- 889 The yield of the following reaction is 25%. Starting from 5.6 kg of calcium oxide, calculate the grams of calcium carbonate obtained.



Calcium atomic weight is 40 u.m.a.; carbon atomic weight is 12 u.m.a.; oxygen atomic weight is 16 u.m.a.

- A 2.5 kg
- B 5 kg
- C 11.2 kg
- D 2.8 kg
- E 2 kg

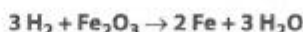
- 890 Which one of these reactions is NOT a redox?

- A $\text{CH}_4 + 2 \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
- B $\text{FeCl}_2 \rightarrow \text{Fe} + \text{Cl}_2$
- C $\text{Cu}(\text{NH}_3)_4^{2+} + 2 \text{HNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + 2 \text{NH}_4^+ + 2 \text{NH}_3$
- D $6 \text{FeSO}_4 + \text{Cu}_2\text{Cr}_2\text{O}_7 + 4 \text{H}_2\text{SO}_4 \rightarrow \text{Cu}_2\text{SO}_4 + \text{Cr}_2\text{O}_3 + 3 \text{Fe}_2(\text{SO}_4)_3 + 4 \text{H}_2\text{O}$
- E $3 \text{I}_2 + 6 \text{KOH} \rightarrow 5 \text{KI} + \text{KIO}_3 + 3 \text{H}_2\text{O}$

- 891 Why do many disinfectants contain sodium hypochlorite?

- A Because it is a stron
- B Because it is a nutrient of bacteria
- C Because it has a bad smell
- D Because it is a strong oxidant
- E Sodium hypochlorite is not a disinfectant

- 892 Given this reaction:



which one of the following is NOT correct?

- A Hydrogen is the reducing agent
- B The grams of iron are twice as many as those of ferric oxide
- C This reaction in not an acid base reaction
- D The moles of hydrogen are the same as those of water
- E Hydrogen at room temperature is a gas

893 Mass analysis of a certain compound shows that it contains 14 percent hydrogen and 86 percent carbon. Which of the following is the most informative statement that can properly be done about the compound with these data?

- A** It is a hydrocarbon
- B** Its empirical formula is CH_2
- C** Its molecular formula is C_2H_4
- D** Its molar mass is 28 g/mol
- E** It contains a triple bond

894 Which of the following solutions has the highest pH?

- A** 0.1 M HCl
- B** 0.1 M NaCl
- C** 0.1 M NH_3
- D** 0.1 M CH_3OH
- E** 0.1 M KOH

895 Which rows of the table correctly describe the reactions of the aqueous acids with amines and amides?

		Amines	Amides
Row 1	Ethanoic acid	reacts	does not react
Row 2	Nitrous acid	reacts	reacts
Row 3	Sulphuric acid	does not react	hydrolyses

- A** None of the rows
- B** Rows 1 and 2
- C** Rows 1 and 3
- D** Rows 2 and 3
- E** All of the rows

896 The hydrogen ion concentration of a solution prepared diluting 50.0 ml of 0.10 M HCl with water to 500.0 ml of solution is:

- A** 0.0010 M
- B** 0.0050 M
- C** 0.010 M
- D** 0.050 M
- E** 1.0 M

897 The number of oxygen atoms in 0.50 mole of KHSO_4 is:

- A** $1.2 \cdot 10^{23}$
- B** $2.4 \cdot 10^{23}$
- C** $3.0 \cdot 10^{23}$
- D** $1.2 \cdot 10^{24}$
- E** $2.4 \cdot 10^{24}$

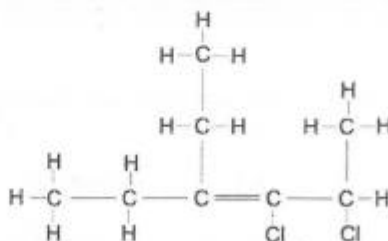
- 898 Which of the following statements about air is correct?
- A Its major constituent is hydrogen
 - B It is a heterogeneous solution
 - C There is about 1% of argon
 - D There is not presence of carbon dioxide
 - E Nitrogen and oxygen react at room temperature producing nitrogen oxide causing acid rain

- 899 How many potassium ions are contained in 100 ml of 5 M potassium sulphide solution?
- A 1
 - B $3.01 \cdot 10^{23}$
 - C $3.01 \cdot 10^{24}$
 - D $6.02 \cdot 10^{23}$
 - E 0.5

- 900 About solubility properties of water which of these are true?
1. All ionic compounds are soluble in water
 2. The presence of nonbonding electron pairs increases the solubility of covalent compounds
 3. The solubility of all the substances increases with temperature
- A Only 2
 - B 1 and 2
 - C Only 3
 - D All are true
 - E None is true

- 901 Calculate the molarity of a solution containing 50 g of calcium carbonate in 500 ml of distilled water. (CaCO_3 molecular weight = 100 a.m.u.).
- A $1 \cdot 10^{-3}$ M
 - B $1 \cdot 10^{-4}$ M
 - C $1 \cdot 10^{-1}$ M
 - D 1 M
 - E $5 \cdot 10^{-2}$ M

- 902 Identify the correct IUPAC name for the following organic structure:



- A 2,3-dichloro-4-ethylhex-3-ene
- B 1,2-dichloro-4-ethyl-1-methylpent-2-ene
- C 1-chloro-2-chloro-3-ethyl-1-methylpent-2-ene
- D 4,5-dichloro-3-ethyl-5-methylpent-3-ene
- E 2,3-dichloro-4,4-diethylhex-3-ene

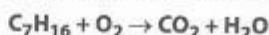
- 903 A solution is composed by 3 grams of sodium fluoride and 9 grams of water. Which is the % w/w of sodium fluoride in this solution? (NaF molecular weight = 42 a.m.u.)
- A 33%
 - B 0.8%
 - C 8%
 - D 21%
 - E 25%
-
- 904 In a combustion reaction there is always:
- A the presence of methane
 - B the production of two moles of water
 - C all the reagents at the liquid state
 - D an exchange of electrons
 - E an acid base equilibrium
-
- 905 Consider the following reactions:
- $$\text{MgCO}_3 \rightarrow \text{MgO} + \text{CO}_2$$
- $$\text{HCl} + \text{KOH} \rightarrow \text{KCl} + \text{H}_2\text{O}$$
- $$\text{Li}_2\text{S} + 2 \text{CsNO}_3 \rightarrow \text{Cs}_2\text{S} + 2 \text{LiNO}_3$$
- Which type of reaction is NOT included in the list?
- A Ionization
 - B Decomposition
 - C Acid/Base
 - D Double exchange
 - E Neutralization
-
- 906 In a chemical reaction $\text{Na}^+_{(\text{aq})}$ reacting with an organic compound passes to $\text{Na}_{(\text{s})}$. Which of the following is correct?
- A The sodium cation is oxidized by a strong oxidant
 - B This is an acid/base reaction
 - C It is impossible to reduce sodium cation because it is a very weak acid
 - D The organic compound is a strong electrophilic agent
 - E It is a difficult reaction because of the first ionization energy of sodium
-
- 907 A solution composed by water and potassium bromide is 60% w/V. If 500 ml of this solution is totally evaporated how many grams of potassium bromide remain?
- A 30 g
 - B 60 g
 - C 3 g
 - D 1200 g
 - E 300 g
-
- 908 Which one is the correct definition of molar fraction X?
- A Is the ratio between the grams of a specie and the total grammes of the solution
 - B Is the ratio between the moles of a specie and the total moles of the solution
 - C Is the ratio between the moles of a species and the total grammes of the solution
 - D Is the ratio between the grams of a specie and the total volume of the solution
 - E None of the above

- 909** A solution is composed by 4 elements: A, B, C and D. The molar fraction of A is 0.2; the addition of the molar fraction of B and D is 0.82. Then:
- A** molar fraction of C is 0.62
 - B** C has a molar fraction surely smaller than A
 - C** B is the major constituent of the solution
 - D** A is the minor constituent of the solution
 - E** given the previous molar fraction this solution cannot exist
-
- 910** Which of the following statements is NOT correct?
- A** In a covalent bond the strength of the bond is proportional to its length
 - B** The ionic bond is always formed between a cation and an anion
 - C** Covalent bond is directional
 - D** Hydrogen bond is not a covalent bond
 - E** In a double covalent bond there are four electrons shared between the two atoms
-
- 911** Which is the longest bond among the following?
- A** Double C-C
 - B** Triple C-C
 - C** Single C-O
 - D** Triple C-N
 - E** Triple C-O
-
- 912** Which of these pairs of atoms could form an ionic bond?
- A** Carbon and phosphor
 - B** Hydrogen and oxygen
 - C** Sodium and calcium
 - D** Carbon and chlorine
 - E** Calcium and bromine
-
- 913** Which is the weakest interaction among these?
- A** Van der Waals forces
 - B** Hydrogen bond
 - C** Covalent bond
 - D** Ionic bond
 - E** Metallic bond
-
- 914** Which is the general formula of a carbohydrate?
- A** $C_n(H_2O)_m$ with $n = m$
 - B** $C_n(H_2O)_m$ with $n \geq m$
 - C** $C_n(H_2O)_m$ with $n \leq m$
 - D** $C_n(OH)_m$ with $n = m$
 - E** There is not a general formula for carbohydrates
-
- 915** Which of these carbohydrates is NOT a monosaccharide?
- A** Sucrose
 - B** Fructose
 - C** Ribose
 - D** Deoxyribose
 - E** Arabinose

- 916 A solution of hydrogen peroxide is 5% v/v. How many moles of hydrogen peroxide are there in 500 ml of solution?
(hydrogen peroxide density = 0.8 g/ml, molecular weight = 46)
- A 0.86 mol
 - B 0.43 mol
 - C $1 \cdot 10^{23}$ mol
 - D 0.017 mol
 - E 0.54 mol
-
- 917 Choose the correct residual R of glycine:
- A Cl
 - B CH_3
 - C H
 - D NH_2
 - E CH_2CH_3
-
- 918 How many grams of calcium nitrate (molecular weight = 164 a.m.u.) are contained in 50 ml of a 2 M solution?
- A 0.1 g
 - B 1.64 g
 - C 16.4 g
 - D 82 g
 - E 3.28 g
-
- 919 How many π -bonds are there in a molecule of carbon dioxide?
- A 0
 - B 1
 - C 4
 - D 2
 - E $1/2$
-
- 920 How many ml of water have to be added to 200 ml of 1 M solution to obtain a new solution 0.1 M?
- A 200
 - B 2200
 - C 500
 - D 20
 - E 800
-
- 921 40 grams of sodium hydroxide (molecular weight = 40 a.m.u.) are dissolved in 1kg of distilled water. Determine the molarity and the molality of the solution.
- A 1 m and 1 M
 - B 1 m and 2 M
 - C 2 m and 2 M
 - D 0.1 m and 2 M
 - E 0.1 m and 0.1 M

- 922 What is the equivalent weight?**
 (A) The ratio between numbers of moles of a substance and the number of equivalent
 (B) The ratio between the molecular weight and the litres of solution
 (C) The ratio between molecular weight and the number of equivalent
 (D) The product between number of moles and molecular weight
 (E) The ratio between number of moles and molecular weight
- 923 Which is the final normality of 1 l solution obtained diluting 200 ml of 2 N CaCO_3 solution?**
 (A) 0.2 N
 (B) 0.4 N
 (C) 10 N
 (D) 1 N
 (E) 0.1 N
- 924 Which the following solutions has the lowest osmolarity?**
 (A) Fructose 2 M
 (B) Magnesium phosphate 0.5 M
 (C) Beryllium sulphate 0.8 M
 (D) Sodium chloride 2 M
 (E) Potassium perchlorate 0.5 M
- 925 The charge of an atom that has 12 protons, 12 neutrons and 11 electrons is:**
 (A) 0
 (B) -1
 (C) -2
 (D) +3
 (E) +1
- 926 Which of these kinds of isomerism cannot be of an alkene?**
 (A) Isomerism of position
 (B) Optic isomerism
 (C) Isomerism of structure
 (D) Conformational isomerism
 (E) Isomerism of functional group
- 927 Is the compound CHFClBr chiral or not? Choose the correct statement.**
 (A) It is chiral because the central carbon is hybridized sp^2
 (B) It is not chiral because it has not four different atoms substituents on the central carbon
 (C) It is chiral because three substituents are different atoms
 (D) It is not chiral because all the bonds are π bonds
 (E) It is chiral because the carbon has four different substituents
- 928 Which kind of compound could have this formula: C_5H_{10} ?**
 (A) Alkane
 (B) Alkene
 (C) Alkyne
 (D) Cycloalkane
 (E) It could be either an alkene or a cycloalkane

929 Choose the correct stoichiometric coefficients for the following reaction:



- A 7; 15/2; 7; 8
- B 1; 15/2; 7; 8
- C 1; 11; 7; 8
- D 1; 11; 7; 7
- E 7; 15/2; 7; 7

930 Which of the following properties is NOT characteristic of an electron?

- A Its mass is four orders of magnitude smaller than neutrons and protons
- B It has a negative charge
- C If electrons are more than protons, the specie is a cation
- D Its position is defined by four quantum numbers
- E It is not present in the atomic nucleus

931 Which of the following substances is not an element?

- A Nitrogen
- B Hydrogen
- C Neon
- D Sulphur
- E Steel

932 Consider the following dynamic equilibrium:



Which of the following changes to conditions would cause an increase in the yield of methanol?

1. increase in temperature
2. add a catalyst
3. remove some H_2
4. increase in pressure
5. add more CO

- A 4 and 5 only
- B 1 and 4 only
- C 1 and 3 only
- D 2, 4 and 5 only
- E 1, 2 and 3 only

933 Which is the empirical formula of a molecule whose percentage of carbon mass is 75% and of hydrogen mass is 25%?

(Carbon atomic weight = 12 a.m.u., hydrogen atomic weight = 1 a.m.u.)

- A CH
- B CH_4
- C C_3H
- D C_2H
- E CH_3

934 Which kind of bond is formed between oxygen and chlorine?

- A** Nonpolar covalent bond
- B** Ionic bond
- C** Polar covalent bond
- D** Metallic bond
- E** Hydrogen bond

935 Which one of these substances could be a strong electrolyte?

- A** Milk
- B** Glucose
- C** Sodium chloride
- D** Acetic acid
- E** Ferric Hydroxide

936 Which one of these solutions has the highest osmotic pressure at the 298K?

- A** Glucose 0.4 M
- B** Sodium sulphide 0.3 M
- C** Sodium chloride 0.2 M
- D** Sodium fluoride 0.3 M
- E** Calcium sulphate 0.3 M

937 A glucose solution has the same osmotic pressure of a potassium chloride solution, at the same temperature. Which one of the following is correct?

- A** They have the same molarity
- B** They have the same Van't Hoff coefficient
- C** Molarity of potassium chloride is twice as much as glucose solution
- D** It is impossible that this solution has the same osmotic pressure
- E** Molarity of potassium chloride is half as much as glucose solution

938 The maximum number of electrons contained in a covalent bond is:

- A** two
- B** four
- C** three
- D** six
- E** eight

939 "Chemical kinetic studies the velocity of the reaction. Every reaction has a velocity, the range of velocity is very vast; for example there are very fast reactions like explosion, and very slow reactions like radioactive decay. This fact is one of the biggest problems of the nuclear energy, because in general even if a reaction is thermodynamically favoured, it could be kinetically disadvantaged."

Which one of the following statements is NOT correct according to the previous text?

- A** The velocities of the reactions are very different between them
- B** The radioactive decay is always thermodynamically disadvantaged
- C** Very slow radioactive decay is a problem for nuclear energy
- D** A thermodynamically favoured reaction could be kinetically disadvantaged
- E** Explosions are usually very fast reaction

940 Which of the following atoms has the same number of electrons as Mg^{2+} ?

- A** Kr
- B** Ne
- C** Ar
- D** Na
- E** O

941 Which four of the following oxides give acidic aqueous solutions? CO , CO_2 , SO_2 , SO_3 , NO , NO_2

- A** CO_2 , SO_2 , SO_3 , NO_2
- B** CO , CO_2 , SO_2 , SO_3
- C** CO , CO_2 , NO , NO_2
- D** CO_2 , SO_3 , NO , NO_2
- E** SO_2 , SO_3 , NO , NO_2

942 When in a reaction $\Delta G = 0$ you can state that:

- A** the reaction is at the equilibrium
- B** the reaction is very slow
- C** the reaction is spontaneous
- D** the reaction is not spontaneous
- E** the reaction is finished

943 Bromine, Br_2 , dissolves in unsaturated hydrocarbons and reacts immediately. Which of the following statements is the best description of this process?

- A** Bromine is polar and reacts by adding bromine atoms to the double bond
- B** Bromine is polar and reacts by substituting hydrogen with bromine atoms
- C** Bromine is non-polar and reacts by substituting hydrogen with bromine atoms
- D** Bromine is non-polar and reacts by adding bromine atoms to the double bond
- E** None of these statements describes the reaction of bromine with unsaturated hydrocarbons correctly

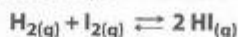
944 Which of the following solutions reacts with an equal volume of 0.05 M $Ba(OH)_2$ giving a pH = 7 solution?

- A** 0.1 M $HClO_4$
- B** 0.1 M KCl
- C** 0.1 M NH_3
- D** 0.1 M CH_3OH
- E** 0.1 M $NaOH$

945 Which one of these properties is NOT characteristic of a catalyst?

- A** It doesn't change the value of the equilibrium constant for a given reaction
- B** It is unchanged at the end of the reaction
- C** Enzymes are an example of biological catalyst
- D** It helps to lower the entropy of the reaction
- E** It speeds up the reaction

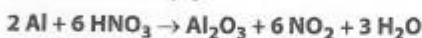
946 Synthesis of iodhydric acid is the following:



What happened if at the equilibrium the pressure in the reactor is increased?

- A Nothing changes
- B The reaction moves to the right
- C The reaction moves to the left
- D The reaction increases its velocity
- E The reaction becomes spontaneous

947 In these reactions, which substances are acting as a reducing agent?



- A Fe, Al, Pb
- B C, Al, Pb
- C C, N, Mn
- D Fe, Al, Mn
- E C, Al, Mn

948 The NaCl solubility in water is 358 g/l at room temperature. What can we say if 200 g of salt are contained in 500 ml of water?

- A The system is homogeneous
- B There is a solid residual of 158 g of salt
- C All salt is solubilized in water
- D The system is heterogeneous
- E There is a solid residual of 79 g of salt

949 Which is the equation describing the CaF_2 dissolution of in water?

- A $K_{ps} = [\text{Ca}^{2+}] \cdot [\text{F}^-]^2$
- B $K_{ps} = [\text{Ca}^{2+}] \cdot [\text{F}^-]$
- C $K_{ps} = [\text{Ca}^{2+}]^2 \cdot [\text{F}^-]^2$
- D $K_{ps} = \frac{[\text{Ca}^{2+}]}{[\text{F}^-]^2}$
- E $K_{ps} = \frac{[\text{Ca}^{2+}]^2}{[\text{F}^-]^2}$

950 Which of the following atoms has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^4$?

- A Ar
- B O
- C S
- D Ti
- E U

- 951 Choose the correct compounds to complete the following table, where ethene reacts with different molecules.

	H ₂	HCl	H ₂ O and acid	Br ₂
Ethene				

- A** Ethane; chloroethane; acid etanoic; 1,1-dibromoethane
B Ethane; dichloroethane; ethanol; 1,2-dibromoethane
C Ethanol; chloroethane; acid etanoic; 1,2-dibromoethane
D Ethane; chloroethane; ethanol; 1,2-dibromoethane
E Ethane; dichloroethane; acid etanoic; bromoethane

- 952 Alkene is a nucleophilic substrate, so:

- A** it preferably reacts with strong electrophilic reagents like OH⁻
B It is not stable, then the alkenes react with many kinds of nucleophilic and electrophilic reagents
C it preferably reacts with other nucleophilic reagents like carbonyl group
D it always reacts with other alkenes without the presence of catalyst to give polymer
E it produces addition reactions with electrophilic compounds

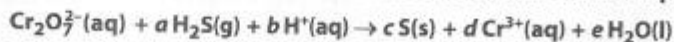
- 953 Which is the monomer of PVC?

- A** Vinyl acid
B Ethene
C Chloroethane
D Vinyl chloride
E Artificial amino acids

- 954 Which synthetic route should you choose to obtain an alkane starting from an alkyne?

- A** Reducing the alkyne two times with molecular hydrogen and catalyst, typically palladium or platinum
B Oxidizing the correspondent alkyne two times with molecular hydrogen and the correct catalyst
C Attacking with a strong acid the alkyne and after dehydrogenating the compound previously obtained
D Dehydrogenating the alkyne with a pyrolysis process
E None of the above

- 955 By using standard techniques to balance chemical equations and ensuring that the net charge is equal on both sides, find the correct value for 'c' in the balanced equation below:



- A** 3
B 1
C 2
D 4
E 6

956 How many atoms of hydrogen has the *ter*-butanol molecule?

- A** 1
- B** 2
- C** 6
- D** 9
- E** 10

957 Which of the following compounds has the highest boiling point?

- A** Ethanol
- B** Ethan
- C** Propanol
- D** Propane
- E** Methanol

958 Which kind of compound is obtained by oxidizing isopropanol?

- A** Propane
- B** Propanone
- C** Propanol
- D** Propional
- E** No product is obtained

959 Which kind of compound could be $\text{CH}_3\text{COOCH}_3$?

- A** Ester
- B** Ketone
- C** Aldehyde
- D** Anhydride
- E** Acetal

960 Which is the formula of dodecanoic acid?

- A** $\text{CH}_3(\text{CH}_2)_9\text{COOH}$
- B** $\text{CH}_3(\text{CH}_2)_{10}\text{COOH}$
- C** $\text{CH}_3(\text{CH}_2)_9\text{COH}$
- D** $\text{CH}_2(\text{CH}_2)_9\text{COOH}$
- E** $\text{CH}_3(\text{CH}_2)_9\text{COOCH}_3$

961 Arrange the following in ascending order of the number of molecules present.

1. 5.00 g Br_2
2. 2.00 g CH_4
3. 1.12 dm^3 SO_3 (g)

Use relative atomic mass: $\text{H} = 1$; $\text{C} = 12$; $\text{O} = 16$; $\text{S} = 32$; $\text{Br} = 80$. Take the volume of 1 mole of gas to be 22.4 dm^3 .

- A** 1, 3, 2
- B** 1, 2, 3
- C** 2, 1, 3
- D** 3, 1, 2
- E** 2, 3, 1

- 962 What do methane and water have in common?**
- A** The tetrahedral geometry
 - B** The presence of hydrogen bond
 - C** The same polarity
 - D** The same molecular weight
 - E** The same smell
-
- 963 The Avogadro constant is $6.0 \times 10^{23} \text{ mol}^{-1}$. How many hydrogen atoms are contained in 0.420 g of cyclohexane? [Ar: H = 1; C = 12]**
- A** 3.0×10^{21}
 - B** 1.8×10^{22}
 - C** 3.0×10^{22}
 - D** 3.6×10^{22}
 - E** 1.8×10^{23}
-
- 964 Which is the nitrogen ibridation in ammonia?**
- A** sp
 - B** sp^2
 - C** sp^3
 - D** sp^3d
 - E** sp^3d^2
-
- 965 Which of these properties is NOT characteristic of the p orbitals?**
- A** They are oriented in the space
 - B** They are anisotropic
 - C** If they have the same principal quantum number of an orbital s , they have higher energy
 - D** They contain maximum 3 electrons
 - E** Their second quantum number l is 1
-
- 966 Ammonia molecular weight is 17 a.m.u., then how many moles correspond to 34 mg of this compound?**
- A** 2 moles
 - B** 0.2 moles
 - C** 0.5 millimoles
 - D** 2 millimoles
 - E** 0.5 moles
-
- 967 Which of these reactions generates triglycerides?**
- A** Oxidation of a fatty acid
 - B** Reduction of glycerol
 - C** Esterification between three fatty acids and one glycerol
 - D** Substitution between fatty acids and fatty alcohols linked to glycerol
 - E** Hydrolysis of cellular membrane

- 973** In a molecule, when an atom has the lowest oxidation state it means that this atom:
- A** is bigger than the others
 - B** is always a metal
 - C** has a value of electronegativity bigger than the other atoms
 - D** is always part of an anion
 - E** is a halogen
-
- 974** Which is the maximum oxidation state reached by one alogen atom?
- A** +8
 - B** +7
 - C** +5
 - D** -1
 - E** It depends on the halogen
-
- 975** Which is the oxidation number of Cu in $\text{Cu}_2(\text{SO}_3)_2$?
- A** +1
 - B** 0
 - C** -2
 - D** +2
 - E** +3
-
- 976** Which of these elements has the highest value of electronegativity?
- A** S
 - B** O
 - C** Cl
 - D** N
 - E** F
-
- 977** Across the periodic table for period 3 (Na to Cl) which of the following trends is/are correct?
1. Electronegativity values only increase
 2. First ionisation energies only decrease
 3. Atomic radii only increase
- A** 1 only
 - B** 2 only
 - C** 3 only
 - D** 1 and 3 only
 - E** 2 and 3 only
-
- 978** How many moles of water (18 a.m.u.) are contained in a glass filled with 200 ml of water, at room temperature?
- A** 0.09 moles
 - B** $6.02 \cdot 10^{23}$ moles
 - C** 11 moles
 - D** 11 millimoles
 - E** It is not possible to determine

979 What can you state about a reaction that has $\Delta H > 0$ and $\Delta S > 0$?

- A** It is not spontaneous at every temperature
- B** It is spontaneous only at elevated temperature
- C** It is spontaneous only at low pressure
- D** It is always spontaneous
- E** It is spontaneous only at low temperature

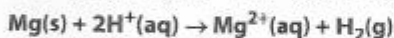
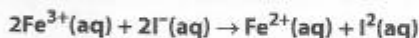
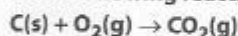
980 In a water molecule the two hydrogen atoms are linked to the oxygen atom by:

- A** two ionic bonds
- B** two polar covalent bonds
- C** two hydrogen bonds
- D** two metallic bonds
- E** two nonpolar covalent bonds

981 Which one of the following statements is true about a weak base?

- A** It could be an hydroxide of alkali metal
- B** If it has equal molarity with respect to a strong base its pOH is lower
- C** It has always a value of pH lower than a strong base
- D** It doesn't react with strong acid
- E** It is never totally dissociated in water

982 In the following reactions, which substances are acting as oxidizing agents?



- A** C(s), $\text{Fe}^{3+}\text{(aq)}$, $\text{H}^+\text{(aq)}$
- B** $\text{O}_2\text{(g)}$, $\text{I}^-\text{(aq)}$, Mg(s)
- C** $\text{O}_2\text{(g)}$, $\text{I}^-\text{(aq)}$, $\text{H}^+\text{(aq)}$
- D** C(s), $\text{Fe}^{3+}\text{(aq)}$, Mg(s)
- E** $\text{O}_2\text{(g)}$, $\text{Fe}^{3+}\text{(aq)}$, $\text{H}^+\text{(aq)}$

983 The empirical formula of benzene is:

- A** CH
- B** C_2H_2
- C** CH_2
- D** CH_4
- E** C_6H_6

984 Which is the percentage composition of the carbon dioxide (CO_2)?

(Atomic weight of carbon = 12 a.m.u., atomic weight of oxygen = 16 a.m.u.)

- A** C 27 %, O 73%
- B** C 33%, O 67%
- C** C 43%, O 57%
- D** C 50%, O 50%
- E** C 67%, O 33%

- 985 An α particle is:**
- A** a radiation screened only by golden paper
 - B** an atom of helium with 6 neutrons
 - C** an atom of hydrogen with a positive charge
 - D** the bivalent cation of helium
 - E** a radiation that can't be screened by anything
-
- 986 Sulphur and oxygen are both in the sixth group, therefore:**
- A** they have the same electronegativity
 - B** they have the same number of electrons
 - C** they have six electrons in the external electronic configuration
 - D** they are isotopes
 - E** oxygen has got a bigger atomic radius
-
- 987 Which is the difference between the two nuclides O-16 and O-15?**
- A** The first has an electron more than the latter
 - B** The latter has got one proton less than the first
 - C** They have a different number of neutrons
 - D** The latter is heavier than the first
 - E** The first has got an electron less than the latter
-
- 988 What is the conjugated base of HSO_4^- ?**
- A** SO_3^-
 - B** SO_4^-
 - C** H_2SO_4
 - D** HSO_3^-
 - E** SO_4^{2-}
-
- 989 Which is the hydride ion?**
- A** H^-
 - B** OH^-
 - C** H^+
 - D** H_3O^+
 - E** H_3O_4^+
-
- 990 The electronic affinity raises in the periodic table of the elements:**
- A** from left to right and from top to bottom
 - B** from right to left and from top to bottom
 - C** casually
 - D** from right to left and from bottom to top
 - E** from left to right and from bottom to top
-
- 991 What happens by increasing the temperature in an endothermic reaction?**
- A** The reaction moves to the left
 - B** Nothing changes
 - C** The equilibrium is reached fast
 - D** The reaction moves to the right
 - E** None of the above

992 The Proust's law states that:

- A** the mass of an isolated system remains constant over time
- B** the product of volume and pressure of a gas in a confined region is constant
- C** in standard conditions one mole of a gas occupies a volume of 22.414 litres
- D** a chemical compound contains the same proportions of elements by mass
- E** none of the above is correct

993 Which of the following series contains only alkaline elements?

- A** Na, Be, Cs
- B** K, Cs, Ca
- C** Li, Cs, Na
- D** Li, K, Be
- E** S, K, Li

994 Two molecules are isoelectronic when they have the same number of electrons. Which of these pairs of molecules is isoelectronic?

- A** PH_3 and NH_3
- B** CH_4 and NO
- C** CH_4 and NH_4^+
- D** NO and CO
- E** H_2S and O_2

995 10 ml of a solution containing hydrochloric acid 0.1 M is diluted to 100 ml. Which is the pH of the final solution?

- A** 0.1
- B** 1
- C** 10
- D** 2
- E** 1.1

996 Which one of the following statements is correct about the first and the second electron affinities of oxygen?

- A** First = slightly exothermic; second = very endothermic
- B** First = slightly exothermic; second = very exothermic
- C** First = slightly endothermic; second = very exothermic
- D** First = slightly endothermic; second = very endothermic
- E** First = very exothermic; second = very exothermic

997 In the stars, one of the most important reactions is the production of helium starting from hydrogen. Which of the following statements is NOT correct?

- A** Helium's atomic number is twice as much as hydrogen's atomic number
- B** This reaction is called nuclear fusion
- C** This reaction is a redox
- D** This reaction is a nuclear reaction
- E** Hydrogen is lighter than helium

998 What is the total number of electrons in the ions of sodium chloride?

- A** Sodium ion = 10; chloride ion = 18
- B** Sodium ion = 8; chloride ion = 8
- C** Sodium ion = 10; chloride ion = 17
- D** Sodium ion = 11; chloride ion = 17
- E** Sodium ion = 11; chloride ion = 18

999 Which is the oxidation number of S in the hydrogen sulphide?

- A** 0
- B** +2
- C** +4
- D** +6
- E** -2

1000 Which of the following atoms is NOT a halogen?

- A** Fluorine
- B** Sulphur
- C** Chlorine
- D** Iodine
- E** Astatine

Soluzioni

Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta
851	A	852	E	853	A	854	C	855	B	856	B	857	D	858	D	859	D	860	A		
861	D	862	C	863	A	864	E	865	B	866	C	867	C	868	E	869	D	870	B		
871	A	872	D	873	D	874	B	875	E	876	A	877	B	878	D	879	C	880	B		
881	C	882	C	883	E	884	E	885	A	886	E	887	C	888	D	889	A	890	C		
891	D	892	B	893	B	894	E	895	B	896	C	897	D	898	C	899	D	900	E		
901	D	902	A	903	E	904	D	905	A	906	D	907	E	908	B	909	E	910	A		
911	C	912	E	913	A	914	B	915	A	916	B	917	C	918	C	919	D	920	E		
921	A	922	C	923	B	924	E	925	E	926	B	927	E	928	E	929	C	930	C		
931	E	932	A	933	B	934	C	935	C	936	B	937	E	938	D	939	B	940	B		
941	A	942	A	943	D	944	A	945	D	946	A	947	D	948	D	949	A	950	C		
951	D	952	E	953	D	954	A	955	A	956	E	957	C	958	B	959	A	960	B		
961	A	962	A	963	D	964	C	965	D	966	D	967	C	968	C	969	B	970	C		
971	E	972	A	973	C	974	E	975	A	976	E	977	A	978	C	979	B	980	B		
981	E	982	E	983	A	984	A	985	D	986	C	987	C	988	E	989	A	990	E		
991	D	992	D	993	C	994	C	995	D	996	A	997	C	998	A	999	E	1000	B		

Introduction

The first part of the book discusses the historical background of the study. It covers the early years of the 20th century, when the study of the human mind was in its infancy. The second part of the book discusses the theoretical framework of the study. It covers the various theories of the human mind, such as behaviorism, psychoanalysis, and cognitive psychology. The third part of the book discusses the methodology of the study. It covers the various methods used to study the human mind, such as experiments, surveys, and case studies. The fourth part of the book discusses the results of the study. It covers the various findings of the study, such as the role of the unconscious mind, the development of the ego, and the importance of the social environment. The fifth part of the book discusses the implications of the study. It covers the various ways in which the study of the human mind can be applied to other fields, such as education, psychology, and medicine.

parte quinta

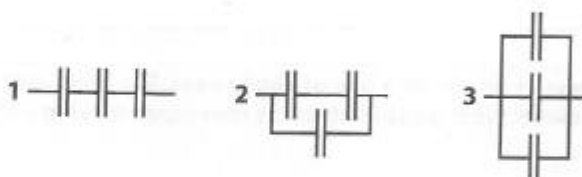
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Quesiti

1001 A block of iron at 100°C is transferred to a plastic cup containing water at 20°C . Which one of the following is NOT necessary in order to find the specific heat capacity of iron?

- A The mass of water
- B The final temperature
- C The mass of the block of iron
- D The specific heat capacity of water
- E The thermal conductivity of the iron

1002 Three identical capacitors are connected as follows:



Which of the following shows the order of increasing capacitance (smallest first)?

- A 1, 2, 3
- B 1, 3, 2
- C 2, 1, 3
- D 2, 3, 1
- E 3, 2, 1

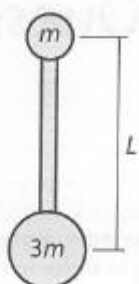
1003 An object rolls along level ground to the right at constant speed. Must there be any forces pushing this object to the right?

- A Yes: the only forces that act must be to the right
- B Yes: but there could also be a friction force acting to the left
- C No: no forces can act to the right
- D No: while there can be forces acting, no force MUST act
- E The answer depends on the speed of the object

1004 Which one of the following is NOT a vector?

- A Velocity
- B Weight
- C Acceleration
- D Electric charge
- E Electric field

- 1005 A mass m is attached to a mass $3m$ by a rigid bar of negligible mass and length L . Initially, the smaller mass is located directly above the larger mass, as shown below.

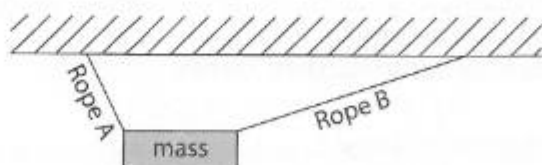


How much work is necessary to flip the rod 180° so that the larger mass is directly above the smaller mass?

- A $4mgL$
 - B $2mgL$
 - C mgL
 - D $4\pi mgL$
 - E $2\pi mgL$
- 1006 A man of mass 75 kg lies on a bed of 10000 nails. The tip of each nail has an area of 1.0 square millimetre. What pressure does the man experience? [$g = 10\text{ N/kg}$]

- A $7.5 \times 10^3\text{ Pa}$
- B $7.5 \times 10^4\text{ Pa}$
- C $7.5 \times 10^5\text{ Pa}$
- D $7.5 \times 10^6\text{ Pa}$
- E $7.5 \times 10^7\text{ Pa}$

- 1007 A mass hangs from two ropes at unequal angles, as shown below.



Which of the following makes correct comparisons of the horizontal and vertical components of the tension in each rope?

- A Horizontal tension: greater in rope B; vertical tension: greater in rope B
- B Horizontal tension: equal in both ropes; vertical tension: greater in rope A
- C Horizontal tension: greater in rope A; vertical tension: greater in rope A
- D Horizontal tension: equal in both ropes; vertical tension: equal in both ropes
- E Horizontal tension: greater in rope B; vertical tension: equal in both ropes

1008 A proton moves in a straight line. Which of the following combinations of electric or magnetic fields could NOT allow this motion?

- A Only an electric field pointing in the direction of the proton's motion
- B Only a magnetic field pointing opposite the direction of the proton's motion
- C An electric field and a magnetic field, each pointing perpendicular to the proton's motion
- D Only a magnetic field pointing perpendicular to the proton's motion
- E Only a magnetic field pointing in the direction of the proton's motion

1009 A traveling wave passes a point. At this point, the time between successive crests is 0.2 s. Which of the following statements can be justified?

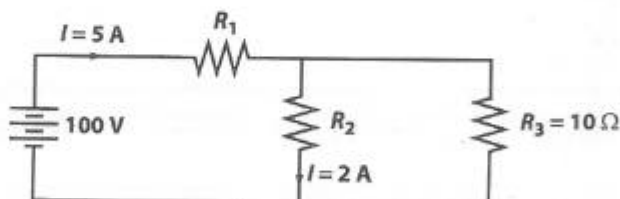
- A The wavelength is 5 m
- B The frequency is 5 Hz
- C The velocity of the wave is 5 m/s
- D The wavelength is 0.2 m
- E The wavelength is 68 m

1010 When cooled below 4.2 K, mercury becomes a superconductor, which means it has no electrical resistance. When a current is passed through mercury under these conditions, which of the following effects will be present?

1. Thermal.
2. Chemical.
3. Magnetic.

- A 1 only
- B 2 only
- C 3 only
- D 1 and 3 only
- E 1, 2 and 3

1011 What is the voltage drop across R_3 in the circuit diagrammed below?



- A 10 V
- B 20 V
- C 30 V
- D 50 V
- E 100 V

1012 Which of the following quantities is NOT a vector?

- A Magnetic field
- B Electric force
- C Electric current
- D Electric field
- E Electric potential

1013 Which of the following must be true of an object in uniform circular motion?

- A** Its velocity must be constant
- B** Its acceleration and its velocity must be in opposite directions
- C** Its acceleration and its velocity must be perpendicular to each other
- D** It must experience a force away from the center of the circle
- E** Its acceleration must be negative

1014 At the melting point, which of the following are correct about paraffin wax?

- 1. The substance becomes more disordered.**
- 2. The wax takes in heat but its temperature stays the same.**
- 3. Bonds between the carbon and hydrogen atoms are broken.**

- A** 1, 2 and 3
- B** 2 only
- C** 1 and 2 only
- D** 1 and 3 only
- E** 2 and 3 only

1015 An aluminium block of mass 2.5 kg is supplied with 9000 J of thermal energy. This causes its temperature to rise by 4 K. Which expression gives the specific heat capacity of this aluminium, from this data?

[Assume that the block remains solid throughout, and that no additional energy is exchanged between the block and the surroundings.]

- A** $\frac{9000 \times 4}{2.5} \text{ J kg}^{-1} \text{ K}^{-1}$
- B** $\frac{9000}{2.5 \times 4} \text{ J kg}^{-1} \text{ K}^{-1}$
- C** $9000 \times 2.5 \times 4 \text{ J kg}^{-1} \text{ K}^{-1}$
- D** $\frac{2.5 \times 4}{9000} \text{ J kg}^{-1} \text{ K}^{-1}$
- E** $\frac{9000 \times 2.5}{4} \text{ J kg}^{-1} \text{ K}^{-1}$

1016 How much work would do a 10 N force acting over 10 m on a 10 kg object?

- A** 0 J
- B** 70.7 J
- C** 100 J
- D** 980 J
- E** 1000 J

1017 What is the magnitude of the free-fall acceleration at a point that is a distance $2R$ above the surface of the Earth, where R is the radius of the Earth?

- A** 4.8 m/s^2
- B** 1.1 m/s^2
- C** 3.3 m/s^2
- D** 2.5 m/s^2
- E** 6.5 m/s^2

1018 Which of the following is not a measure of the same quantity as the others?

- A Newton meter per second
- B Kilogram meter squared per second squared
- C Joule per second
- D Watt
- E They all measure the same quantity

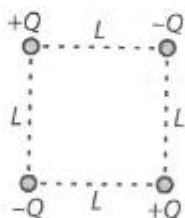
1019 A spaceship of mass m circles a planet (mass = M) in an orbit of radius R . How much energy is required to transfer the spaceship to a circular orbit of radius $3R$?

- A $GmM/2R$
- B $GmM/3R$
- C $GmM/4R$
- D $GmM/6R$
- E $3GmM/4R$

1020 Two identical planets orbit a star in concentric circular orbits in the star's equatorial plane. Of the two, the planet that is farther from the star must have:

- A the smaller period
- B the greater period
- C the smaller gravitational mass
- D the larger gravitational mass
- E the larger universal gravitational constant

1021 If $Q = 20 \mu\text{C}$ and $L = 60 \text{ cm}$, what is the magnitude of the electrostatic force on any one of the charges shown?

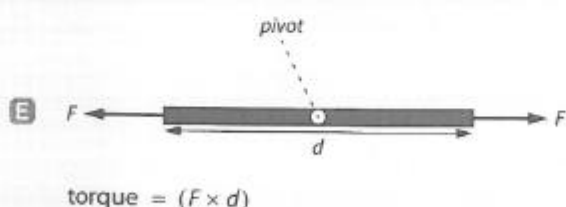
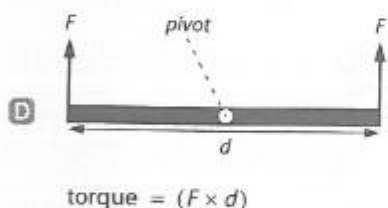
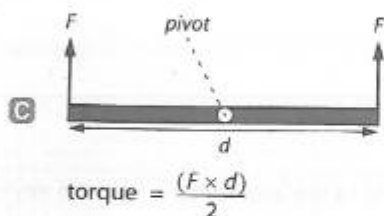
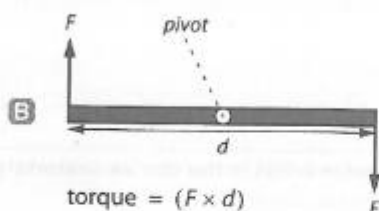
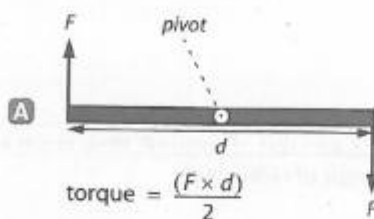


- A 25 N
- B 19 N
- C 15 N
- D 9.1 N
- E 14 N

1022 A particle ($q = 3.0 \text{ mC}$, $m = 20 \text{ g}$) has a speed of 20 m/s when it enters a region where the electric field has a constant magnitude of 80 N/C and a direction which is the same as the velocity of the particle. What is the speed of the particle 3.0 s after it enters this region?

- A 68 m/s
- B 44 m/s
- C 56 m/s
- D 80 m/s
- E 36 m/s

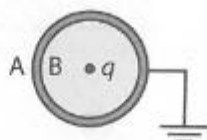
1023 Two forces F of equal magnitude act on a beam. Which diagram shows a couple acting and states the magnitude of the torque (moment) of the couple about the pivot? [The pivot is at the centre of the beam]



1024 A cube of ice (specific gravity 0.90) floats in a cup of water. Several hours later, the ice cube has completely melted into the glass. How does the water level change after melting compared to the initial water level?

- A** The water level is 10% higher after melting
- B** The water level is 90% higher after melting
- C** The water level unchanged after melting
- D** The water level is 10% lower after melting
- E** The water level is 90% lower after melting

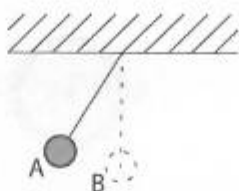
- 1025 A positive point charge q is placed at the center of an uncharged metal sphere insulated from the ground. The outside of the sphere is then grounded as shown. Then the ground wire is removed. A is the outer surface and B is the inner surface.



Which statement is correct?

- A The charge on A is $-q$; that on B is $+q$
 - B The charge on B is $-q$; that on A is $+q$
 - C The charge is on A and on B
 - D There is no charge on either A or B
 - E There is no charge on A; the charge on B is $-q$
- 1026 Two charges lie on the x axis, $+2q$ at the origin, and $-3q$ at $x = 5.0$ m. The point on the x axis where the electric potential has a zero value (when the value at infinity is also zero) is:
- A 1.0 m
 - B 2.0 m
 - C 2.5 m
 - D 3.0 m
 - E 4.0 m
- 1027 The Space Shuttle orbits 300 km above the Earth's surface; the Earth's radius is 6400 km. What is the gravitational acceleration experienced by the Space Shuttle?
- A 4.9 m/s^2
 - B 8.9 m/s^2
 - C 9.8 m/s^2
 - D 10.8 m/s^2
 - E Zero
- 1028 Two isolated particles, A and B, are 4 m apart. Particle A has a net charge of $2Q$, and B has a net charge of Q . The ratio of the magnitude of the electrostatic force on A to that on B is:
- A 4:1
 - B 2:1
 - C 1:1
 - D 1:2
 - E 1:4

- 1029 A ball of mass m on a string swings back and forth to a maximum angle of 30° to the vertical, as shown below.



Which of the following vectors represents the acceleration, a , of the mass at point A, the highest point in the swing?

- A
- B
- C
- D
- E $a = \text{zero}$

- 1030 When an ideal gas is cooled in a container of fixed volume then:

- A both the pressure and the density fall
 B both the pressure and the density rise
 C the pressure falls and the density rises
 D the pressure falls and the density stays the same
 E the pressure stays the same and the density rises

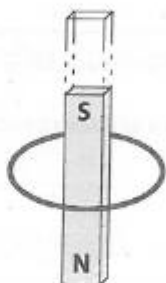
- 1031 Which one of the following equations is dimensionally consistent (has consistent units)? [All the symbols have their usual meanings: v = velocity; F = force; m = mass; t = time; V = voltage; Q = charge; R_1, R_2, R_3, R_4 = resistance]

- A acceleration = $(\frac{1}{2}vt^2) + (F/m)$
 B energy = $(\frac{1}{2}mv^2) + Fv$
 C electrical current = $(V/R_1) + (Q/t)$
 D resistance = $R_1 + R_2 + (1/R_3) + (1/R_4)$
 E temperature change = energy $\times m \times$ specific heat capacity

- 1032 When the number of turns in a solenoid and its length are both doubled, the ratio of the magnitude of the new magnetic field inside to the magnitude of the original magnetic field inside is:

A 0.25
B 0.50
C 1
D 2
E 4

- 1033 A bar magnet is dropped from above and falls through the loop of wire shown below. The north pole of the bar magnet points downward towards the page as it falls.



Which statement is correct?

- A** The current in the loop always flows in a clockwise direction
B The current in the loop always flows in a counterclockwise direction
C The current in the loop flows first in a clockwise, then in a counterclockwise direction
D The current in the loop flows first in a counterclockwise, then in a clockwise direction
E No current flows in the loop because both ends of the magnet move through the loop

- 1034 Rank the following by their wavelengths, from lowest wavelength to highest wavelength:

- Indigo
- Infrared
- Orange
- Ultraviolet
- X-rays

- A** X-rays, Ultraviolet, Orange, Indigo, Infrared
B Ultraviolet, Infrared, Indigo, Orange, X-rays
C X-rays, Indigo, Infrared, Ultraviolet, Orange
D Infrared, Ultraviolet, Orange, Indigo, X-rays
E X-rays, Ultraviolet, Indigo, Orange, Infrared

- 1035 An airplane moves 140 m/s as it travels around a vertical circular loop which has a 1.0 km radius. What is the magnitude of the resultant force on the 70 kg pilot of this plane at the bottom of this loop?

- A** 2.1 kN
B 1.4 kN
C 0.69 kN
D 1.5 kN
E 1.3 kN

1036 A 4.0 kg mass on the end of a string rotates in a circular motion on a horizontal frictionless table. The mass has a constant speed of 2.0 m/s and the radius of the circle is 0.80 m. What is the magnitude of the resultant force acting on the mass?

- A 39 N
- B 20 N
- C 44 N
- D 0 N
- E 30 N

1037 The following equation was obtained by solving a physics problem:

$$\frac{\left(16.0 \frac{\text{m}}{\text{s}}\right)^2}{(75.0 \text{ m})\left(9.80 \frac{\text{m}}{\text{s}^2}\right)} = \tan 19.2^\circ$$

The best physical representation of the situation is:

- A A car traveling at 16.0 m/s is 19.20 into a turn of a quarter circle on a level road
- B A mass on a string that is originally horizontal has fallen to where the angle between the string and the vertical direction is 19.20
- C A mass on a string originally horizontal has fallen 19.20 from the horizontal direction
- D A car travelling at 16.0 m/s is on a circular curve banked at 19.20
- E A car traveling at 16.0 m/s and going over a semicircular mountain-top road is 19.20 down from the top

1038 A satellite circles planet Roton every 2.8 h in an orbit having a radius of 1.2×10^7 m. If the radius of Roton is 5.0×10^6 m, what is the magnitude of the free-fall acceleration on the surface of Roton?

- A 31 m/s^2
- B 27 m/s^2
- C 34 m/s^2
- D 40 m/s^2
- E 19 m/s^2

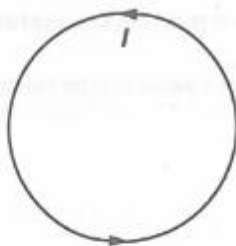
1039 When an object is dropped from a given height h which of the following is true of the values of its kinetic and potential energies at $1/2 h$?

- A Kinetic energy is zero and potential energy is maximum
- B Kinetic energy is zero and potential energy is zero
- C Kinetic energy is $1/2$ maximum and potential energy is $1/2$ maximum
- D Kinetic energy is maximum and potential energy is $1/2$ maximum
- E Kinetic energy is maximum and potential energy is zero

1040 On which of the following physics principles does Kirchhoff's loop rule rest?

- A Conservation of charge
- B Conservation of mass
- C Conservation of energy
- D Conservation of momentum
- E Conservation of angular momentum

- 1041 The circular wire shown below carries a current I in the counterclockwise direction.



What will be the direction of the magnetic field at the center of the wire?

- A Into the page
 - B Out of the page
 - C Down
 - D Up
 - E Counterclockwise
- 1042 A split highway has a number of lanes for traffic. For traffic going in one direction, the radius for the inside of the curve is half the radius for the outside. One car, car A, travels on the inside while another car of equal mass, car B, travels at equal speed on the outside of the curve. Which statement about resultant forces on the cars is correct?
- A The force on A is half the force on B
 - B The force on B is half the force on A
 - C The force on A is four times the force on B
 - D The force on B is four times the force on A
 - E There is no net resultant force on either as long as they stay on the road while turning
- 1043 Which of the following would result in have the highest final velocity?
- I. A 80 kg person gliding down a 20 degree frictionless incline with a vertical displacement of 20 meters.
 - II. A 40 kg person gliding down a 20 degree frictionless incline with a vertical displacement of 20 meters.
 - III. A 80 kg person gliding down a 30 degree frictionless with a vertical displacement of 20 meters.
- A I
 - B I and II
 - C III
 - D I and III
 - E All three cases would result in the same final velocity.
- 1044 When a vector of magnitude 4 units is added to a vector of magnitude 3 units, the magnitude of the resultant vector will be:
- A 0 units, 7 units, or some value between them
 - B 1 units, 7 units, or some value between them
 - C exactly 1 units
 - D exactly 3.5 units
 - E exactly 7 units

- 1045 A student uses the formula $\rho = \frac{R\pi r^2}{l}$ to calculate the resistivity of a cylindrical wire.

The student uses a value for R that is in $k\Omega$, a value for l that is in m, and a value for r that is in mm.

In which unit will the student's value of ρ be calculated?

- A $\mu\Omega m$
- B $m\Omega m$
- C $k\Omega m$
- D $M\Omega m$
- E $G\Omega m$

- 1046 Balloons filled with helium float because helium is lighter than the air surrounding it. However some balloons are filled with hot air and they also float. Which of the following best explains why a hot air balloon rises?

- A The total mass of air in the balloon is greater than the mass of air outside of the balloon
- B The density of hot air is lower than that of the air surrounding the balloon
- C The heat in the balloon pushes on the fabric of the balloon, which forces the balloon upwards
- D The hot air balloon has a hole at the bottom
- E None of the above

- 1047 A satellite is placed in a geosynchronous orbit. In this equatorial orbit with a period of 24 hours, the satellite hovers over one point on the equator. Which statement is true for a satellite in such an orbit?

- A There is no gravitational force on the satellite
- B There is no acceleration toward the center of the Earth
- C The satellite is in a state of free fall toward the Earth
- D There is a tangential force that helps the satellite keep up with the rotation of the Earth
- E The force toward the center of the Earth is balanced by a force away from the center of the Earth

- 1048 Planet Roton has a mass of $4.0 \cdot 10^{23}$ kg and a radius of $2.0 \cdot 10^6$ m. With what speed should a space probe be launched from the surface of Roton so as to achieve a maximum distance of $3.0 \cdot 10^6$ m from the center of Roton?

- A 4.2 km/s
- B 3.9 km/s
- C 3.0 km/s
- D 3.4 km/s
- E 6.0 km/s

- 1049 An uncharged spherical conducting shell surrounds a charge $-q$ at the center of the shell. Then charge $+3q$ is placed on the outside of the shell. When static equilibrium is reached, the charges on the inner and outer surfaces of the shell are respectively:

- A $+q, -q$
- B $-q, +q$
- C $+q, +2q$
- D $+2q, +q$
- E $+3q, 0$

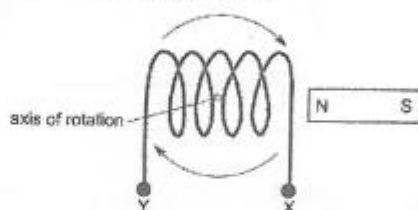
1050 Two identical capacitors are connected in parallel to an external circuit. Which of the following quantities must be the same for both capacitors?

- I. The charge stored on the capacitor
- II. The voltage across the capacitor
- III. The capacitance of the capacitor

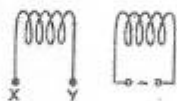
- A I only
- B II only
- C II and III only
- D I and III only
- E I, II, and III

1051 In which of the following situations will an emf (voltage) NOT be induced in the wire between points X and Y on the diagrams?

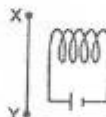
- A A coil of wire rotating in a fixed magnetic field.



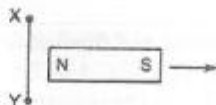
- B A coil of wire held close to another coil carrying an alternating current.



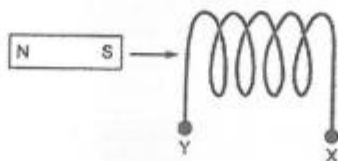
- C A straight wire which is fixed next to a coil of wire carrying a constant direct current.



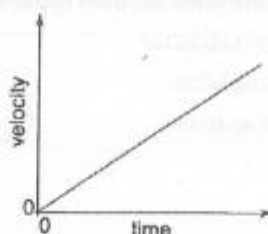
- D A straight wire near a moving magnet.



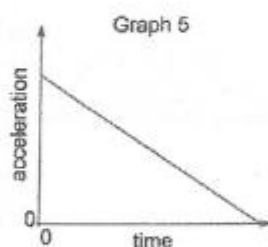
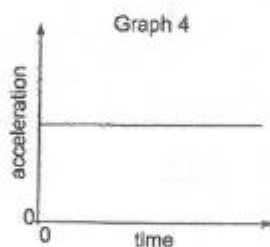
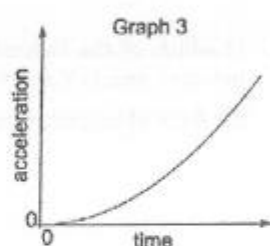
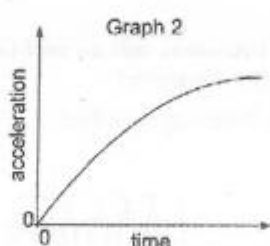
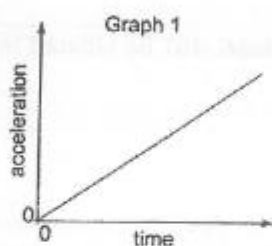
- E A fixed coil of wire into which a magnet moves.



1052 The velocity-time graph for a car moving along a straight road is shown below.



Which graph is the corresponding acceleration-time graph for the car? [All scales are linear.]



- A Graph 1
- B Graph 2
- C Graph 3
- D Graph 4
- E Graph 5

1053 A boat crosses a river of width 100 m and flowing in the east-west direction. The water in the river flows from east to west at a speed of 5 m/s. The boat can travel at a speed of 10 m/s. The boat leaves one bank and the skipper wants to reach the point directly on the opposite bank. What course must she steer?

- A 60° W
- B 30° W
- C 20° W
- D 30° E
- E 60° E

1054 Three identical point charges (+2.0 nC) are placed at the corners of an equilateral triangle with sides of 2.0 m length. If the electric potential is taken to be zero at infinity, what is the potential at the midpoint of any one of the sides of the triangle?

- A** 16 V
- B** 10 V
- C** 70 V
- D** 46 V
- E** 44 V

1055 Two satellites are placed in geosynchronous orbits, orbits with a period of 24 hours, where each satellite hovers over a spot on the Earth's equator. Satellite B has three times the mass of satellite A. What is the relationship between the magnitudes of the gravitational forces of the Earth on the two satellites?

- A** $F_B = \frac{1}{9}F_A$
- B** $F_B = \frac{1}{3}F_A$
- C** $F_B = F_A$
- D** $F_B = 3F_A$
- E** $F_B = 9F_A$

1056 A block of concrete, of mass 100 kg, lies on a 2 m-long plank of wood at a distance 0.5 m from one end. If a builder lifts up the other end of the plank, how much force must he apply to lift the block?

- A** 125 N
- B** 12.5 N
- C** 250 N
- D** 2.5 N
- E** 25 N

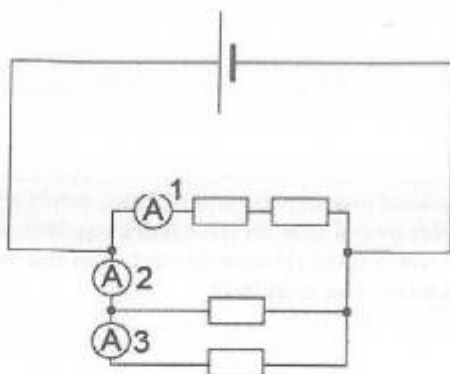
1057 A ball collides with a stationary block on a frictionless surface. The ball sticks to the block. Which of the following would NOT increase the force acting on the ball during the collision?

- A** Increasing the time it takes the ball to change the block's speed
- B** Arranging for the ball to bounce off of the block rather than stick
- C** Increasing the speed of the ball before it collides with the block
- D** Increasing the mass of the block
- E** Anchoring the block in place so that the ball/block combination cannot move after collision

1058 A space shuttle weighing 5000 kg is travelling at 100 m/s upwards. A force of 10000 N acting in the direction of its travel is then applied to it for 5 seconds. What is the resulting change in velocity?

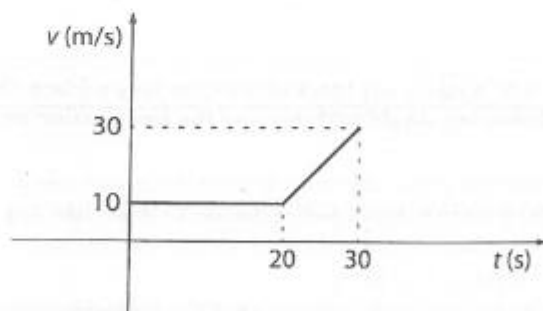
- A** 5 m/s
- B** 7.5 m/s
- C** 10 m/s
- D** 50 m/s
- E** 100 m/s

- 1059 Three ammeters labelled 1, 2 and 3 are connected in the circuit below which contains four identical resistors.



What is the order of readings on the ammeters, smallest to largest? [Assume that the ammeters and wires have negligible resistance.]

- A 2, 3, 1
 - B 3, 2, 1
 - C 1, 3, 2
 - D 1, 2, 3
 - E 3, 1, 2
- 1060 A car was caught in heavy traffic. After 20 s of moving at constant speed, traffic cleared a bit, allowing the car to speed up. The car's motion is represented by the velocity-time graph below.



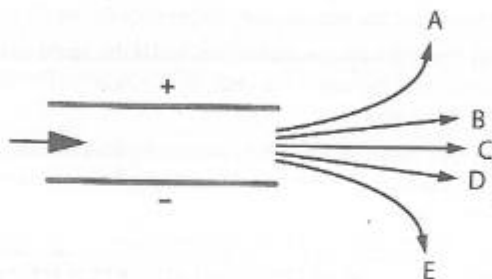
What was the car's acceleration while it was speeding up?

- A 0.5 m/s^2
- B 1.0 m/s^2
- C 1.5 m/s^2
- D 2.0 m/s^2
- E 3.0 m/s^2

- 1061 A block of mass m sits on the ground. A student pulls up on the block with a tension T , but the block remains in contact with the ground. What is the normal force on the block?

(A) $T + mg$
(B) $T - mg$
(C) mg
(D) $mg - T$
(E) T

- 1062 A proton moving at constant velocity enters the region between two charged plates, as shown below.



Which of the paths shown correctly indicates the proton's trajectory after leaving the region between the charged plates?

(A) A
(B) B
(C) C
(D) D
(E) E

- 1063 A heavy block sits on the bottom of an aquarium. Which of the following must be correct about the magnitude of the normal force exerted on the block by the aquarium bottom?

(A) The normal force is equal to the block's weight
(B) The normal force is less than the block's weight
(C) The normal force is greater than the block's weight
(D) The normal force is equal to the buoyant force on the block
(E) The normal force is greater than the buoyant force on the block

- 1064 A ball rolls horizontally with speed v off of a table a height h above the ground. Just before the ball hits the ground, what is its speed?

(A) $\sqrt{2gh}$
(B) $v\sqrt{2gh}$
(C) $\sqrt{v^2 + 2gh}$
(D) v
(E) $v + \sqrt{2gh}$

1065 Given that aluminium has a thermal conductivity which is 3 times that of iron, which one of the following statements is correct?

[Assume all rods mentioned below are uniform and perfectly thermally insulated except for the ends of the rods.]

- A** The rate of heat flow through an aluminium rod is the same as that through an iron rod if the length of the aluminium rod is 3 times that of the iron rod of the same diameter and with the same temperature difference between its ends.
- B** The rate of heat flow through an aluminium rod is the same as that through an iron rod if the diameter of the iron rod is 3 times that of the aluminium rod of the same length and with the same temperature difference between its ends.
- C** The rate of flow of heat through an iron rod will be 3 times that through an aluminium rod of the same dimensions if the temperature difference between their ends is the same.
- D** The rate of heat flow through an aluminium rod is the same as that through an iron rod if the temperature difference between the ends of the aluminium rod is 3 times that of the iron rod of the same dimensions.
- E** The time taken for a particular quantity of heat to flow through an aluminium rod will be 3 times that for an iron rod of the same dimensions if the temperature difference between their ends is the same.

1066 What would be the velocity of a 10 kg object after a 10 N force acts over a distance of 10 m?

- A** 3.2 m/s
- B** 4.5 m/s
- C** 5.0 m/s
- D** 10 m/s
- E** 100 m/s

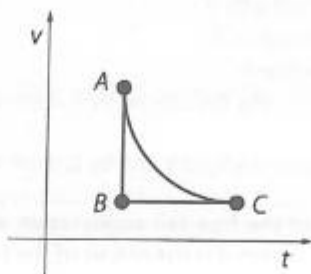
1067 The density of water near the ocean's surface is $\rho_0 = 1.025 \times 10^3 \text{ kg/m}^3$. At extreme depths, though, ocean water becomes slightly more dense. Let ρ represent the density of ocean water at the bottom of a trench of depth d . What can be said about the gauge pressure at this depth?

- A** The pressure is greater than $\rho_0 g d$, but less than $\rho g d$
- B** The pressure is greater than $\rho g d$
- C** The pressure is less than $\rho_0 g d$
- D** The pressure is greater than $\rho_0 g d$, but could be less than or greater than $\rho g d$
- E** The pressure is less than $\rho g d$, but could be less than or greater than $\rho_0 g d$

1068 Which of the following is NOT a statement or consequence of the second law of thermodynamics, the law dealing with entropy?

- A** The net work done by a gas cannot be greater than the sum of its loss of internal energy and the heat added to it
- B** Even an ideal heat engine cannot be 100% efficient
- C** A warm ball of putty cannot spontaneously cool off and rise
- D** A system cannot become more ordered unless some net work is done to obtain that order
- E** Heat does not flow naturally from a low to high temperature

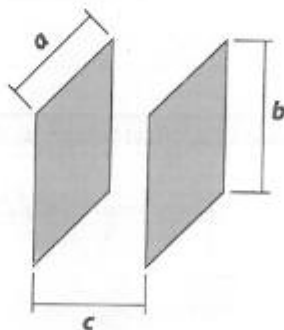
1069 The state of a gas in a cylinder is represented by the PV diagram shown below.



The gas can be taken through either the cycle $ABCA$, or the reverse cycle $ACBA$. Which of the following statements about the work done on or by the gas is correct?

- A In both cases, the same amount of net work is done by the gas
- B In both cases, the same amount of net work is done on the gas
- C In cycle $ABCA$ net work is done on the gas; in cycle $ACBA$ the same amount of net work is done by the gas
- D In cycle $ABCA$ net work is done by the gas; in cycle $ACBA$ the same amount of net work is done on the gas
- E In both cycles net work is done by the gas, but more net work is done by the gas in $ACBA$ than in $ABCA$

1070 The parallel plate capacitor below consists of identical rectangular plates of dimensions $a \times b$, separated by a distance c .



To cut the capacitance of this capacitor in half, which of these quantities should be doubled?

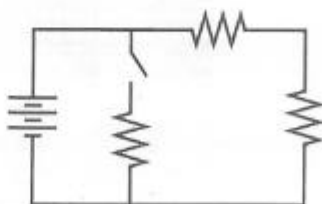
- A a
- B b
- C c
- D a and b
- E a , b and c

- 1071** Experimenter A uses a very small test charge q_0 , and experimenter B uses a test charge $2q_0$ to measure an electric field produced by stationary charges. A finds a field that is:
- A** greater than the field found by B
 - B** the same as the field found by B
 - C** less than the field found by B
 - D** either greater or less than the field found by B, depending on the accelerations of the test charges
 - E** either greater or less than the field found by B, depending on the masses of the test charges

- 1072** What is the magnitude of the free-fall acceleration at a point that is a distance $2R$ above the surface of the Earth, where R is the radius of the Earth?
- A** 4.8 m/s^2
 - B** 1.1 m/s^2
 - C** 3.3 m/s^2
 - D** 2.5 m/s^2
 - E** 6.5 m/s^2

- 1073** Students A and B run up the same flight of stairs.
- Both students run up the stairs at constant velocities.
 - Student A takes twice as long as student B to climb the stairs.
 - Student A weighs twice as much as student B.
- Which of the following are correct?
- I.** Student A develops more power than student B.
 - II.** Student B does more work than student A.
 - III.** The change in potential energy of student A is twice that of student B.
- A** I only
 - B** III only
 - C** I and II only
 - D** I and III only
 - E** I, II, and III

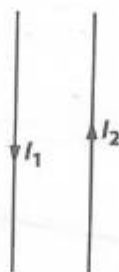
- 1074** Three resistors are connected to an ideal battery as shown in the diagram below.



The switch is initially open. When the switch is closed, what happens to the total voltage, current, and resistance in the circuit?

- A** Voltage increases; current increases; resistance increases
- B** Voltage does not change; current does not change; resistance does not change
- C** Voltage does not change; current decreases; resistance increases
- D** Voltage does not change; current increases; resistance decreases
- E** Voltage increases; current decreases; resistance decreases

1075 Two parallel wires carry currents in opposite directions, as shown below.



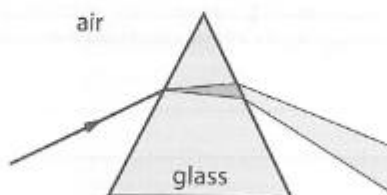
In what direction will the right-hand wire (the wire carrying current I_2) experience a force?

- A Left
- B Right
- C Into the page
- D Out of the page
- E The right-hand wire will experience no force

1076 What property of a light wave determines the color of the light?

- A Frequency
- B Wavelength
- C Velocity
- D Amplitude
- E The medium through which the light wave travels

1077 White light is incident on the triangular glass prism shown below.



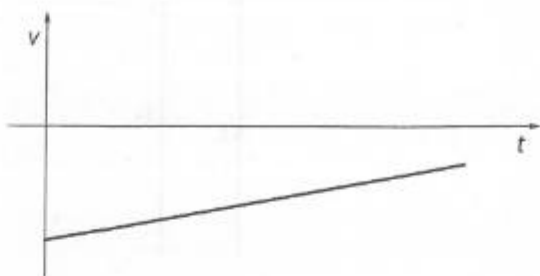
Why is it that blue and red light can be seen separately when the light exits the prism?

- A The blue light speeds up more inside the glass
- B Some of the red light reflects at each interface
- C The light changes its frequency within the glass
- D The blue light bends farther away from normal at the left-hand interface
- E The blue light bends farther away from normal at the right-hand interface

1078 In which of the following nuclear processes do both the atomic number Z as well as the atomic mass A remain unchanged by the process?

- A Uranium fission
- B Alpha decay
- C Beta+ decay
- D Beta- decay
- E Gamma decay

- 1079 The velocity-time graph below represents a car on a freeway. North is defined as the positive direction.



Which of the following describes the motion of the car?

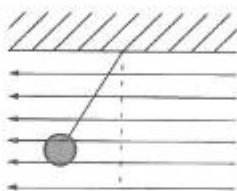
- A The car is traveling north and slowing down
 - B The car is traveling south and slowing down
 - C The car is traveling north and speeding up
 - D The car is traveling south and speeding up
 - E The car is traveling northeast and speeding up
- 1080 A ball of mass 160 g is travelling at 1.5 m/s and hits a second identical ball that is at rest. The second ball moves off at 1.0 m/s. The two balls are in contact for 1.0×10^{-2} s. What is the average force between the balls while they are in contact?
- A 16 N
 - B 16000 N
 - C 8000 N
 - D 8.0 N
 - E 0.016 N
- 1081 A race car travels 40 m/s around a banked (45° with the horizontal) circular (radius = 0.20 km) track. What is the magnitude of the resultant force on the 80-kg driver of this car?
- A 0.68 kN
 - B 0.64 kN
 - C 0.72 kN
 - D 0.76 kN
 - E 0.52 kN
- 1082 A car slows down on a highway. Its engine is providing a forward force of 1000 N; the force of friction is 3000 N. It takes 20 s for the car to come to rest. What is the car's change in momentum during these 20 s?
- A 10,000 kg · m/s
 - B 20,000 kg · m/s
 - C 30,000 kg · m/s
 - D 40,000 kg · m/s
 - E 60,000 kg · m/s
- 1083 An analysis of a sample of Asteroid Z34 shows that it contains 6% of substance A and 44% of substance B by mass. The half-life of substance A is 400 years and substance B is formed from the decay of substance A with no loss of mass and is not normally found on an asteroid. What is the approximate age of the asteroid?
- A 300 years
 - B 400 years
 - C 800 years
 - D 1000 years
 - E 1200 years

1084 Which of the optical instruments listed below can produce a virtual image of an object that is smaller than the object itself?

- I. concave mirror
- II. convex mirror
- III. concave lens
- IV. convex lens

- A I only
- B II only
- C III only
- D II and III only
- E I and IV only

1085 A uniform electric field points right to left. A small metal ball charged to $+2 \text{ mC}$ hangs at a 30° angle from a string of negligible mass, as shown below.



The tension in the string is measured to be 0.1 N . What is the magnitude of the electric field? ($\sin 30^\circ = 0.50$; $\cos 30^\circ = 0.87$; $\tan 30^\circ = 0.58$).

- A 25 N/C
- B 50 N/C
- C 2500 N/C
- D 5000 N/C
- E $10,000 \text{ N/C}$

1086 A solid metal ball and a hollow plastic ball of the same external radius are released from rest in a large vacuum chamber. When each has fallen 1 m , they both have the same:

- A inertia
- B speed
- C momentum
- D kinetic energy
- E change in potential energy

1087 A man can swim in still water at a maximum speed of 0.40 m/s . He swims at his maximum speed from one side of a river to the other. The river has straight sides and is 20 m wide. There is a current in the river of 0.30 m/s which pushes the man along the river as he swims.

What is the minimum time it takes the man to swim across the river, and how far along the river does the current move him?

[Assume the man travels at a constant speed.]

- A time = 62.5 s ; distance = 25 m
- B time = 62.5 s ; distance = 15 m
- C time = 40 s ; distance = 15 m
- D time = 50 s ; distance = 15 m
- E time = 50 s ; distance = 25 m

1088 A railroad car of mass m is moving at speed v when it collides with a second railroad car of mass M which is at rest. The two cars lock together instantaneously and move along the track. What is the speed of the cars immediately after the collision?

- A** $\frac{v}{2}$
- B** $\frac{mv}{M}$
- C** $\frac{Mv}{m}$
- D** $\frac{(m+M)v}{m}$
- E** $\frac{mv}{m+M}$

1089 In the equation:

$$x = ut + \frac{1}{2}at^2$$

the term $\frac{1}{2}at^2$ represents:

- A** an acceleration
- B** an impulse
- C** a speed
- D** a displacement
- E** there isn't enough information to say

1090 The equation below is the solution to a problem.

$$\frac{(2.00 \text{ kg})(8.00 \frac{\text{m}}{\text{s}})^2}{5.00 \text{ m}} = 6.00 \text{ N} - (2.00 \text{ kg})(9.80 \frac{\text{m}}{\text{s}^2})(\cos 0^\circ)$$

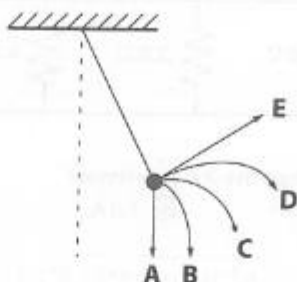
The best physical representation of this equation is:

- A** a sphere of 2.00 kg mass under a 6.00 N tension when at the bottom of a vertical circle
- B** a sphere of 2.00 kg mass under a 6.00 N tension when at the side of a vertical circle
- C** a sphere of 2.00 kg mass under a 6.00 N tension when at the top of a vertical circle
- D** a sphere of 2.00 kg mass at any point on a horizontal circle
- E** a 2.00 kg gecko running on the ceiling with a speed of 8.00 m/s

1091 The flow of liquid can be affected by various factors. Which of the following would increase the amount of flow of a fluid through a rigid pipe?

- A** Increasing the pressure in the pipe
- B** Increasing the diameter of the pipe
- C** Decreasing the viscosity of the fluid
- D** Options **A**, **B** and **C**
- E** Options **A** and **B** only

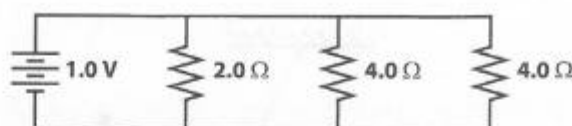
- 1092 A pendulum is swinging upward and is at its highest position, as shown below, when the string breaks.



Which of the paths shown best represents the one that the ball would take after the string breaks?

- A A
 - B B
 - C C
 - D D
 - E E
- 1093 1.0 nC is deposited on a solid metal sphere of diameter 0.30 m. What is the magnitude of the electric field at the center of the sphere?
- A zero
 - B 25 N/C
 - C 100 N/C
 - D 200 N/C
 - E 400 N/C
- 1094 A satellite orbits the moon in a circle of radius R . If the satellite must double its speed but maintain a circular orbit, what must the new radius of its orbit be?
- A $2R$
 - B $4R$
 - C $\frac{1}{2}R$
 - D $\frac{1}{4}R$
 - E R
- 1095 An ambulance van speeds toward you at 36 km/h. Its siren emits a sound at a constant 600 Hz frequency. You are standing still at the roadside. What is the frequency of the sound that you hear?
- A Less than 600 Hz
 - B 600 Hz
 - C More than 600 Hz
 - D 575 Hz
 - E Cannot be determined from the information given

- 1096 Three resistors are connected to a 1.0 V battery, as shown in the diagram below.



What is the current through the 2.0 Ω resistor?

- A** 0.25 A **B** 0.50 A **C** 1.0 A **D** 2.0 A **E** 4.0 A
- 1097 A yacht on a lake drops its anchor overboard. What happens to the water level in the lake?
- A** It rises very slightly
B It stays exactly the same
C It falls very slightly
D It's impossible to say
E Cannot be determined from the information given
- 1098 One end of a horizontal string is fixed to a wall. A transverse wave pulse is generated at the other end, moves toward the wall as shown above, and is reflected at the wall. Properties of the reflected pulse include which of the following?
- I.** It has a greater speed than that of the incident pulse.
II. It has a greater amplitude than that of the incident pulse.
III. It is on the opposite side of the string from the incident pulse.
- A** I only
B III only
C I and II only
D II and III only
E I, II, and III
- 1099 A free-body diagram includes vectors representing the individual forces acting on an object. Which of these quantities should NOT appear on a free-body diagram?
- A** Tension of a rope
B Mass times acceleration
C Kinetic friction
D Static friction
E Weight
- 1100 A person stands on a scale in an elevator. He notices that the scale reading is lower than his usual weight. Which of the following could possibly describe the motion of the elevator?
- A** It is moving down at constant speed
B It is moving down and slowing down
C It is moving up and slowing down
D It is moving up and speeding up
E It is moving up with constant speed

Soluzioni

Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta
1001	E	1002	A	1003	D	1004	D	1005	B	1006	B	1007	B	1008	D	1009	B	1010	C
1011	C	1012	E	1013	C	1014	C	1015	A	1016	C	1017	B	1018	B	1019	B	1020	B
1021	D	1022	C	1023	B	1024	C	1025	E	1026	B	1027	B	1028	C	1029	C	1030	D
1031	C	1032	C	1033	D	1034	E	1035	B	1036	B	1037	D	1038	B	1039	C	1040	C
1041	B	1042	B	1043	D	1044	B	1045	B	1046	B	1047	C	1048	C	1049	C	1050	E
1051	C	1052	D	1053	D	1054	D	1055	D	1056	C	1057	A	1058	C	1059	C	1060	D
1061	D	1062	D	1063	H	1064	C	1065	A	1066	B	1067	A	1068	A	1069	C	1070	C
1071	B	1072	B	1073	B	1074	D	1075	B	1076	A	1077	E	1078	E	1079	B	1080	A
1081	B	1082	D	1083	E	1084	D	1085	A	1086	B	1087	D	1088	E	1089	D	1090	A
1091	D	1092	A	1093	A	1094	D	1095	C	1096	B	1097	C	1098	B	1099	B	1100	C

Soluzioni

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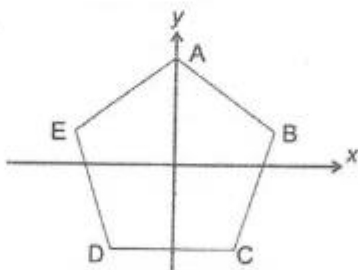
MATEMATICA

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- 1101 In a group of students, exactly $\frac{2}{5}$ are male and exactly $\frac{1}{3}$ study mathematics. The probability that a male student chosen at random from the group studies mathematics is p . Which of the following is the range of possible values of p ?

- (A) $0 \leq p \leq \frac{1}{3}$
- (B) $0 \leq p \leq \frac{5}{6}$
- (C) $\frac{1}{3} \leq p \leq \frac{2}{5}$
- (D) $\frac{1}{3} \leq p \leq 1$
- (E) $\frac{2}{5} \leq p \leq \frac{5}{6}$

- 1102 ABCDE is a regular pentagon. The transformation R is a rotation about the origin and maps A to B, B to C, C to D, etc. The transformation S is a reflection in the y-axis.



Which of the following sequences of transformations (performed in the order that they are listed) would NOT leave vertex D in the same position?

- (A) RRSRSR
- (B) RSRS
- (C) SR
- (D) RSRR
- (E) SRRSRS

- 1103 The line L has equation $y = 2x - 1$. Four of the following five points are the same distance from the line L . Which one is at a different distance?

- (A) (1, 3)
- (B) (4, 9)
- (C) (6, 9)
- (D) (5, 13)
- (E) (1, -1)

1104 Which of the following is equivalent to $\ln(x^2y) - 2\ln(xy) - 3\ln y$?

- A 0
- B $2\ln y$
- C $\ln x + 2\ln y$
- D $\ln x + \ln y$
- E $2\ln x + 2\ln y$

1105 What is the average (arithmetic mean) of 8 numbers if the average of 5 of the numbers is 24 and the sum of the remaining 3 numbers is 40?

- A 8
- B 16
- C 20
- D 30
- E 32

1106 What is the set of values of x for which $x^2 < 9$ and $2x + 3 \geq 5$?

- A $x > 3$
- B $x > -3$
- C $x \geq -1$
- D $1 \leq x < 3$
- E $x < -3$ or $x \geq 1$

1107 If two of the edges of a triangle are 5 inches and 8 inches, which of the following can be the length of the third edge?

- A 2 inches
- B 3 inches
- C 6 inches
- D 13 inches
- E 17 inches

1108 Consider two graphs:

Graph A: $y = 4x$

Graph B: $y = \frac{9}{x} + 16$

At what values of x do they meet?

- A $x = -4.5$ and $x = +0.5$
- B $x = -4.5$ and $x = +4.5$
- C $x = -0.5$ and $x = +0.5$
- D $x = -0.5$ and $x = +4.5$
- E They don't meet

1109 Which fraction is equal to 0.20%?

- A $\frac{1}{20}$
- B $\frac{1}{40}$
- C $\frac{1}{50}$
- D $\frac{1}{400}$
- E $\frac{1}{500}$

1110 A number is increased 50% and the resulting number is decreased 50%. The final number is what percentage of the original number?

- A 50%
- B 75%
- C 80%
- D 100%
- E 105%

1111 If $x^4 = 2y^2$ and $4y = 8$, what is the value of $x^4 + 2y$?

- A 8
- B 10
- C 12
- D 14
- E 16

- 1112 A box contains 11 tennis balls, labeled from 1 to 11. If 2 tennis balls are selected at random, what is the probability that both of them are labeled with odd numbers?
 (A) $5/7$ (B) $3/11$ (C) $4/11$ (D) $5/11$ (E) $6/11$

- 1113 If $y = x^2 + ax + b$, y is minimum when x is:
 (A) a/b (B) $-a/b$ (C) $-a/2$ (D) $-b/2$ (E) b/a

- 1114 If a , b and c are the sides of any triangle, which of the following inequalities is not true?
 (A) $ab > 0$
 (B) $a + b > c$
 (C) $a + \frac{c}{2} > b$
 (D) $b + c > a$
 (E) $(a + b) \cdot (b + c) > ac$

- 1115 For any real x , which of the following is equivalent to $x^6 + x^5 + x^4$?
 (A) $x^3(x^2 + x + 1)$
 (B) $x^4(x^2 + 1)$
 (C) $x^4(x^2 + x + 1)$
 (D) $x^4(x^3 + x + 1)$
 (E) $x^5(x^2 + x + 1)$

- 1116 If the length of a 3-degree arc of a circle is 2 inches, what is the circumference of the circle?
 (A) 100 inches
 (B) 120 inches
 (C) 200 inches
 (D) 240 inches
 (E) 360 inches

- 1117 In a sequence of 10 numbers which has 1 as the first number, each successive number is 1 more than the reciprocal of the number that immediately precedes it. What is the third term of this sequence?
 (A) 0.5 (B) 1 (C) 1.5 (D) 2 (E) 2.5

- 1118 A coin is tossed six times. What is the probability of getting exactly three heads?
 (A) $9/16$ (B) $1/2$ (C) $7/16$ (D) $5/16$ (E) $3/16$

- 1119 If x is an odd integer, which of the following is also an odd integer?
 (A) $2x + 6$ (B) $x^2 + x + 3$ (C) $x^2 + 2x + 1$ (D) $4x$ (E) $x^2 + 5$

- 1120 $6.334 \times 10^4 =$
 (A) 0.0006334 (B) 0.06334 (C) 6,334 (D) 63,340 (E) 633,400

1121 When Y is multiplied by $\frac{4}{7}$, it results in $\frac{6}{7}$. What is Y ?

- A $\frac{2}{7}$
- B $\frac{2}{3}$
- C $\frac{3}{2}$
- D $\frac{7}{2}$
- E $\frac{24}{7}$

1122 4 students go to the movies and seat on a row of 4 seats. How many different ways can the 4 students sit?

- A 12
- B 16
- C 18
- D 24
- E 26

1123 The variables x and y satisfy the following two equations:

$$x + 3y = 13$$

$$2x - y = 5$$

What is the value of $x + y$?

- A 6
- B 7
- C 8
- D 9
- E 10

1124 Two unbiased coins are tossed and an unbiased die (with faces numbered 1 to 6) is rolled. What is the probability that this results in two heads and a number less than 5?

- A $\frac{1}{12}$
- B $\frac{1}{6}$
- C $\frac{5}{24}$
- D $\frac{1}{3}$
- E $\frac{2}{3}$

1125 If x and y are integers, and $4x + 5y = 19$, which of the following could be the value of x ?

- A 1
- B 2
- C 3
- D 4
- E 5

1126 If the sum of n consecutive integers is 0, which of the following must be true?

- I) n is an even number
- II) n is an odd number

III) the arithmetic mean of the n integers is 0

- A I only
- B II only
- C III only
- D I and III
- E II and III

- 1127 Blue marbles, green marbles and red marbles are in a ratio of 5 to 7 to 8 in a box. If the total number of marbles is 240, how many green marbles are in the box?
 (A) 81 (B) 83 (C) 84 (D) 86 (E) 90

- 1128 If $x = mx + n$ and $y = mx - n$, then $y - x =$
 (A) $x - y$ (B) $-2n$ (C) $m + n$ (D) $2m$ (E) $-m$

- 1129 The numbers of products a store sold on 4 consecutive days were x , $x + 5$, $x + 3$ and $x + 12$. If the daily average of the products sold was 13, what is the value of x ?
 (A) 4 (B) 6 (C) 7 (D) 8 (E) 12

- 1130 If points $(1, 2)$ and $(x, 5)$ lie on the same line l in the rectangular plane, and the slope of l is 3, what is x ?
 (A) $x = 1$
 (B) $x = 2$
 (C) $x = 4$
 (D) $x = 5$
 (E) $x = 7$

- 1131 If 75% of a class answered the first question on a certain test correctly, 55% answered the second question on the test correctly, and 20% answered neither of the question correctly, what percent answered both correctly?
 (A) 10%
 (B) 20%
 (C) 30%
 (D) 50%
 (E) 65%

- 1132 Which one of the following is equivalent to:

$$\frac{3}{\sqrt{5} + \sqrt{2}}$$

- (A) $\frac{\sqrt{5} + \sqrt{2}}{2}$
 (B) $\sqrt{5} + \sqrt{2}$
 (C) $\sqrt{5} - \sqrt{2}$
 (D) $3\sqrt{5} + 3\sqrt{2}$
 (E) $3\sqrt{5} - 3\sqrt{2}$

- 1133 Which of the following is equal to 5.93×10^{-2} ?

- (A) 0.0593
 (B) 0.00593
 (C) 593
 (D) 5930
 (E) 59300

1134 Given that x is a real number, what is the complete solution of $10x - 3x^2 < 7$?

- A** $x > \frac{10}{3}$
- B** $-\frac{7}{3} < x < -1$
- C** $1 < x < \frac{7}{3}$
- D** $x < -\frac{7}{3}$ or $x > -1$
- E** $x < 1$ or $x > \frac{7}{3}$

1135 If m is the average of the first 10 positive multiples of 5 and M is the median of the first 10 positive multiples of 5, what is the value of $M - m$?

- A** 0
- B** 5
- C** 10
- D** 15
- E** 25

1136 If a , b and c are consecutive integers, $a < b < c$, and $a + b + c = 96$, what is the value of b ?

- A** $b = 30$
- B** $b = 31$
- C** $b = 32$
- D** $b = 33$
- E** $b = 34$

1137 Given that $2\log_{10}(x) - 3 = \log_{10}(y)$ express y in terms of x .

- A** $y = \frac{2x}{1000}$
- B** $y = \frac{2x}{3}$
- C** $y = \frac{x^2}{3}$
- D** $y = \frac{x^2}{1000}$
- E** $y = x^2 - 3$

1138 If the sum of two positive integers is 24 and the difference of their squares is 48, what is the product of the two integers?

- A** 108
- B** 119
- C** 128
- D** 135
- E** 143

- 1139 The line segment PQ has an endpoint P(2; 8). The midpoint M of PQ is on the y-axis and the other endpoint Q is on the x-axis. Find the coordinates of M and Q.
- A M(0; 0) and Q(-8; 0)
 B M(0; 3) and Q(-4; 0)
 C M(0; 4) and Q(-2; 0)
 D M(0; 6) and Q(-5; 0)
 E M(1; 4) and Q(0; 0)
- 1140 The average height of 3 members of a five-a-side football team is 175 cm. What does the average height in centimetres of the other 2 players have to be if the average height of the entire team equals 178 cm?
- A 178 cm
 B 181 cm
 C 182.5 cm
 D 183.5 cm
 E 184 cm
- 1141 What is the set of values of x for which $12 - x^2 > 8$ and $3 - 2x \geq 5$?
- A $1 \leq x < 2$
 B $-2 < x \leq -1$
 C $-2 < x \leq 1$
 D $2 < x$
 E $x \leq -1$
- 1142 95 percent of the revenues of a company came from the sale of computers. The remaining revenues, totalling £ 450,000, came from selling DVDs. What was the total of the company's revenues?
- A £ 1,500,000
 B £ 2,500,000
 C £ 4,500,000
 D £ 9,000,000
 E £ 10,000,000
- 1143 What is the average (arithmetic mean) of the numbers 8, 12, 13, 14, 15 and 16?
- A 11 B 12 C 13 D 14 E 15
- 1144 A recent study showed that an increase in body weight by 10 kilograms resulted in a 0.15% increase in heart disease. What fraction is equal to 0.15%?
- A $\frac{3}{2000}$ B $\frac{2}{750}$ C $\frac{7}{4000}$ D $\frac{5}{3462}$ E $\frac{1}{500}$
- 1145 In a right-angled triangle ABC, the length of side AB is 20 cm and the tangent of angle A is $\frac{1}{2}$. The hypotenuse is the side AC. What is the length of the perpendicular from the hypotenuse to point B?
- A $8\sqrt{5}$ cm B $10\sqrt{2}$ cm C $2\sqrt{5}$ cm D $5\sqrt{2}$ cm E $4\sqrt{5}$ cm
- 1146 If x and y are inversely proportional and $x = 10$ and $y = 5$, what is y when x is 25?
- A 1 B 2 C 5 D 10 E 20

1147 What is the median of the following fractions?

- A $\frac{17}{36}$ B $\frac{1}{2}$ C $\frac{2}{8}$ D $\frac{13}{18}$ E $\frac{9}{27}$

1148 In which interval does the following sum fall: $\frac{7}{8} + \frac{1}{10}$?

- A Between $\frac{1}{2}$ and $\frac{3}{4}$
 B Between $\frac{3}{4}$ and $\frac{9}{10}$
 C Between $\frac{9}{10}$ and 1
 D Between 1 and $\frac{11}{10}$
 E Between $\frac{11}{10}$ and 1.5

1149 The supply of coffee beans is given by the following formula:

$$S = 3X^2 + X - 10$$

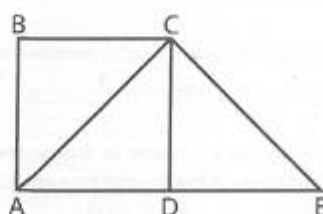
The demand for coffee beans is given by the following formula:

$$D = 2X^2 + 4X$$

where X is the price of coffee beans in pounds. At which of the following values of X (expressed in pounds) will the supply of coffee beans equal demand?

- A 2 B 3 C 4 D 5 E 6

1150 In the figure below, the square ABCD and the triangular region ACE each have area 36.



What is the perimeter of the triangle ACD?

- A 12 B $12 + 6\sqrt{2}$ C 18 D $18 + \sqrt{72}$ E 24

1151 If the cost of one apple is $X/2$ and the cost of a pear is $Y/3$, what is the average (arithmetic mean) cost for A units of apples and B units of pears?

- A $\frac{3A + 2B}{12}$ B $\frac{3AX + 2BY}{2}$ C $\frac{3AX + 2BY}{6}$ D $\frac{3AX + 2BY}{A + B}$ E $\frac{3AX + 2BY}{6(A + B)}$

- 1152 A rigid ladder is leaning against a wall that is perpendicular to level ground. The top of the ladder touches the wall at 4 metres above the floor. The bottom of the ladder is 3 metres from the base of the wall. If the top of the ladder slips down 1 metre, how many metres will the bottom of the ladder slip along the ground?

A 1 B 2 C $4\sqrt{3} - 3$ D 4 E 5

- 1153 For which of the following equations is it true that the value of the expression is the same when $X = -456$ as it is when $X = 456$?

- 1) $50 - 2X$
2) $50 - 2X^2$
3) $(50 - 2X^3)^2$

A 1
B 2
C 3
D 2 and 3
E 1, 2 and 3

- 1154 If $(X - 3)(X - 1) = 0$ which of the following must be true?

- I. $X = 3$ and $Y = 1$
II. If $X \neq 3$ then $Y = 1$
III. If $X = 3$ then $Y \neq 1$

A I only
B II only
C III only
D I, II and III
E None of the above

- 1155 An author has a monthly salary determined by the formula:

$$\text{Salary} = £ 2500 + X/10$$

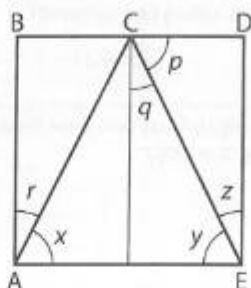
where X is the retail value of the books sold, expressed in pounds per month. In July his salary was £ 4,000 and in August, it was 20% greater. What was the value of the books sold in August?

A £ 2,900
B £ 2,980
C £ 10,000
D £ 15,000
E £ 23,000

- 1156 £ 5,000 pounds were deposited into a savings account. The annual interest rate is 7% compounded quarterly. What is the value of the savings at the end of 3 years?

A $5,000 \times (1.0175)^{12}$
B $5,000 \times (1.07)^3$
C $5,000 \times (1.07)^{21}$
D $5,000 \times (1.07)^{12}$
E $5,000 \times (1.0233)^3$

- 1157 In the figure below, ABDE is a square and the length BC is equivalent to CD. Which of the following statements is not true?



- A $AC = CE$
 B Angle $r = \text{angle } z$
 C Angle $x = \text{angle } y$
 D Angle $p = \text{angle } z$
 E The areas of triangles ABC and CDE are equal
- 1158 Consider a graph representing $y = (x - 5)^3 + 2(x + 2)^2 + (x - 3) + 7$ and a point P(7; 176). Unit = centimetre. Point P is:
- A on the curve
 B less than 10 cm below the curve
 C more than 10 cm below the curve
 D less than 10 cm above the curve
 E more than 10 cm above the curve
- 1159 The product of 2 positive integers A and B is four times the sum of A and B. If $A = 2$, what is the value of B?
- A 2 B 4 C 6 D 8 E 12
- 1160 Which one of the following is the composite function $f \cdot g(x)$ where:

$$f(x) = 2x - 1$$

$$g(x) = 6 - x$$

- A $f \cdot g(x) = 11 - 2x$
 B $f \cdot g(x) = 11 - x$
 C $f \cdot g(x) = 13 - 2x$
 D $f \cdot g(x) = 7 - 2x$
 E $f \cdot g(x) = 5 - 2x$
- 1161 What is the equation of the straight line passing through (4, 1) which is parallel to the line given by $3x + 2y = 12$?
- A $3y = 14 - 2x$
 B $2y = 11 - 3x$
 C $2y = 14 - 3x$
 D $3y = 2x - 5$
 E $2y = 3x - 10$

1162 Calculate the following equation: $\frac{8^4 - 1}{3 \cdot (8^2 + 1)}$.

(A) 11

(B) 21

(C) 25

(D) 35

(E) 43

1163 Which of the following sums is the greatest?

I. $\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}} + \frac{1}{\sqrt{4}} + \frac{1}{\sqrt{5}}$

II. $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}$

III. $\frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2}$

IV. $\frac{1}{2^2} + \frac{1}{2^3} + \frac{1}{2^4} + \frac{1}{2^5}$

V. $\frac{1}{3^2} + \frac{1}{3^3} + \frac{1}{3^4} + \frac{1}{3^5}$

(A) I

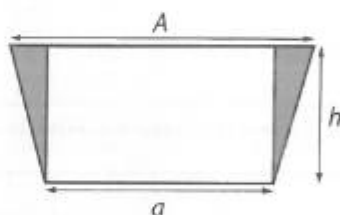
(B) II

(C) III

(D) IV

(E) V

1164 Consider the following diagram:



What is the combined area of the two grey triangles?

(A) $2Ah$

(B) $\frac{ah}{2}$

(C) $\frac{A+a}{2h}$

(D) $\frac{h(A-a)}{2}$

(E) $\frac{h(A+a)}{2}$

1165 What is the median of the following numbers?

0.5 $\frac{3}{8}$ 0.75 $\frac{17}{24}$ 0.25

(A) 0.5

(B) $\frac{3}{8}$

(C) 0.75

(D) $\frac{17}{24}$

(E) 0.25

1166 If $x = 0.02$ and $n = 10,000$, then calculate the following equation:

$$\sqrt{\frac{x(0.1-x)}{n}}$$

- (A) 0.4 (B) 0.04 (C) 0.004 (D) 0.0004 (E) 0.00004

1167 Calculate the following equation: $\sqrt{5} - \sqrt{125}$.

- (A) $-\sqrt{120}$ (B) $-2\sqrt{5}$ (C) $-4\sqrt{5}$ (D) -2.5 (E) -0.00004

1168 What is the area of a rectangle with length $3X + 1$ and width $X - 3$?

- (A) $X^2 - 8X - 3$
(B) $2X^2 + 8X - 3$
(C) $3X^2 + 8X - 3$
(D) $3X^2 - 8X - 3$
(E) $3X^2 - 8X + 3$

1169 If $167^2 = 27,889$ what does 167×501 equal to?

- (A) 167×4
(B) $27,889 \times 3$
(C) $27,889 \times 4$
(D) $(27,889)^2$
(E) $(27,889)^3$

1170 The sides of an equilateral triangle measure X . What is the formula for the triangle's area?

- (A) $\frac{X^2}{2}$ (B) $\sqrt{2}X^2$ (C) $\frac{\sqrt{2}}{3}X^2$ (D) $\frac{\sqrt{3}}{4}X^2$ (E) $\sqrt{\frac{4}{3}}X^2$

1171 If $y(x - 1) = z$ then $x =$

- (A) $y - z$ (B) $1 - zy$ (C) $y(z - 1)$ (D) $z(y - 1)$ (E) $\frac{z}{y} + 1$

1172 If the average (arithmetic mean) of A and B is 60 and the average (arithmetic mean) of B and C is 80, what is the value of $C - A$?

- (A) 10 (B) 20 (C) 30 (D) 40 (E) 50

1173 What will it cost to tile a kitchen floor that is 12 feet wide by 20 feet long if the tile cost \$8.91 per square yard?

- (A) \$224.51 (B) \$237.60 (C) \$246.55 (D) \$271.38 (E) \$282.32

1174 You are lying 120 ft away from a tree that is 50 feet tall. You look up at the top of the tree. Approximately how far is your hear from the top of the tree in a straight line?

- (A) 75 feet (B) 120 feet (C) 130 feet (D) 145 feet (E) 170 feet

1175 If $3x = 6x - 15$, then $x + 8 =$

- (A) 5 (B) 10 (C) 11 (D) 12 (E) 13

1176 What is $1/9$ of 9?

- (A) $1/9$ (B) 0 (C) 1 (D) 2 (E) 3

1177 Of the following fractions, which is less than $2/3$?

- (A) $7/8$ (B) $5/6$ (C) $3/4$ (D) $3/5$ (E) $5/7$

1178 By how much does 0.756 exceed $3/4$?

- (A) $6/25$ (B) $3/125$ (C) $1/250$ (D) $3/250$ (E) $3/500$

1179 Which of the following is equivalent to $114/2000$?

(A) $\frac{5}{10} + \frac{7}{10}$

(B) $\frac{5}{10} + \frac{7}{100}$

(C) $\frac{5}{100} + \frac{7}{100}$

(D) $\frac{5}{100} + \frac{7}{1000}$

(E) $\frac{5}{1000} + \frac{7}{1000}$

1180 The operation @ is defined by the following equation:

$$x@y = \frac{x-y}{2x-y} \text{ where } 2x \neq y$$

Which of the following equals 0?

- (A) $-2@2$ (B) $2@-2$ (C) $2@2$ (D) $2@1$ (E) $3@2$

1181 If $d = \frac{a+b}{1+\frac{ab}{c^2}}$, $a = \frac{c}{2}$, $b = \frac{3c}{4}$ what is the value of d in terms of c ?

(A) $\frac{5c}{2}$

(B) $\frac{5}{2c}$

(C) $\frac{10c}{11}$

(D) $\frac{10}{11c}$

(E) $\frac{10c}{3}$

1182 Which of the following values is NOT equal to $34 \times (58 + 9)$?

- A 34×67
- B $34 \times 58 + 34 \times 9$
- C $(9 + 58) \times 34$
- D $58 \times (34 + 9)$
- E $1,972 + 306$

1183 For the month of June, the average (arithmetic mean) of the daily high temperatures recorded with a thermometer was X degrees. If the average for the first 13 days of the month was $X - 10$ degrees, what was the average, in degrees, for the remaining 17 days of the month?

- A $X + 10$
- B $\frac{17X + 10}{17}$
- C $\frac{17X + 130}{2}$
- D $\frac{17X + 130}{17}$
- E $\frac{130X + 17}{X}$

1184 If a sequence of 8 consecutive odd integers with increasing values has 9 as its 7th term, what is the sum of the terms of the sequence?

- A 22
- B 32
- C 36
- D 40
- E 44

1185 Which of the following fractions is equal to $5/6$?

- A $20/30$
- B $15/24$
- C $25/30$
- D $40/54$
- E $2/7$

1186 If, in the formula $X = \frac{1}{(2r)^3}$, r is halved, by which factor is X multiplied?

- A 1
- B 8
- C 64
- D $1/8$
- E $1/16$

1187 If $(-3; C)$ is a point on the graph of $y = 3x^2 - 2x + 3$, then C is:

- A 12
- B 15
- C 24
- D 30
- E 36

1188 Two angles in a triangle equal 120° . What is the measure of the third angle?

- A 60°
- B 70°
- C 80°
- D 90°
- E 120°

1189 Calculate the following equation: $(\sqrt{7} - 2)(\sqrt{7} + 2)$.

- A $\sqrt{7} - 4$
- B $2\sqrt{7}$
- C 3
- D 5
- E 45

1190 If $3x + 5x = -8$, then $x + 1 =$

- A -2
- B -1
- C 0
- D 1
- E 2

1191 Two angles of a triangle measure 15° and 85° . What is the measure for the third angle?

- A 50°
- B 55°
- C 60°
- D 80°
- E 90°

1192 Which of the following is the closest estimate to $\frac{61.25 \times (0.998)^2}{\sqrt{404}}$?

- A 1
- B 2
- C 3
- D 4
- E 5

1193 If the average (arithmetic mean) of X , Y , and Z is 50, what is the arithmetic mean of $3X - 10$, $3Y + 20$, and $3Z + 50$?

- A 70
- B 120
- C 130
- D 150
- E 170

1194 A hockey team won 6 games and lost 8. What is the ratio of wins to number of games?

- A $6/8$
- B $8/6$
- C $3/7$
- D $8/14$
- E $6/7$

1195 If $x > 5000$ then what is the closest value of $x / (2x + 1)$?

- A $1/2$
- B $1/3$
- C $1/6$
- D $3/2$
- E $10/21$

1196 Which of the following is the closest estimate for $\frac{50.2 \times 0.49}{199.8}$?

- A $\frac{1}{4}$
- B $\frac{1}{8}$
- C $\frac{1}{10}$
- D $\frac{5}{4}$
- E $\frac{25}{2}$

1197 A disk has an area equal to 25π . What is its radius?

- A 5
- B 6
- C $2\sqrt{3}$
- D $4\sqrt{2}$
- E $5\sqrt{2}$

1198 A line segment AB has an endpoint A (1; 2) and the midpoint is M (4; 3). What are the coordinates of the endpoint B?

- A (1; 3)
- B (3; 1)
- C (4; 7)
- D (7; 4)
- E (5; 5)

1199 A man starts at point A and walks 30 m east, and then another 40 m north to point B. What is the distance between A and B when measured as a straight line?

- A 20 m
- B 35 m
- C 50 m
- D 120 m
- E 2500 m

1200 A mouse fed with a high fat diet (HFD) feed weighs 450 grams, and a mouse fed control feed pellets weighs 250 grams. What percentage of the weight of the control mice does the weight of the HFD mice represent?

- A 55%
- B 80%
- C 155%
- D 180%
- E 230%

Soluzioni

Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta	Quesito	Risposta
1101	B	1102	A	1103	D	1104	B	1105	C	1106	D	1107	C	1108	D	1109	E
1111	C	1112	B	1113	C	1114	C	1115	C	1116	D	1117	C	1118	D	1119	B
1121	C	1122	D	1123	B	1124	B	1125	A	1126	E	1127	C	1128	B	1129	D
1131	D	1132	C	1133	A	1134	E	1135	A	1136	C	1137	D	1138	E	1139	C
1141	B	1142	D	1143	C	1144	A	1145	E	1146	B	1147	A	1148	C	1149	D
1151	E	1152	A	1153	B	1154	B	1155	E	1156	D	1157	D	1158	B	1159	C
1161	C	1162	B	1163	A	1164	D	1165	A	1166	D	1167	G	1168	D	1169	B
1171	E	1172	D	1173	B	1174	C	1175	E	1176	C	1177	D	1178	E	1179	D
1181	C	1182	D	1183	D	1184	B	1185	C	1186	B	1187	F	1188	A	1189	C
1191	D	1192	C	1193	E	1194	C	1195	A	1196	B	1197	A	1198	D	1199	C

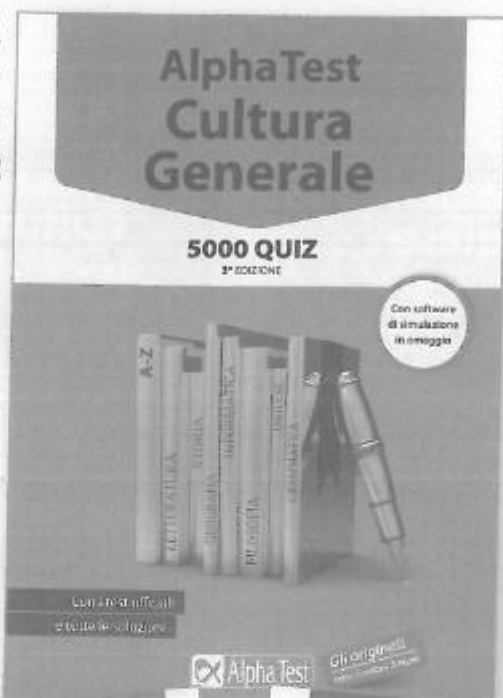
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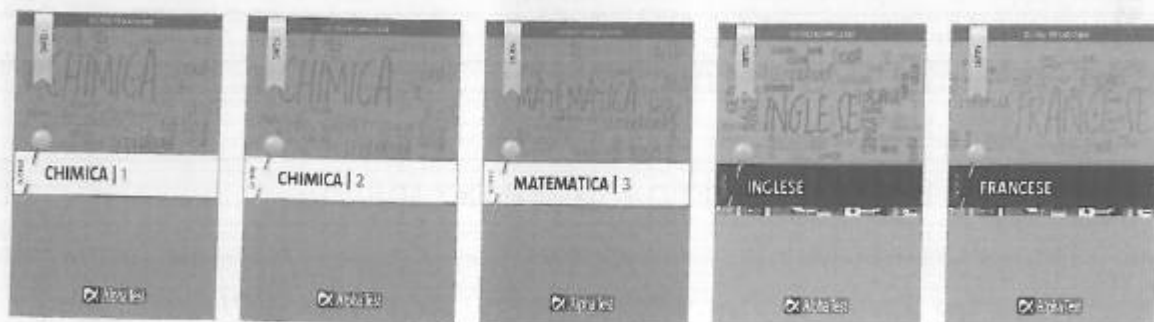
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