# Question of the Day

Book 6

Test Funda
complete mba test prep

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# SOLUTIONS

# PREFACE

*For the past couple of years, CAT and other MBA entrance exams have shown a trend towards questions testing a student's ability to apply Mathematical Principles and Analytical Reasoning to solve problems. The unpredictable nature of CAT has ensured that most students are never fully prepared to ace the exam. This is because students limit their preparation to just the learning and practice of core concepts of Mathematics, Verbal Ability and Data Interpretation & Logical Reasoning.*

*This book is a compilation of the questions with a difficulty level typically on par with CAT. Every single question is original and unique, created by our dedicated team of subject matter experts. The questions are designed to give our readers greater exposure to the types of questions that appear in CAT. The detailed solutions in this book may also provide alternate strategies and shortcuts to solve problems. This book will give students that extra edge and confidence needed to be ready for any surprise that CAT might throw their way.*

*This book is the 6$^{th}$ in a series of books on the 'Question of the Day' featured on the TestFunda site. We are sure that our readers will benefit greatly from these books.*

## Question of the Day #01: (22-Feb-09)

There are 10 balls of the same size but different colors. These balls have to be arranged in a row such that the red ball is always to the left of the green ball. The red ball and green ball need not always be next to each other. In how many ways can the balls be arranged?

**OPTIONS**

1) $9!$
2) $\frac{9!}{5!}$
3) $\frac{8! \times 5!}{2!}$
4) $5 \times 9!$
5) None of these

## Question of the Day #02: (23-Feb-09)

The question consists of a certain number of sentences. Some sentences are grammatically incorrect or inappropriate. Select the option that indicates the grammatically incorrect and inappropriate sentence(s).

A. The harbour lies below me, with, on the far side, one long granite wall stretching out into the sea, with a curve outwards at the end of it, in the middle of which is a lighthouse.

B. A heavy seawall runs along outside of it.

C. On the near side, seawall makes an elbow crooked inversely, and its end too has a lighthouse.

D. Among the two piers there is a narrow opening into the harbour, which then suddenly widens.

**OPTIONS**

1) A and B
2) A, B and C
3) C and D
4) B only
5) B and C

## Question of the Day #03: (24-Feb-09)

S is a sequence whose $n^{th}$ term is given by

$$S_n = \left[1 - \frac{2}{n+1}\right]$$

what is the least number of consecutive terms of S, starting from $S_2$, need to be multiplied together to get a product less than 0.01?

**OPTIONS**

1) 12
2) 13
3) 14
4) 15
5) None of these

## Question of the Day #04: (25-Feb-09)

The question consists of a certain number of sentences, parts of which have been underlined. Some of the underlined parts of these sentences are grammatically incorrect or inappropriate. Select the option that indicates the grammatically incorrect and inappropriate sentence(s).

(1) Worker bees weren't helping just any old bunch of bees; they were protecting their hive. (2) And their hive contained special individuals: blood relatives. So even though (3) the little worker bees may have been giving their lives, by doing so they were potentially saving hundreds of blood relatives. In modern parlance, (4) we'd say that the worker bees were helping blood kin, because blood kin are genetically related. By helping your blood relatives, (5) you are indirectly promoting the reproduction of copies of your own genes - copies that just happen to reside inside your kin.

**OPTIONS**

1) 2, 3 and 4
2) 2, 4 and 5
3) 2 only
4) 3 only
5) All are correct

## Question of the Day #05: (26-Feb-09)

If $k \in I$, then the number of possible values of $k$, which satisfy the equation $1! + 2! + 3! + \ldots + (x - 1)! + x! = k^2$ are

**OPTIONS**

1) 0
2) 4
3) 13
4) More than 40
5) None of these

## Question of the Day #06: (27-Feb-09)

The question consists of a certain number of sentences. Some sentences are grammatically incorrect or inappropriate. Select the option that indicates the grammatically incorrect and inappropriate sentence(s).

A. Tides always go in couples; if there is a tide on one side of a globe there will be a corresponding tide on the other side.

B. The cause is to be found in the law that the force of gravitation varies inversely as the square of the distance; the attraction on the nearest surface of the body exercised by another body is greater than on its centre, and greater yet than on its opposite surface.

C. If two great globes attract each other, each tends to draw the other out into an ellipsoidal figure; they must be more rigid than steal to resist this - and even then they cannot altogether resist.

D. If they are liquid or gaseous they will yield readily to the force of distortion, the amount of which will depend upon their distance apart, for the nearer they are the greater becomes the tidal strain.

E. If they are encrusted without and liquid or gaseous in the interior, the internal mass will strive to assume the figure demanded by the tidal force, and will, if it can, burst the restraining envelope.

**OPTIONS**

1) A B and D
2) B and D
3) C only
4) A only
5) C and E

## Question of the Day #07: (28-Feb-09)

A sphere is cut into 2 equal pieces. Now out of 2 equal pieces, 1 piece is again cut into a symmetrical fashion such that 2 equal pieces are formed. Now once again, 1 piece from newly formed pieces is taken and cut into a symmetrical fashion such that two equal pieces are formed. Then what will be the ratio of surface area of the biggest piece to the smallest piece?

**OPTIONS**

1) 3.6
2) 3.2
3) 1.8
4) 2.4
5) None of these

## Question of the Day #08: (01-Mar-09)

The question consists of a certain number of sentences. Some sentences are grammatically incorrect or inappropriate. Select the option that indicates the grammatically incorrect and inappropriate sentence(s).

A. He insisted on carrying my traps along the passage, and then up a great winding stair, and along another great passage, on whose stone floor our steps rang heavily.

B. At the end of this he threw open a heavy door, and I rejoiced to see within a well-lit room, in which a table was spread for supper, and on whose mighty hearth a great fire of logs, freshly replenished, flame and flared.

C. Within, stood a tall old man, clean shaven save for a long white moustache, and clad in black from head to foot, without a single speck of colour about him anywhere.

D. He held in his hand an antique silver lamp, in which the flame burned without a chimney or globe of any kind, throwing long quivering shadows as it flickered in the drought of the open door.

E. The old man motioned me in with his right hand with a courtly gesture, speaking in excellent English, but with a strange intonation.

**OPTIONS**

1) D, E and A
2) B and C
3) A and E
4) B and D
5) C only

## Question of the Day #09: (02-Mar-09)

If 'P' be the set of prime numbers less than 100, then what will be the maximum common difference of an A.P. formed by 4 numbers selected from the set P?

**OPTIONS**

1) 40
2) 18
3) 10
4) 31
5) None of these

## Question of the Day #10: (03-Mar-09)

Fill in the blanks in the passage with the most appropriate set of words from the options for each blank.

Emotion can have a powerful impact on memory. Numerous studies have shown that the most _____ autobiographical memories tend to be of emotional events, which are likely to be recalled more often and with more clarity and detail than _____ events. The activity of emotionally enhanced memory retention can be linked to human evolution; during early development, _____ behavior to environmental events would have progressed as a process of trial and error. Survival depended on behavioral patterns that were _____ through life and death situations.

**OPTIONS**

1) intense, extraordinary, receptive, repeated
2) prosaic, mundane, receptive, reinforced
3) vivid, neutral, responsive, reinforced
4) Prosaic, mundane, sluggish, repeated.
5) banal, neutral, responsive, repeated

## Question of the Day #11: (04-Mar-09)

Five positive distinct integers *a, b, c, d* and *e* are selected such that $a < c < e < b < d$ and following information is given

(i) $\left|\frac{(e-15)}{10}\right| \leq \frac{2}{5}$

(ii) $a = \frac{9}{x} + x$

(iii) $d = 25 - |7 + y|$

(iv) $x > 0$

What is the range of the sum *p* of these numbers?

**OPTIONS**

1) (38, 105)
2) (38, 105]
3) (49, 103)
4) (48, 104)
5) None of these

## Question of the Day #12: (05-Mar-09)

Fill in the blanks in the passage with the most appropriate set of words from the options for each blank.

The military law of England in early times existed, like the forces to which it applied, in a period of war only. Troops were raised for a particular service, and were _____ upon the _____ of hostilities. The crown made laws known as Articles of War, for the government and discipline of the troops while thus embodied and serving. Except for the punishment of desertion, which was made a felony by _____ in the reign of Henry VI, these ordinances or Articles of War remained almost the sole authority for the enforcement of discipline until 1689, when the first Mutiny Act was passed and the military forces of the crown were brought under the direct control of parliament. Even the Parliamentary forces in the time of Charles I and Oliver Cromwell were governed, not by an act of the legislature, but by articles of war similar to those issued by the king and authorized by an ordinance of the Lords and Commons, exercising in that respect the sovereign _____

**OPTIONS**

1) dissolved, termination, law, ideology.
2) dissolved, onset, statute, doctrine.
3) activated, onset, law, doctrine.
4) disbanded, cessation, statute, prerogative.
5) activated, termination, law, ideology.

## Question of the Day #13: (06-Mar-09)

Rakesh climbs a mountain at a constant speed and climbs down at a speed which is four fifth the speed with which he climbed the mountain. Another mountaineer, Rajesh starts climbing the same mountain when Rakesh has reached half way up the mountain. Rajesh continues his downwards journey with the same speed with which he climbed the mountain. If both Rakesh and Rajesh used the same path to travel up and down the mountain and return to the starting point simultaneously, then at what fraction of the height of the mountain they both meet for the first time?

**OPTIONS**

1) $\frac{4}{5}$
2) $\frac{5}{6}$
3) $\frac{6}{7}$
4) $\frac{7}{8}$
5) None of these

## Question of the Day #14: (07-Mar-09)

Fill in the blanks in the passage with the most appropriate set of words from the options for each blank.
At the ecosystem and biosphere levels, there is a continual recycling of all these elements, which alternate between the mineral and organic states.While there is a slight _____ of geothermal energy, the bulk of the functioning of the ecosystem is based on the input of solar energy. Plants and photosynthetic microorganisms convert light into chemical energy by the process of photosynthesis, which creates glucose and releases free oxygen. Glucose thus becomes the secondary energy source which _____ the ecosystem. Some of this glucose is used directly by other organisms for energy. Cellular respiration is the process by which organisms break the glucose back down into its constituents, water and carbon dioxide, thus _____ the stored energy the sun had given to the plants. The proportion of photosynthetic activity of plants and other photosynthesizers to the respiration of other organisms determines the specific composition of the Earth's atmosphere, particularly its oxygen level. Global air currents mix the atmosphere and maintain nearly the same _____ of elements in areas of intense biological activity and areas of slight biological activity.

**OPTIONS**

1) increase,regulates, resurrecting, quantity
2) decrease, regulates, resurrecting, balance
3) input,drives, regaining, balance
4) increase, forms, resurrecting, residue
5) input, forms, regaining, quantity

## Question of the Day #15: (08-Mar-09)

$f(x) = x^2 - 6x - 1$, if $3 \le x \le 4$

$f(x) = -1 - x^2$, if $0 \le x < 3$

Then what will be the minimum value of the function $f(x)$ as defined above?

**OPTIONS**

1) 0
2) 3
3) −10
4) −2
5) None of these

## Question of the Day #16: (09-Mar-09)

Fill in the blanks in the passage with the most appropriate set of words from the options for each blank.

It is not my intention to be illiberal; these latter expressions have been forced from me by **-** _____. Your Lordship has given a proof that even religious controversy may be conducted without asperity; I hope I shall profit by your example. At the same time, with a spirit which you may not _____ - for it is a republican spirit - I shall not _____ myself from any truths, however severe, which I may think beneficial to the cause which I have undertaken to defend.

**OPTIONS**

1) torture, reject, forefend
2) persecution, apprehend, avert
3) indignation, approve, preclude
4) indirection, affirm, peruse

## Question of the Day #17: (10-Mar-09)

Akbar assigned the first 11 natural numbers as $a$, $b$, $c$, $d$, $e$, … , $k$ not necessarily in that order. After some days, he forgot which number corresponds to which letter, but he knew that $a + b + c + d + e + g + h + i + k = 3f + 5j$. Which of the following number cannot be the value of '$j$'?

**OPTIONS**

1) 9
2) 5
3) 7
4) 3
5) None of these

## Question of the Day #18: (11-Mar-09)

Fill in the blanks in the passage with the most appropriate set of words from the options for each blank.

Let it therefore be noted that it is the 'Recollections' that are censured. Elsewhere De Quincey certainly shows a _____ recognition of Wordsworth's great qualities, and that before they had been fully admitted; but everywhere there is an _____ of familiarity and a patronising self-consciousness that is irritating to any one who reverences great genius and high _____. It may be conceded that De Quincey, so far as he was capable, did reverence Wordsworth; but his exaggerations of awe and delays bear on the face of their unveracity.

**OPTIONS**

1) glimmering, impertinence, rectitude
2) complete, deference, iridescence
3) gracious, preponderance, veracity
4) didactic, elation, significance

## Question of the Day #19: (12-Mar-09)

An isosceles triangle APQ (AP = AQ) is inscribed in a square ABCD of side 10 cm such that P and Q are points on sides BC and CD respectively. If the area of the triangle APQ is half the area of that portion of the square not covered by the triangle, what is the perimeter (in cm) of triangle APQ?

**OPTIONS**

1) $\frac{40}{\sqrt{3}}$
2) $10\sqrt{2}\left(1+\frac{1}{\sqrt{3}}\right)$
3) $\frac{40}{\sqrt{3}}+10\sqrt{2}\left(1+\frac{1}{\sqrt{3}}\right)$
4) None of these

## Question of the Day #20: (13-Mar-09)

The questions below contain a stanza with a missing sentence or part of a sentence. Choose the option that most logically completes the paragraph.

Your hearts are lifted up, your hearts
That have foreknown the utter price,
Your hearts burn upward like a flame
Of splendour and of sacrifice.
For you too, to battle go,
Not with the marching drums and cheers,
_____

**OPTIONS**

1) But not a shot comes blind with death,
   And not a stab of steel is pressed
2) But in the watch of solitude
   And through the boundless night of fears.
3) But there is music in the midst of desolation
   And a glory that shines before our tears.
4) Your hearts are lifted up, your hearts
   That have foreknown the utter price,
5) Solemn the drums thrill; Death august and royal
   Sings sorrow up into immortal spheres.

## Question of the Day #21: (14-Mar-09)

On 8 × 8 chessboard, centres of black squares are joined to form squares such that line segments joining these centers will not lie in the white square area. Then how many maximum unique right angles are formed?

**OPTIONS**

1) 128
2) 32
3) 64
4) 84
5) None of these

## Question of the Day #22: (15-Mar-09)

The question below contains a paragraph with a missing sentence or part of a sentence. Choose the option that most logically completes the paragraph.

The annihilation, which some people suppose to follow upon death, and which entirely destroys this self, is nothing but an extinction of all particular perceptions; love and hatred, pain and pleasure, thought and sensation. These therefore must be the same with self; since the one cannot survive the other. Is self the same with substance?_____

**OPTIONS**

1) If they be distinct, what is the difference betwixt them?
2) If it be, how can that question have place, concerning the subsistence of self, under a change of substance?
3) For my part, I have a notion of neither, when conceived distinct from particular perceptions.
4) Philosophers begin to be reconciled to the principle, that we have no idea of external substance, distinct from the ideas of particular qualities.
5) Have you any notion of self or substance?

## Question of the Day #23: (16-Mar-09)

Asmita and Babita start running around a 10 km long circular track at the same time, from the same point, but in opposite directions. After running for 2 hrs, both of them are 4 km away from each other and both of them have not completed one round along the track. Which of the following cannot be their speeds?

**OPTIONS**

1) 1.5 km/hr, 1.5 km/hr
2) 1.4 km/hr, 1.6 km/hr
3) 3.7 km/hr, 4.3 km/hr
4) 4 km/hr, 2 km/hr
5) More than one option is correct

## Question of the Day #24: (17-Mar-09)

The question below contains a paragraph with a missing sentence or part of a sentence. Choose the option that most logically completes the paragraph.

I met a well known head hunter recently by sheer accident at a private gathering, and asked her, "So what do you think of the current global mess? I guess it exposes the over-rated over-paid over-promoted tribe of "I" bankers. The I, Me, Myself lot who cannot see beyond their annual bonuses and extravagant off-sites, and yet appear so pious about stakeholder interests". Her reply stunned me. "Oh, come on! It's not their fault. They are greedy. It's the regulators to blame". _____

**OPTIONS**

1) Welcome to the world of cowboy capitalism!
2) Of course, it is also a system failure.
3) Aren't the regulator and the government working over-time to bail-out investment dudes and crony brokers, to preserve sanity on Wall Street?
4) I shrugged my shoulders.
5) After all, it is the chief investment officer who has to take the final call.

## Question of the Day #25: (18-Mar-09)

There are 16 pipes connected to a tank. Out of these, some are inlet pipes and the others are outlet pipes. Each inlet pipe can fill the tank completely in 6 hours and each outlet pipe can drain the tank completely in 8 hours. If all the pipes are kept open, an empty tank gets filled in 1 day. How many outlet pipes are there?

**OPTIONS**

1) 7
2) 11
3) 8
4) 10
5) None of these

## Question of the Day #26: (19-Mar-09)

The question below consists of a paragraph in which the first and last sentences are identified. Choose the option that has the most logical order of the intermediate sentences.
1. "At what period", continues Grote, "these poems, or indeed any other Greek poems, first began to be written, must be matter of conjecture, though there is ground for assurance that it was before the time of Solon".

A. For whom was a written Iliad necessary? Not for the rhapsodes; for with them it was not only planted in the memory, but also interwoven with the feelings, and conceived in conjunction with all those flexions and intonations of voice, pauses, and other oral artifices which were required for emphatic delivery, and which the naked manuscript could never reproduce.

B. Not for the general public- they were accustomed to receive it with its rhapsodic delivery, and with its accompaniments of a solemn and crowded festival.

C. If, in the absence of evidence, we may venture upon naming any more determinate period, the question at once suggests itself, What were the purposes which, in that state of society, a manuscript at its first commencement must have been intended to answer?

D. The only persons for whom the written Iliad would be suitable would be a select few; studious and curious men; a class of readers capable of analyzing the complicated emotions which they had experienced as hearers in the crowd, and who would, on perusing the written words, realize in their imaginations a sensible portion of the impression communicated by the reciter.

6. Incredible as the statement may seem in an age like the present, there is in all early societies, and there was in early Greece, a time when no such reading class existed..

**OPTIONS**

1) ABCD
2) ABDC
3) CADB
4) CABD
5) DBAC

## Question of the Day #27: (20-Mar-09)

A question is followed by two statements, A and B. Answer the question using the following instructions:

Mark (1) if the question can be answered by using the statement A alone but not by using the statement B alone.

Mark (2) if the question can be answered by using the statement B alone but not by using the statement A alone.

Mark (3) if the question can be answered by using either of the statements alone.

Mark (4) if the question can be answered by using both the statements together but not by either of the statements alone.

Mark (5) if the question cannot be answered on the basis of the two statements.

If $f(x) = x^{100} + 2ax^{99} - 3a^2x^{98} - 4a^3x^{97} + \ldots + 100a^{99}x$, then, does $f(x)$ have odd number of negative real roots, given that all the roots of $f(x)$ are different?

A. The equation has 43 non negative real roots.

B. $a$ is not a complex number.

**OPTIONS**

1) 1
2) 2
3) 3
4) 4
5) 5

## Question of the Day #28: (21-Mar-09)

A. The cocks hovered on the ledges, the crows sat on the roofs; the cows and the sheep lay down in front of the pigs and started chewing the cud.
B. First arrived the two dogs, Jessie and Bluebell, and then the horses who sat in the mud bordering the platform.
C. At one end of the big shed, on a somewhat raised platform, General had already settled on his straw bed, beneath a lantern that hung from a plank.
D. He was thirteen years old and had recently grown rather overweight, but he still had a regal look, with a benevolent and intelligent appearance.
E. BEFORE long the other animals began to arrive and make themselves comfortable after their different fashions.

**OPTIONS**

1) CDEBA
2) EBACD
3) ABCDE
4) CAEBD
5) ECDAB

## Question of the Day #29: (22-Mar-09)

What is the value of the series 1/4 + 1/8 + 2/16 + 3/32 + 4/64 + ... + up to infinity?

**OPTIONS**

1) 0.5
2) 0.75
3) 0.8
4) 0.9
5) None of these

## Question of the Day #30: (23-Mar-09)

Answer the question based on the passage given below.

The number of people going online has passed one billion for the first time, according to comScore, an online metrics company. Almost 180 million internet users- over one in six of the world's online population- live in China, more than any other country. Until a few months ago America had most web users, but with 163m people online, or over half of its total population, it has reached saturation point. More populous countries such as China, Brazil and India will eventually overtake those western countries with already high penetration rates.

Which of the following assumptions underlies the conclusion that China, Brazil and India will eventually overtake western countries in the number of web users?

**OPTIONS**

1) China, Brazil, and India have population- growth rates that are much higher than those of western countries.
2) China, Brazil, and India account for more than 50 per cent of the computers sold worldwide.
3) The potential users of the web are less in western countries than in China, Brazil, and India.
4) Computer literacy in China, Brazil, and India is increasing at a higher rate than in western countries.
5) The number of web users in the western countries is expected to decline in the future.

## Question of the Day #31: (24-Mar-09)

If $x$ and $y$ are both real, what is the least possible value of the function $f(x, y) = x^2y^2 - 4x^2y + 4x^2 - 2xy^2 + 8xy - 8x + y^2 - 4y + 7$?

**OPTIONS**

1) 0
2) 1
3) 2
4) 3
5) 7

## Question of the Day #32: (25-Mar-09)

Answer the question based on the passage given below.

According to a research published in the journal *Proceedings* of the National Academy of Sciences, based on predictions of sea ice extent from climate change models, the penguins are likely to see their numbers plummet by 95% by 2100. Emperor penguins, the largest species, are unique in that they are the only penguins that breed during the harsh Antarctic winters. Colonies gather far inland after long treks across sea ice, where the females lay just one egg that is tended by the male. What is more, the extent of sea ice cover influences the abundance of krill and the fish species that eat them- both food sources for the penguins.

Which of the following can be validly concluded from the above paragraph?

**OPTIONS**

1) The Emperor penguins may shift their breeding patterns with the change in climate.
2) The climate change is occurring faster than the ability of the Antarctic birds to adapt to it.
3) The ice plays a major role in the overall breeding success of Emperor penguins.
4) Climate change can affect the reproduction and distribution of aquatic birds.
5) The Emperor penguins serve as a species that draws attention to the crisis in the Antarctic.

## Question of the Day #33: (26-Mar-09)

$$\text{If } x = 101^6 - 100^6 - \frac{101^8 - 100^8}{101^2 + 100^2}$$

The number of digits in *x* is

**OPTIONS**

1) 10
2) 11
3) 12
4) 13

## Question of the Day #34: (27-Mar-09)

Answer the question based on the passage given below.

Cattle that are named and treated with a "more personal touch" can increase milk yields by up to 500 pints a year. The study, by the university's School of Agriculture, Food and Rural Development, involved 516 farmers across the UK. Published in the journal *Anthrozoos*, the study found farmers who named their cows gained a higher yield than the 54% that did not give their cattle names.

Which of the following, if true, most seriously weakens the conclusion of the study?

**OPTIONS**

1) Farmers who named their cows had fewer cows than the farmers who had not named their cows.
2) Farmers who name their cows also name all their other animals.
3) Cows are not able to understand whether they have a name or not.
4) Even when a farmer called all his cows by the same name the yield increased.
5) The cows with names all belonged to a breed known to give higher yields.

## Question of the Day #35: (28-Mar-09)

What is the number of solution sets $(x, y)$ for the equation $x^2|y| - 10x|y| = -9$, given that $x$ and $y$ are both integers?

**OPTIONS**

1) 0
2) 2
3) 4
4) 8
5) 10

## Question of the Day #36: (29-Mar-08)

Answer the question based on the passage given below.

In the hierarchy of transplant surgery, replacing a bronchus (the passage from the main windpipe, the trachea, into a lung) does not sound difficult compared with, say, plumbing in a new heart. In fact it had never been attempted and transplant surgeons have left well-enough alone. The reason was not that the surgery itself would be hard, but that the tissue in question, which is the first line of defence against the bacteria and viruses that come with every lungful of air, has a remarkably active immune response. So active, indeed, that if you transferred part of an airway from one person to another, the resulting immunological conflict would probably kill the recipient.

Which of the following (assumptions) has led the transplant surgeons to leave the bronchus well-enough alone?

**OPTIONS**

1) A weak bronchus is less life-threatening.
2) A weak bronchus is best treated with chemicals.
3) Part of an airway cannot be transplanted from one person to another.
4) A new heart does not result in fatal immunological conflicts.
5) Any surgery to the bronchus is likely to kill the patient.

## Question of the Day #37: (30-Mar-09)

For how many two-digit positive numbers is the difference between the number itself and the number formed on reversing its digits is the perfect square of an integer?

**OPTIONS**

1) 27
2) 28
3) 37
4) 38
5) 44

## Question of the Day #38: (31-Mar-09)

Answer the question based on the passage given below.

The average person watched 26 hours and 18 minutes of broadcast TV each week in 2008, 48 minutes more than in 2007, according to industry figures. People watch more TV after buying digital recorders such as Freeview+ or Sky+. Most viewing of online services was to keep up with missed shows. 78% of viewing of services like BBC iPlayer, ITV Player and 4oD was to catch up with programmes people would normally watch live. These figures show that people rely on channels and schedules to help them find the TV they want to watch.

Which of the following can be inferred from the above?

**OPTIONS**

1) TV remains people's most preferred form of entertainment.
2) TV is the most effective medium for advertisers.
3) TV viewing has reached a record high in 2008.
4) Online TV and digital recorders have reduced live TV viewership.
5) None of the above.

## Question of the Day #39: (01-Apr-09)

An ant is sitting at the centre of one of the faces of a solid cube (kept in the space) of side 4 m. Poisonous material is kept at all the vertices of the cube and the effect of poison spreads to 2 m in all the directions. If the ant wants to visit all the faces of the cube, then what is the minimum distance (in m) that she must travel to get back to the original position?

**OPTIONS**

1) $(5\pi + 4)$m
2) $(6\pi + 2)$m
3) 24 m
4) 12 m
5) None of these

## Question of the Day #40: (02-Apr-09)

Answer the question based on the passage given below.

"Come and say G'day", a tourist campaign built round Paul Hogan, the star of "Crocodile Dundee", brought visitors swarming to Australia. 25 years later, with the country's tourism business back in the doldrums, the authorities are hoping that another quirky outback movie will pull the same trick. "Australia", is the most expensive Australian film ever made. But its box-office takings were disappointing and its reviews have been pretty sad. Tourism Australia, the government body that spins the country to potential visitors, is pouring A$ 50m into a campaign linked to the film.

Which of the following, if true, may lead to the failure of the campaign?

**OPTIONS**

1) Australia, the country is suffering from a "lack of fashionability and buzz" which attract tourists.
2) Apart from the film's lukewarm reception, the global economic climate is bleak.
3) A film cannot sell a country.
4) The success of the campaign depends on the success of the movie.
5) "Australia" has the country's biggest cinema names: Baz Lurhmann, Nicole Kidman, and Hugh Jackman.

## Question of the Day #41: (03-Apr-09)

If the equations $a^2x^4 + a^2(a-4)x^3 + (24 + 6a^2 - 3a^3)x^2 + (3a^3 - 4a^2 - 10a - 48)x + (24 + a^2 + 20a - b) = 0$ and $x^2 - 3x + 2 = 0$ have 2 common roots, which of the following is definitely false?

**OPTIONS**

1) $a = 1$
2) $a = 2$
3) $a = 4$
4) $a = 6$
5) More than one option is false

## Question of the Day #42: (04-Apr-09)

The questions below contain a paragraph followed by alternative summaries. Choose the option that best captures the essence of the paragraph.

For the past eight years, America's government has declined to fund new research into one of the world's most promising medical technologies: the use of human embryonic stem cells to repair or replace damaged tissue in the diseased and injured. Embryonic stem cells are special for two reasons, one scientific and one ethical. The scientific reason is that they are able to turn into any of the body's myriad cell types, which is why they might be used in this way. The ethical reason is that, at the moment, harvesting them usually involves killing human embryos. The embryos in question have no future anyway (they are usually "spares" from in vitro fertilisation procedures). But it was this destruction of potential human life that disturbed George Bush and his supporters.

**OPTIONS**

1) Embryonic stem cell research is disapproved by the American government on scientific and ethical grounds.
2) Though scientifically important, stem cell research is not encouraged by the American government for it involves destruction of human life.
3) Since embryonic stem cell research and therapy include destruction of human life; hence the American government did not encourage it in the past.
4) Though embryonic stem cell research is one of the most promising medical technologies, the American government discourages it because it may involve destruction of human life.
5) Though medically vital for curing damaged organs, stem cell research is not financed by the American government because it involves potential destruction of human life.

## Question of the Day #43: (05-Apr-09)

ABCDEF is a regular hexagon of side $2a$ units, If circles are drawn taking each side of the hexagon as diameter then what is the area inside the hexagon that is not covered by circles?

**OPTIONS**

1) $\frac{\sqrt{3}a^2}{4}(12-\sqrt{3}\pi)$
2) $(3\sqrt{3}-\pi)a^2$
3) $(6\sqrt{3}+4\pi)a^2$
4) $\frac{a^2}{2}(6\sqrt{3}+\pi)$
5) None of these

## Question of the Day #44: (06-Apr-09)

The question below contains a paragraph followed by alternative summaries. Choose the option that best captures the essence of the paragraph.
When trying to explain past phenomena, palaeontologists and other historical scientists often construct a set of hypotheses about the causes and then look for a "smoking gun", a piece of evidence which indicates that one of the hypotheses is a better explanation than the others. Sometimes the "smoking gun" is discovered by a fortunate accident during other research. For example, the discovery by Luis Alvarez and Walter Alvarez of an iridium-rich layer at the Cretaceous-Tertiary boundary made asteroid impact and volcanism the most favored explanations for the Cretaceous–Tertiary extinction event. The other main type of science is experimental science, which is often said to work by conducting experiments to disprove hypotheses about the workings and causes of natural phenomena- note that this approach cannot prove a hypothesis is correct, since some later experiment may disprove it. However, when confronted with totally unexpected phenomena, such as the first evidence for invisible radiation, experimental scientists often use the same approach as historical scientists: construct a set of hypotheses about the causes and then look for a "smoking gun".

**OPTIONS**

1) Historical scientists aim to describe past phenomena by reconstructing their causes through a set of hypotheses and then look for evidence. Experimental scientists who generally try to disprove hypotheses about phenomena resort to this method only when confronted by unexpected phenomena.
2) Palaeontologists, like historical scientists, describe past phenomena through their causes and then look for evidence. Experimental scientists try to disprove hypotheses about phenomena but when confronted by unexpected phenomena, form hypotheses about them.
3) Historical scientists like palaeontologists, describe past phenomena by reconstructing a set of hypotheses about their causes and then look for the 'smoking gun'. Experimental scientists first look for the 'smoking gun' and then form hypotheses.
4) Palaeontologists and other historical scientists describe past phenomena and their causes through a set of hypotheses and then look for evidence. Experimental scientists resort to this method only when confronted by unexpected phenomena.
5) Palaeontologists and other historical scientists describe past phenomena and their causes through the discovery of a 'smoking gun'. Experimental scientists, who try to disprove hypotheses about phenomena until proven wrong, resort to this method only when confronted by unexpected phenomena.

## Question of the Day #45: (07-Apr-09)

A small billiard board is in shape of a rectangle PQRS where PQ = 10 cm and QR = 40 cm. A ball is initially kept at point A which is midpoint of RS, and the ball at A is struck towards side QR such that its direction initially makes an angle of 45° with AR. If its uniform speed on the board is $\sqrt{2}$cm/s and does not decrease with time, and if it reflects from the sides of the board in such a manner that the angle it makes with the perpendicular to the sides of the board before striking is same after it gets rebounded by the sides. Approximately how much time will pass before it hits the side QR for the 361st time?

**OPTIONS**

1) Less than 1 hour
2) 1 hour
3) Between 1 hour and 2 hour
4) 2 hour
5) Greater than 2 hour

## Question of the Day #46: (08-Apr-09)

The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

By turning over stones the naturalist may find ground-beetles in company with the larvae of their own species. On the leaves of a willow tree he may observe leaf-beetles (*Phyllodecta* and *Galerucella*) together with their grubs, all greedily eating the foliage; or lady-bird beetles (*Coccinella*) and their larvae hunting and devouring the 'greenfly.' All of these insects are, however, *Coleoptera*, and the adult insects of this order are much more disposed to walk and crawl and less disposed to fly than other *endopterygote* insects. _____

**OPTIONS**

1) Their heavily armoured bodies and their firm shield-like forewings render them less aerial than other insects.
2) In many genera the power of flight has been altogether lost.
3) It is not surprising, therefore, that many beetles, even when adult, should live as their larvae do; since the acquirement of complete metamorphosis they have become modified towards the larval condition, and an extreme case of such modification is afforded by the wingless grub-like female Glow-worm (Lampyris).
4) With most insects, however, the larva must be regarded as the more specially modified, even if degraded, stage.
5) Miall (1895) has pointed out that the insect grub is not a precociously hatched embryo, like the larvae of multitudes of marine animals, but that it exhibits in a modified form the essential characters of the adult.

## Question of the Day #47: (09-Apr-09)

How many four digit numbers are there such that the sum of their first two digits is equal to the sum of the last two digits?

**OPTIONS**

1) 615
2) 620
3) 605
4) 630
5) None of these

## Question of the Day #48: (10-Apr-09)

The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

Life is a self-renewing process through action upon the environment. In all the higher forms this process cannot be kept up indefinitely. After a while they succumb; they die. _____

**OPTIONS**

1) As some species die out, forms better adapted to utilize the obstacles against which they struggled in vain come into being.
2) The creature is not equal to the task of indefinite self-renewal.
3) But continuity of the life process is not dependent upon the prolongation of the existence of any one individual.
4) Reproduction of other forms of life goes on in continuous sequence.
5) And though, as the geological record shows, not merely individuals but also species die out, the life process continues in increasingly complex forms.

## Question of the Day #49: (11-Apr-09)

A 101 digit number 222...2*y*3...333 is formed by repeating the digit 2 fifty times, followed by the digit *y* and then repeating the digit 3 fifty times. The number is a multiple of 7. What is the value of *y*?

**OPTIONS**

1) 2
2) 3
3) 4
4) 5
5) None of these

## Question of the Day #50: (12-Apr-09)

The question below contains a paragraph followed by alternative summaries. Choose the option that best captures the essence of the paragraph.

Zoroastrianism is the religion and philosophy based on the teachings ascribed to the prophet Zarathustra. This term is essentially synonymous with Mazdaism, which acknowledges the divine authority of Ahura Mazda, proclaimed by Zarathustra, as demonstrated by Zoroastrianistic creed and articles of faith. Zoroastrianism was once the dominant religion of much of Greater Iran, practiced by the Iranian tribes, including but not limited to the Persians, the Pashtoons, the Balochis, the Ossetics, the Yaghnobi, and the Kurds. However, following the arrival of Islam, the number of adherents has dwindled to not more than 250,000 Zoroastrians worldwide, with concentrations in India, Iran and Pakistan.

**OPTIONS**

1) Zoroastrianism and Mazdaism religions based on Zarathustra's teachings dominated the Iranian tribes until Islam caused it to decline. It is now confined to concentrations in India, Iran and Pakistan.
2) Zoroastrianism or Mazdaism the dominant religion of Iran was founded by Prophet Zarathustra. However Islam caused its decline to merely 250,000 followers in the world.
3) The once dominant religion and philosophy propounded by Zarathustra declined after the coming of Islam and it has very few followers spread across India, Iran and Pakistan.
4) Owing to the advent of Islam, adherents of Zoroastrianism declined to not more than 250,000 worldwide spread across India, Iran and Pakistan.
5) Zoroastrianism or Mazdaism, based on the teachings of prophet Zarathustra was once the dominant religion of Iranian tribes. However, after the coming of Islam Zoroastrianism was relegated to a few in India, Iran and Pakistan.

## Question of the Day #51: (13-Apr-09)

A bridge 'AB' has a single railway track spanning its entire width. A cat is standing on the bridge 20 m away from the centre of the bridge. The cat sees a train coming at a constant speed of 72 km/hr. The distance of the train (assumed as a point object) from the nearer end (point A) of the bridge is twice the length of the bridge. If the cat runs towards the train with a constant speed, it will get off the bridge to safety when the train is still 50 m from the bridge. If it runs away from the train at the same constant speed, the train will hit it when it is still 12.5 m from the end of the bridge. A man is also standing on the same bridge at a distance *x* from point A, what would be the range of the values of *x* (in m) for which the man will be safe, if he starts running (at the same time and with the same speed of cat) towards the train? (All speeds remaining the same)

**OPTIONS**

1) 0 to 20
2) 0 to 30
3) 0 to 40
4) 0 to 50
5) None of these

## Question of the Day #52: (14-Apr-09)

The question below contains a paragraph followed by alternative summaries. Choose the option that best captures the essence of the paragraph.

In *The Birth of Tragedy* Nietzsche presented his theory of the ancient dualism between two types of aesthetic experience, namely the Apollonian and the Dionysian; a dualism between the plastic "art of sculpture", of lyrical dream-inspiration, identity, order, regularity, and calm repose, and, on the other hand, the non-plastic "art of music", of intoxication, forgetfulness, chaos, and the ecstatic dissolution of identity in the collective. The analogy with the world of the Greek gods typifies the relationship between these extremes: two godsons, incompatible and yet inseparable. According to Nietzsche, both elements are present in any work of art.

**OPTIONS**

1) In *The Birth of Tragedy* Nietzsche stated that any work of art contains the ancient Greek elements typified by Apollo and Dionysius.
2) In *The Birth of Tragedy* Nietzsche said that the elements of identity and the dissolution of identity symbolised by the Apollonian and the Dionysian are both present in any work of art.
3) In *The Birth of Tragedy* Nietzsche argued that any work of art contains the incompatible but inseparable elements of identity and the dissolution of identity in the collective.
4) In *The Birth of Tragedy* Nietzsche presented his theory of dualism, that of identity and the lack of it typified by the Greek gods Apollo and Dionysius.
5) In *The Birth of Tragedy* Nietzsche presented his theory of dualism in any work of art that of “art of sculpture” and of “art of music”.

## Question of the Day #53: (15-Apr-09)

If $12(\log_5 y)^2 - x - 54\log_5 y$

$= (\log_5 y)^3 - 108$, and

$x + 9\log_y 8 = 27(\log_y 25 + \log_y 10)$

Where $y$ is a real number and $y > 1$.

If $\log_{10} 5 \approx 0.7$, what is the approximate value of $\log_{10} y$?

**OPTIONS**

1) 3.4
2) 2.1
3) 4.2
4) 1.7
5) 2.6

## Question of the Day #54: (16-Apr-09)

Given below is a passage followed by several statements that can be drawn from the facts stated in the passage. Examine each statement separately in the context of the passage and decide whether they are implied from the passage.

Apparently at ease with risk, the businessmen and bankers who are investing in the phoenix-like rebirth of Alitalia submitted an offer for the airline's assets to the bankrupt flag-carrier's administrator on October 31st, even after failing to convince pilots and cabin crew to sign new contracts. But although fuel costs have fallen lately, the outlook for aviation has worsened. The economic slowdown is weakening demand. And now fierce competition is threatening the airline's services between Rome and Milan - a core part of its business.

A. Competition threatens Alitalia's revival.
B. The outlook for aviation industry is bleak because of spiralling fuel costs.
C. The businessmen and bankers haven't anticipated the weakening demand in aviation.
D. But for the businessmen and bankers, Alitalia would have been fully out of business.

**OPTIONS**

1) A only
2) A and D
3) B and C
4) A, C and D
5) D only

## Question of the Day #55: (17-Apr-09)

What is the largest 3 digit prime factor of the integer ${}^{2000}C_{1000}$?

**OPTIONS**

1) 661
2) 211
3) 733
4) 859
5) None of these

## Question of the Day #56 (18-Apr-09)

Given below is a passage followed by several statements that can be drawn from the facts stated in the passage. Examine each statement separately in the context of the passage and decide whether they are implied from the passage.

Compared with groups who lobby to save animals or trees, campaigners who lobby to preserve languages are themselves a rare breed. But they are trying both to mitigate and publicise an alarming acceleration in the rate at which languages are vanishing. Of some 6,900 tongues spoken in the world today, some 50% to 90% could be gone by the end of the century. In Africa, at least 300 languages are in near-term danger, and 200 more have died recently or are on the verge of death. Some 145 languages are threatened in East and South-East Asia.

A. Languages are endangered just the way animals or trees are endangered.
B. Very few people campaign for preserving languages.
C. African languages are more susceptible to extinction.
D. In a century the world will have fewer languages than it has today.

**OPTIONS**

1) A only
2) A and B
3) A, B and D
4) C and D
5) B and C

## Question of the Day #57: (19-Apr-09)

Let $N = 101 \times 10001 \times 100000001 \times (10000\ldots0001)$ where the last factor of $N$ has $(2^7 - 1)$ zeros between the two one's at the extremes of the number. What will be the number of one's in the final product of $N$?

**OPTIONS**

1) 256
2) 129
3) 128
4) 127
5) None of these

## Question of the Day #58: (20-Apr-09)

The following question has five word pairs. Choose the option that presents the best choice of words in each pair.

The **(A) castor/caster (B)** had just arrived home. He had **(A) munched/minced (B)** on raw onions with his food. As soon he started talking, his wife gave him a **(A) baleful/baneful (B)** look. For **(A) awhile/a while (B)** he did not understand. Once he did, he immediately put a **(A) cashew/cachou (B)** in his mouth.

**OPTIONS**

1) AAABB
2) AABBB
3) BAABB
4) BBABB
5) BABAA

## Question of the Day #59: (21-Apr-09)

A group of boys is playing cricket. Intezam is at the striker's end of the pitch and Sachit is at the non-striker's end. Intezam hits the ball far into the outfield and the batsmen start running. Each of them runs at a constant speed, though their speeds are not necessarily equal. They first cross each other at a distance of 9 ft from the striker's end while running the first run. They immediately turn back for the second run and cross each other at a distance of 3 ft from the non-striker's end while running for the second run. After this, they turn back for the third run and so on. What is the total distance (In feet) Sachit has run when they cross each other for the third time?

**OPTIONS**

1) 45
2) 54
3) 60
4) 75
5) None of these

## Question of the Day #60: (22-Apr-09)

The following question has five word pairs. Choose the option that presents the best choice of words in each pair.
The heads of the nation worked for the **(A) ascent/assent (B)** of the country. They wanted it to reach **(A) autarchy/autarky (B)**. With economic self-sustainability and good governance, they hoped to pick up the **(A) dissembled/disassembled (B)** pieces and put them back together. They asked the **(A) depositary/depository (B)** to release funds with due wisdom. They asked the people to **(A) detract/detrain (B)** themselves from anything against development and freedom.

**OPTIONS**

1) ABBAA
2) AABAA
3) BBBAA
4) ABAAB
5) AABBA

## Question of the Day #61: (23-Apr-09)

The length of the non equal side of an isosceles triangle is 12 units. The semiperimeter of the triangle (in units) is a root of the equation $x^2 - 32x + 240 = 0$. What is the area of the triangle (in square units)?

**OPTIONS**

1) Such a triangle does not exist
2) $48\sqrt{5}$
3) 20
4) $24\sqrt{10}$
5) None of these

## Question of the Day #62: (24-Apr-09)

Answer the question based on the passage given below.

The most remarkable feature of the recent virus attack (agent.btz) on the classified network that alarmed pentagon may not be the breach of security, but the cost of dealing with it. In the civilian world, at least one bank has dealt with agent.btz by blocking all its computers' USB ports with glue. Every bit of portable memory in the sprawling American military establishment now needs to be scrubbed clean before it can be used again. In the meantime, soldiers will find it hard or outright impossible to share, say, vital digital maps, let alone synch their iPods or exchange pictures with their families.

Which of the following can be validly concluded about agent.btz?

**OPTIONS**

1) It is designed specifically to target military networks.
2) It infects only portable memory devices.
3) It spreads through portable memory devices.
4) Glue is an effective measure against agent.btz.
5) Portable memory devices can be scrubbed clean using glue.

## Question of the Day #63: (25-Apr-09)

Which of the following numbers cannot be written as a sum of squares of any four integers?

**OPTIONS**

1) 310
2) 123
3) 59
4) 67
5) None of these

## Question of the Day #64: (26-Apr-09)

Answer the question based on the passage given below.

All around the world, species are vanishing as their habitat is turned over to crops. Such land conversion is particularly severe in the tropics, where most of the world's species live. And though nature reserves offer some respite, they are unlikely to be enough on their own. However, a survey in the Western Ghats conducted by the National Academy of Sciences shows that the area had been cultivated for over 2,000 years, but still remains a hotspot for biodiversity. The Academy looked at birds in different areas of vegetation, including intact forest, plantations and shrub land and found that local plantations of areca palms retained 90% of the birds associated with native forest.

Which of the following can be inferred from the passage?

**OPTIONS**

1) Farming and wildlife are not easy bedfellows.
2) The cultivation of the areca palms is widespread in the Western Ghats.
3) The areca palms provides habitat for the forest birds in the region.
4) Areca plantations are biodiversity-friendly.
5) The Western Ghats are hospitable to birds.

## Question of the Day #65: (27-Apr-09)

In a ΔABC, point D is the midpoint of side BC. It is also known that BC > AC > AB and BC = 2AB. The lengths of the sides of the triangle form an arithmetic progression with the middle term equal to 4.5 units. What is the approximate length of AD (in units)?

**OPTIONS**

1) 11.25
2) 2.35
3) 3.45
4) 1.95
5) 3.15

## Question of the Day #66: (28-Apr-09)

The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

A community or social group sustains itself through continuous self-renewal, and this renewal takes place by means of the educational growth of the immature members of the group. By various agencies, unintentional and designed, a society transforms uninitiated and seemingly alien beings into robust trustees of its own resources and ideals. Education is thus a fostering, a nurturing, a cultivating, process. All of these words mean that it implies attention to the conditions of growth. We also speak of rearing, raising, bringing up- words which express the difference of level which education aims to cover. Etymologically, the word education means just a process of leading or bringing up. When we have the outcome of the process in mind, we speak of education as shaping, forming, molding activity._____

**OPTIONS**

1) Since what is required is a transformation of the quality of experience till it partakes in the interests, purposes, and ideas.
2) Beliefs and aspirations can be physically extracted and inserted.
3) The required beliefs can be hammered in; the needed attitudes can be plastered on.
4) That is, a shaping into the standard form of social activity.
5) Thus it gradually produces in an individual a certain system of behavior, a certain disposition of action.

## Question of the Day #67: (29-Apr-09)

If $0° < x, y, z < 90°$, what is the value that the following expression cannot attain?

$$\frac{(\sin x + \sin y)(\sin y + \sin z)(\sin z + \sin x)}{\sin x . \sin y . \sin z}$$

**OPTIONS**

1) 8.7
2) 8
3) 7.9
4) 9
5) None of these

## Question of the Day #68: (30-Apr-09)

The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

There is a certain sense in which we should feel a sympathy with children in the wrong that they do. It would seem paradoxical to say that in any sense there should be sympathy with sin, and yet there is a sense in which this is true, though perhaps, strictly speaking, it is sympathy with the trial and temptation which led to the sin, rather than with the act of transgression itself. In whatever light a nice metaphysical analysis would lead us to regard it, it is certain that the most successful efforts that have been made by philanthropists for reaching the hearts and reforming the conduct of criminals and malefactors have been prompted by a feeling of compassion for them, not merely for the sorrows and sufferings which they have brought upon themselves by their wrongdoing, but for the mental conflicts which they endured, the fierce impulses of appetite and passion, more or less connected with and dependent upon the material condition of the bodily organs, under the onset of which their feeble moral sense, never really brought into a condition of health and vigor, was over-borne. These merciful views of the diseased condition and action of the soul in the commission of crime are in themselves right views for man to take of the crimes and sins of his fellow-man.____.

**OPTIONS**

1) For what would otherwise differentiate a man from a beast?
2) They also lie at the foundation of all effort that can afford any serious hope of promoting reformation.
3) From mercy comes compassion and from compassion, all forms of love and co-habitation.
4) It helps to pardon the sins, rather than punish the person who in the first place is incapable of discerning victory and glory from humiliation and defeat.
5) They also provide a basis for starting a world where one gets a chance to relive and conjoin rather than living a life of a destitute.

## Question of the Day #69: (01-May-09)

In ΔABC the length of sides AB, AC and BC are 8 cm, 6 cm and 10 cm respectively. If point D is on side BC and BD : DC = 2 : 3, what is the approximate length of AD?

**OPTIONS**

1) 5.4 cm
2) 6 cm
3) 4.5 cm
4) 5.6 cm
5) 6.1 cm

## Question of the Day #70: (02-May-09)

Fill in the blanks in the passage with the most appropriate set of words from the options for each blank.

He sighed again, and Rachel knew that for the hundredth time he was _____ his own past weakness. He had been so foolish in money matters, _____ away his once considerable capital in aimless _____. He and his sister had shared equally under their father's will, but while he had been at last _____ to sink the greater part of what was left to him in an annuity, she had probably increased her original inheritance.

**OPTIONS**

1) Regretting, Frittering, Speculations, Compelled
2) Implying, Frittering, Day dreaming, Infamous
3) Regretting, Squandering, Trifles, Emulated
4) Implying, Squandering, Speculations, Pressured

## Question of the Day #71: (03-May-09)

The totient $\Phi(n)$ of a positive integer $n$ is defined as the number of positive integers less than or equal to $n$ that are co prime to $n$. It follows from the definition that $\Phi(1) = 1$. Also, $\Phi(9) = 6$ since there are six positive integers (1, 2, 4, 5, 7 and 8) less than 9 are co prime to 9. Which of the following relations holds true for $\Phi(n)$ if $m$ and $n$ are co prime?

**OPTIONS**

1) $\Phi(m) + \Phi(n) \geq \Phi(m + n)$
2) $\Phi(m - n) \leq \Phi(m) - \Phi(n)$
3) $\Phi(m \times n) = \Phi(m) \times \Phi(n)$
4) $\Phi(m + n) = \Phi(m) + \Phi(n)$
5) $\Phi(m - n) > \Phi^2(m) - \Phi(n)$

## Question of the Day #72: (04-May-09)

The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

If a plague carried off the members of a society all at once, it is obvious that the group would be permanently done for. Yet the death of each of its constituent members is as certain as if an epidemic took them all at once. But the graded difference in age, the fact that some are born as some die, makes possible through transmission of ideas and practices the constant reweaving of the social fabric. Yet this renewal is not automatic. _____

**OPTIONS**

1) Now it is a work of necessity.
2) Unless pains are taken to see that genuine and thorough transmission takes place, the most civilized group will relapse into barbarism and then into savagery.
3) In fact, the human young are so immature that if they were left to themselves without the guidance and succor of others, they could not acquire the rudimentary abilities necessary for physical existence.
4) The young of human beings compare so poorly in original efficiency with the young of many of the lower animals that even the powers needed for physical sustentation have to be acquired under tuition.
5) How much more, then, is this the case with respect to all the technological, artistic, scientific, and moral achievements of humanity!

## Question of the Day #73: (05-May-09)

Mr. Sharma goes to the market with Rs. 252 in his pocket. Each mango and watermelon costs Rs. 4 and Rs. 3, respectively. He cannot exactly remember the number of mangoes and water melons that his wife had told him to get. He remembers that

- The number of watermelons and mangoes were not co prime to each other.
- The number of mangoes he has to buy has to be a multiple of 4.
- The difference between the number of watermelons and mangoes bought has to be minimum but it cannot be zero.
- He has to buy at least one watermelon and mango, respectively.

The amount spent to buy mangoes is?

**OPTIONS**

1) Rs. 98
2) Rs. 96
3) Rs. 192
4) Rs. 188
5) Cannot be determined

## Question of the Day #74: (06-May-09)

Fill in the blanks in the passage with the most appropriate set of words from the options for each blank.

My object has been to produce a work which should be as ____ representative of the present state of the logic of the Oxford Schools as any of the text-books of the past. The qualities which I have aimed at before all others have been clearness and_____. For the task which I have taken upon myself I may claim one qualification- that of_____; since more than seventeen years have now elapsed since I took my first pupil in logic for the Honour School of Moderations, and during that time I have been pretty continuously _____ in studying and teaching the subject.

**OPTIONS**

1) rarely, inconsistency, inexperience, disengaged.
2) thoroughly, consistency, experience, engaged.
3) thoroghly, consistency, experience, engaged.
4) rarely, consistency, inexperience, disengaged.
5) thoroughly, inconsistency, experience, disengaged.

## Question of the Day #75: (07-May-09)

$f$ is a polynomial function for real $x$ such that $f(x^2 + 1) = x^4 + 7x^2 + 9$. If $f(x^2 + 1) = g(x^2 - 1)$, then what is the value of '$p$' for which $f(g(p)) = g(f(p))$?

**OPTIONS**

1) 1
2) 3
3) 7
4) 49
5) None of these

## Question of the Day #76: (08-May-09)

The question below consists of a paragraph in which the first and last sentences are identified. Choose the option that has the most logical order of the intermediate sentences.

1. Internal combustion engines require lubrication in operation to allow moving parts to slide smoothly over each other.

A. As engines were adapted for automotive and aircraft use, the need for a high power-to-weight ratio led to increased speeds, higher temperatures, and greater pressure on bearings which in turn required pressure-lubrication for crank bearings and connecting-rod journals.

B. Insufficient lubrication will subject the engine to rapid wear and ultimately, it may even seize up entirely.

C. Early slow-speed stationary and marine engines were lubricated by gravity from small chambers similar to those used on steam engines at the time—with an engine tender refilling these as needed.

D. Simple two-stroke engines are lubricated by oil mixed into the fuel or injected into the induction stream as a spray.

6. This was provided either by a direct lubrication from a pump, or indirectly by a jet of oil directed at pickup cups on the connecting rod ends which had the advantage of providing higher pressures as the engine speed increased.

**OPTIONS**

1) BDCA
2) BCAD
3) CBAD
4) CABD
5) ABCD

## Question of the Day #77: (09-May-09)

If,

$$f(a,b,c) = \max\left(\frac{a}{2}, b, \frac{c}{3}\right),$$

$g(a, b, c) = \min(2a, b, 3c)$,
$h(a, b, c) = \max\{\min(a, b), \min(b, c), \min(c, a)\}$,
$k(a, b, c) = \min(m, n, p)$,
Where, $m = \max(a, b)$,
$n = \min(a, b, c)$,

$$\text{and}, p = \max\left(\frac{a}{3}, \frac{b}{3}, \frac{c}{3}\right)$$

Which of the following is true?

**OPTIONS**

1) $k\{f(2, 3, 6), g(2, 5, 1), h(2, 3, 1)\} = 2$
2) $g(4, 8, 2) > f(6, 5, 12)$
3) $k(4, 9, 16)$ is a perfect square
4) Only two of the options are true
5) All the three options are true

## Question of the Day #78: (10-May-09)

The question below consists of a set of labelled sentences. These sentences, when properly sequenced, form a coherent paragraph. Choose the most logical order of sentences from among the options.

A. Earlier this year Arvind Panagariya of Columbia University published "India: The Emerging Giant".
B. These expatriates rarely forget their country of origin.
C. It has enough of them to run the country with plenty left over to fill prestigious positions at foreign universities and international organisations.
D. India has always produced more economists than it can consume locally.

**OPTIONS**

1) ACBD
2) DCBA
3) DBCA
4) ADCB
5) DACB

## Question of the Day #79: (11-May-09)

The following algorithm is used to calculate the value of *p.*

Step 1: $x = 1$, $y = 1$ and $p = 0$

Step 2: If $y$ is a perfect square other than 1, then go to step 7

Step 3: $x = x + y$

Step 4: $y = y + x$

Step 5: If $x$ is prime number, then $p = p + x + y$, otherwise $p = p$

Step 6: Go to step 2

Step 7: $p = p + x + y$

Step 8: Stop

What is the final value of $p$?

**OPTIONS**

1) 518
2) 721
3) 156
4) 285
5) None of these

## Question of the Day #80: (12-May-09)

The question below consists of a set of labelled sentences. These sentences, when properly sequenced, form a coherent paragraph. Choose the most logical order of sentences from among the options.

A. The policy change to a more liberalized economy is explicitly identified using instrumental variables.

B. In the case of the Chinese regions, the presence of export processing zones may exert positive effect on the regional growth rate but the increase in regional growth is even more export inelastic than at the national level.

C. The results provide support that export growth does have a positive and statistically significant effect on economic growth in these countries.

D. In a comprehensive econometric study on the SEZ policies in China and India, Leong investigates the impact of opening up the China and Indian economy on economic growth in these countries using new panel data sets for both the national economies and the regional economies of China.

E. The growth rates of the countries are export and FDI inelastic, in the sense that a one percentage point increase in growth rate of export or FDI will have a less than one percentage point increase in the economic growth rate of these countries.

**OPTIONS**

1) DBCAE
2) ACDBE
3) DACBE
4) DCBEA
5) ABCED

## Question of the Day #81: (13-May-09)

Three different percentage discounts are offered by a shopkeeper to 3 different customers on an item. Shopkeeper marked the price of the item 25% above the cost price. If the prices at which 3 customers buys these items are in A.P. and the discount percentages offered are natural numbers, then in how many ways shopkeeper can do this so that he does not bear loss from any of these customers?

**OPTIONS**

1) 150
2) 90
3) 360
4) 270
5) None of these

## Question of the Day #82: (14-May-09)

The question below contains a paragraph followed by four alternative summaries. Choose the option that best captures the essence of the paragraph.

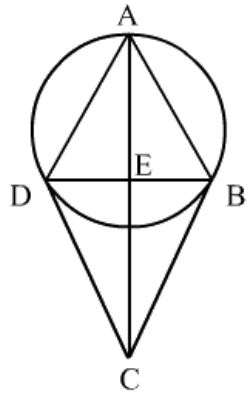
Allegory is generally treated as a figure of rhetoric, but an allegory does not have to be expressed in language: it may be addressed to the eye, and is often found in realistic painting, sculpture or some other form of mimetic or representative art. The etymological meaning of the word is broader than the common use of the word. Though it is similar to other rhetorical comparisons, an allegory is sustained longer and more fully in its details than a metaphor, and appeals to imagination, while an analogy appeals to reason or logic. The fable or parable is a short allegory with one definite moral.

**OPTIONS**

1) An Allegory is a figure of rhetoric and can be visual too; it is broader and appeals to imagination as opposed to a metaphor which appeals to logic.
2) An Allegory is a figure of rhetoric and can be visual as well as verbal, and appeals to imagination as opposed to a metaphor which is verbal and appeals to logic or reason.
3) An Allegory, a figure of rhetoric, is visual and verbal; it is sustainable and appeals to the imagination like a parable.
4) Though an allegory is similar to metaphor and analogy, it is a broader figure of rhetoric appealing to imagination as a fable does.
5) Allegories are sustained more fully and longer than other rhetorical comparisons like metaphor or analogy; They can be visual too.

## Question of the Day #83: (15-May-09)

The figure ABCD is a kite, with a circle passing though the points A, B and D. The length of side AB = 5 units and the area of ΔABD is 12 square units. What is the radius of the circle (in units) given that all sides of ΔABD have integral values and AE > BE = DE?




**OPTIONS**

1) $\frac{5}{4}$
2) $\frac{25}{8}$
3) 4
4) 6
5) None of these

## Question of the Day #84: (16-May-09)

The following question has a sentence from which the last part has been deleted. From the given options, choose the one that completes the sentence in the most appropriate way.

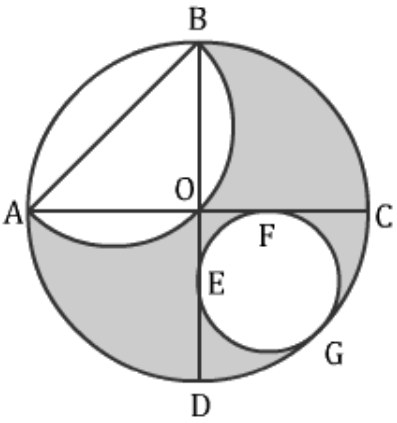
Vital religion begins for a man when lie first discovers the reality of the living GOD. Most men indeed profess a belief in GOD, a vague acknowledgment of the existence of "One above"
_____

**OPTIONS**

1) and that is when some men begin to move away from priesthood
2) but that is when some men begin to move to priesthood
3) yet the belief overpowers everything the society does
4) but the belief counts for little in their lives.
5) and the belief counts for little in their lives.

## Question of the Day #85: (17-May-09)

A big circle of diameter '4*a*' units is drawn with centre O. Then a semi-circle (with diameter AB) is drawn inside the big circle in such way that its circumference passes through the center of the big circle and then a small circle is drawn inside the big circle touching the big circle at G and two perpendicular radius OC and OD at E and F, as shown in the figure. What will be the area of the shaded region in square units?




**OPTIONS**

1) $2a^2[1+(8\sqrt{2}-5)\pi]$
2) $2a^2[1+(4\sqrt{2}-5)\pi]$
3) $4a^2[1+(8\sqrt{2}+1)\pi]$
4) $4a^2[1+(4\sqrt{2}-1)\pi]$
5) None of these

## Question of the Day #86: (18-May-08)

The question consists of a certain number of sentences. Some sentences are grammatically incorrect or inappropriate. Select the option that indicates the grammatically correct and appropriate sentence(s).

A. Her mother had never cut corners; even in Madison she had run her household as if to satisfy her mother-in-law's fastidious eye.

B. The more haste, the lesser speed.

C. Field guides seldom explain which funguses are edible.

D. He was now sufficiently composed to order a funeral as modest magnificence.

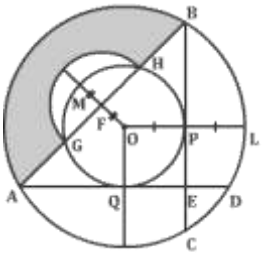
E. Section 309 of the Indian Penal Code says that, whoever attempts to commit suicide and does any act towards the commission of such offence shall be punished with simple imprisonment for a term which may extend to one year or with fine, or with both.

**OPTIONS**

1) B and E
2) A and E
3) A, B and C
4) A and C
5) A, C, E

## Question of the Day #87: (19-May-09)

As shown in the figure, two concentric circles are drawn with radius of the outer circle equal to '4$a$' units. Two equal and perpendicular chords AD and BC touch the inner circle at Q and P respectively. Chord BC bisects OL and MF ≈ FO. A semicircle is drawn with GH as a diameter. If MO is perpendicular to GH, then what will be the area of the shaded region in square units?




**OPTIONS**

1) $\left[\frac{33}{6}\pi - 2\sqrt{15}\right]a^2$
2) $\left[\frac{15}{6}\pi - \sqrt{15}\right]a^2$
3) $\left[\frac{35}{6}\pi - \sqrt{15}\right]a^2$
4) $\left[\frac{31}{6}\pi - \sqrt{15}\right]a^2$
5) $44\pi a^2$

## Question of the Day #88: (20-May-09)

Answer the following question based on the information given below.

Everyone has a doctor in him or her; we just have to help it in its work. The natural healing force within each one of us is the greatest force in getting well. Our food should be our medicine. Our medicine should be our food. But to eat when you are sick is to feed your sickness.

Which of the following logically follows from the above?

**OPTIONS**

1) We should not eat when we are sick.
2) Everyone is a doctor.
3) Right food helps in healing.
4) The natural healing force comes from food.
5) All of the above.

## Question of the Day #89: (21-May-09)

If $P = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \cdots + \frac{1}{n!}$,

Where $n > 15$, which of the following is true?

**OPTIONS**

1) $2 < P < \frac{11}{3}$
2) $2 < P < \frac{16}{5}$
3) $2 < P < \frac{18}{5}$
4) $2 < P < 3$
5) None of these

## Question of the Day #90: (22-May-09)

The question below consists of a set of labelled sentences. These sentences, when properly sequenced, form a coherent paragraph. Choose the most logical order of sentences from among the options.

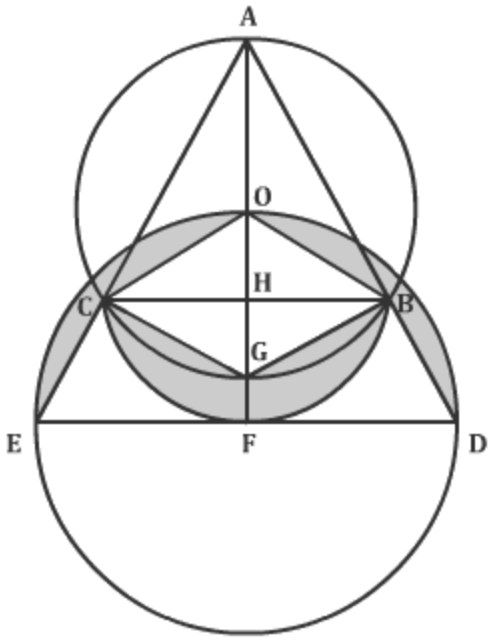
A. The nucleus is the more important of the two and, so to say, governs the life of the cell-protoplasm.
B. And for all life established in nature the cell remains the constant and unchanging form element.
C. It is composed of the most widely differing elements which, taken together, form the so-called protoplasm or cellular substance.
D. Yet even this tiny cell is already a highly organized and perfected thing.
E. It comprises the cell-protoplasm and a nucleus imbedded in it whose substance is known as the nucleoplasm.

**OPTIONS**

1) DCBEA
2) CAEDB
3) ADCEB
4) DEACB
5) EADCB

## Question of the Day #91: (23-May-09)

As shown in the figure, an equilateral triangle ABC of side '3$a$' units is circumscribed by the circle with center O. Now side AB and AC are extended to form another equilateral triangle ADE. Keeping DE as diameter, a circle with center F is drawn which will pass through O. Now keeping chord BC as a diameter, a semicircle is drawn which will touch segment DE at F. Then what will be the area of shaded region in square units? (Take π = 3)




**OPTIONS**

1) $\frac{25}{8}a^2$
2) $\frac{27}{8}a^2$
3) $\frac{25}{4}a^2$
4) $\frac{27}{4}a^2$
5) None of these

## Question of the Day #92: (24-May-09)

The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

We are very apt to regard the Gospels conventionally. An inherited orthodoxy which has made peace with the world takes them for granted as "a tale of little meaning, though the words are strong." An impatient reaction from orthodoxy sets them aside as incomprehensible or unimportant. It is worthwhile making the effort to empty our minds of prejudice, and to allow the Gospels to tell their own tale._____

**OPTIONS**

1) For, if we don't, the Gospels will find another way to tell us the tales
2) We shall find that they bring us face to face with a Portrait of surprising freshness and power.
3) For, an impatient reaction from orthodoxy setting them aside as incomprehensible or unimportant may be justified
4) Although the Gospels may actually reveal the true nature of tales
5) We shall find that they bring us face to face with a reality that may not be very easy to digest

## Question of the Day #93: (25-May-09)

What is the value of $p$?

Given:
$\alpha, \beta$ are the roots of the equation $x^2 + px + q - 2 = 0$,
$\gamma, \delta$ are the roots of the equation $x^2 - px + q - 4 = 0$,

$\frac{1}{\alpha}+\frac{1}{\beta}+\frac{1}{\gamma}+\frac{1}{\delta}=\frac{3}{8}$ and

$\alpha\beta\gamma\delta = 48$

**OPTIONS**

1) 9
2) 12
3) 16
4) 24
5) Cannot be determined

## Question of the Day #94: (26-May-09)

The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

Heat kills. A heat wave in France in 2003 caused an estimated 35,000 deaths, and a hot spell similar to the one Britain had last month caused more than 2,000 deaths, according to official estimates. Although no particular heat wave can be directly attributed to global warming, it will make such events more frequent. Moreover, if global warming continues unchecked, the number of deaths that occur when rainfall becomes more erratic, causing both prolonged droughts and severe floods, will dwarf the death toll from hot weather in Europe. More frequent intense hurricanes will kill many more. _____

**OPTIONS**

1) Tropical diseases will spread, killing still more people.
2) Overwhelmingly, the dead will be those who lack the resources to adapt, and who do not have access to health care.
3) Even in rich countries, it usually isn't the rich who die in natural disasters.
4) California has just emerged from its own record-breaking heat wave.
5) But most Americans still fail to realize that their country's refusal to sign the Kyoto protocol is a moral failing of the most serious kind.

## Question of the Day #95: (27-May-09)

If $\alpha, \beta$ are the roots of the equation $x^2 - 4x + p = 0$ and $\gamma, \delta$ are the roots of the equation $x^2 - 36x + q = 0$ and $\alpha, \beta, \gamma, \delta$ form an increasing G.P. Find the value of $(p + q)$.

**OPTIONS**

1) 198
2) 225
3) 298
4) 228
5) 246

## Question of the Day #96: (28-May-09)

The question below consists of a paragraph in which the first and last sentences are identified. Choose the option that has the most logical order of the intermediate sentences.

1. Transistors come in many different packages (chip carriers).
A. Because they are smaller and have shorter interconnections, SMDs have better high frequency characteristics.
B. The two main categories are *through-hole* (or *leaded*), and *surface-mount*, also known as **surface mount device** (SMD).
C. Transistor packages are made of glass, metal, ceramic or plastic.
D. The package often dictates the power rating and frequency characteristics.
6. However this leads to a lower power rating.

**OPTIONS**

1) ABCD
2) ACBD
3) CDBA
4) CABD
5) BCAD

## Question of the Day #97: (29-May-09)

Let $x$ and $y$ be non-negative integers such that

$$x + y = 11 \text{ and } N = \frac{11!}{x!\, y!}$$

What is the sum of all the values of N for different solution sets (x, y)?

**OPTIONS**

1) 2000
2) 2400
3) 1024
4) 2048
5) None of these

## Question of the Day #98: (30-May-09)

Answer the question based on the passage given below.

Notwithstanding the obscurity which thus envelops the date of the foundation of Vondervotteimittis, and the derivation of its name, there can be no doubt, as I said, that it has always existed as we find it at this epoch. The oldest man in the borough can remember not the slightest difference in the appearance of any portion of it; and, indeed, the very suggestion of such a possibility is considered an insult. The site of the village is in a perfectly circular valley, about a quarter of a mile in circumference, and entirely surrounded by gentle hills, over whose summit the people have never yet ventured to pass. For this they assign the very good reason that they do not believe there is anything at all on the other side.

Which of the following comes close to describing the people of Vondervotteimittis?

**OPTIONS**

1) Change is the only constant when it comes to the people and the town of Vondervotteimittis.
2) The people of Vondervotteimittis do not like adventure and thereby have not ventured to see the world beyond their city's own narrow confines.
3) The people of Vondervotteimittis are not given to variation in their life.
4) Alterations and risk are not part of the lives of people of Vondervotteimittis.

## Question of the Day #99: (31-May-09)

A question is followed by two statements, A and B. Answer the question using the following instructions:
Mark (1) if the question can be answered by using statement A alone but not by using statement B alone.
Mark (2) if the question can be answered by using statement B alone but not by using statement A alone.
Mark (3) if the question can be answered by using either of the statements alone.
Mark (4) if the question can be answered by using both the statements together but not by either of the statements alone.
Mark (5) if the question cannot be answered on the basis of the two statements.

What is the thirteenth term of the geometric progression?

A. The sixth term of the geometric progression is 4.
B. The product of the tenth term and the sixteenth term of the geometric progression is 4096.

**OPTIONS**

1) 1
2) 2
3) 3
4) 4
5) 5

## Question of the Day #100: (01-Jun-09)

The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

Drinking 500ml of beetroot juice a day can significantly reduce blood pressure, research suggests. The key beneficial ingredient appears to be nitrate, which is also found in green, leafy vegetables. The researchers found that in healthy volunteers blood pressure was reduced within an hour of drinking the juice. The study, could suggest a low-cost way to treat hypertension. _____

**OPTIONS**

1) Drinking beetroot juice, or consuming other nitrate-rich vegetables, might be a simple way to maintain a healthy cardiovascular system.
2) Previously the protective effects of vegetable-rich diets have been attributed to their antioxidant vitamin content, rather than to nitrate.
3) Beetroot juice lowers blood pressure in the short term in volunteers with normal blood pressure.
4) What we need now is research to see whether it has an effect on people with high blood pressure over a much longer period of time.
5) There is a growing body of work showing that a diet rich in fruit and vegetables had a beneficial impact on hypertension.

# SOLUTIONS

## Solution #01: (22-Feb-09)

If the green ball is placed at the 10th position from left, then the red ball can be placed to the left of the green ball in 9 ways.

If the green ball is placed at the 9th position from left, then the red ball can be placed to the left of the green ball in 8 ways.

If the green ball is placed at the 8th position from left, then the red ball can be placed to the left of the green ball in 7 ways.

Similarly, if the green ball is placed at the seventh, sixth, fifth, fourth, third and second places, then the red ball can be placed in 6, 5, 4, 3, 2, 1 ways respectively.

In all these ways, the remaining 8 balls can be arranged in (8!) ways.

∴ Total number of ways = (9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1) × (8!)

= 45 × 8!

= (9 × 5) × (8!)

= 5 × 9!

Hence, option 4.

*Alternatively*,

The total number of ways of arranging the ten balls is 10!

Out of these, in exactly half the ways, the red ball will be to the left of the green ball, and in the remaining ways, to the right of the green ball.

$$\therefore \text{The number of ways} = \frac{10!}{2} = \frac{10 \times (9!)}{2} = 5 \times 9!$$

Hence, option 4.

Discuss the solution with Testfunda users.

## Solution #02: (23-Feb-09)

Sentence B introduces something new, a heavy seawall.
That idea continues in C. The article 'the' is a definite article. Which means it is something specific. It is used to refer to things already mentioned or introduced before (because now you are definitely sure). Thus, the word seawall should be preceded by article 'the'.
In sentence D, it should be between the two piers.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #03: (24-Feb-09)

$$S_n = \left[1 - \frac{2}{n+1}\right] = \frac{n-1}{n+1}$$

$$\text{The required product} = S_2 \times S_3 \times S_4 \times \ldots \times S_{n-1} \times S_n$$

$$= \frac{1}{3} \times \frac{2}{4} \times \frac{3}{5} \times \frac{4}{6} \times \ldots \times \frac{n-2}{n} \times \frac{n-1}{n+1}$$

We can see that the numerators of all except the first two terms will cancel with the denominators of the term two places behind the current term.

$$\therefore \text{The required product} = \frac{1 \times 2}{n(n+1)}$$

$$\text{We need } \frac{2}{[n(n+1)]} < \frac{1}{100} \text{ i.e. } n(n+1) > 200$$

The least value of *n* for which this is true is 14.

Since we started with $S_2$, the number of terms that have been multiplied = 14 – 1 = 13

Hence, option 2.

Discuss the solution with Testfunda users.

## Solution #04: (25-Feb-09)

There are no errors in 1, 2, 4 and 5.
There is a grammatical error only in 3. According to the information in the sentence, the worker bees may have been sacrificing themselves, therefore in this context the phrasal verb 'giving up' should be used, which indicates the sacrifice, without it using just the verb 'giving' does not convey the exact meaning.
Hence, the correct answer is option 4.

Discuss the solution with Testfunda users.

## Solution #05: (26-Feb-09)

For $x = 1$:

$1! = 1 = k^2$

$\therefore k = \pm 1$

For $x = 2$:

$1! + 2! = 3 = k^2$ ... (Not possible, as $k \in I$)

For $x = 3$:

$1! + 2! + 3! = 9 = k^2$

$\therefore k = \pm 3$

For $x = 4$:

$1! + 2! + 3! + 4! = 33$

Similarly, the expression $1! + 2! + 3! + 4! + \ldots + x!$ always ends with 3 for $x \geq 4$.

[For example: $1! + 2! + 3! + 4! + 5! = 153$ and $1! + 2! + 3! + 4! + 5! + 6! = 873$ and so on]

$\therefore$ For $x \geq 4$, the sum can never be a square of a whole number (because a square of a whole number cannot end with 3)

$\therefore$ There are only 4 possible values of $k = \pm 1$ and $k = \pm 3$

Hence, option 2.

Discuss the solution with Testfunda users.

## Solution #06: (27-Feb-09)

The length of the sentences makes it a time consuming question.
In statement C, the word should be 'steel' to indicate the alloy instead of 'steal'.
Working with the options, both 3 and 5 have C in them.
Rest of the sentences are grammatically correct.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #07: (28-Feb-09)

When a sphere is cut into 2 pieces, two identical pieces are formed. This one of the pieces is called as 'Biggest piece'.

Out of 2 pieces, one piece is kept aside and other piece is again cut in a symmetrical manner to get two other identical pieces which have same shape as that before cutting.

Now, once again one piece is kept aside and other piece is cut in a symmetrical manner to get two other identical pieces. This one of pieces is called as 'Smallest piece'.

Let diameter of the sphere = $2a$

Now, Area of the biggest piece = Area of plane circular part + Area of the spherical part

$$= \pi a^2 + \left[\frac{1}{2} \times (4\pi a^2)\right]$$

$= 3\pi a^2$

Area of the smallest piece = (3 × Area of the plane quarter part) + Area of the spherical part

$$= \left[3 \times \frac{1}{4} \times \left(\pi a^2\right)\right] + \left[\frac{1}{8} \times \left(4\pi a^2\right)\right]$$

$$= \frac{5}{4} \times \left(\pi a^2\right)$$

$$\therefore \text{ Ratio of the surface area of the biggest piece to the smallest piece} = \frac{3\pi a^2}{\left(\frac{5\pi a^2}{4}\right)}$$

$$= \frac{12}{5} = 2.4$$

Hence, option 4.

Discuss the solution with Testfunda users.

## Solution #08: (01-Mar-09)

'Replenished, flame and flared' should be 'replenished, flamed and flared' to make the construction of sentence B parallel and balanced.
In sentence D, the word should be 'draught' (a current of cool air indoors) and not 'drought' (an extremely long period of abnormally low rainfall).
Hence, the correct answer is option 4.

Discuss the solution with Testfunda users.

## Solution #09: (02-Mar-09)

P = {2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97}

∵ There are 4 numbers which are in A.P., so maximum possible common difference between 2 and 97 can be 31.

But, the difference between odd prime numbers cannot be odd, we will check whether there is any A.P. possible or not with the difference of 30.

By trial and error, we get,

7, 37, 67, 97 are 4 numbers which are in A.P. with a difference of 30.

∴ Maximum possible common difference is 30.

Hence, option 5.

Discuss the solution with Testfunda users.

## Solution #10: (03-Mar-09)

"Prosaic" and "banal" both mean 'dull and mundane'. Any memory that is recalled more often is intense or vivid and cannot be dull or uninteresting. Therefore, we eliminate options 2, 4 and 5.
Blanks 1 and 2 refer to opposite ideas in the context of the passage.
In option 1, "extraordinary" and "intense" mean the same.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #11: (04-Mar-09)

∴ Minimum value of

we know that $a < c < e < b < d$

$$\left|\frac{(e-15)}{10}\right| \leq \frac{2}{5}$$

$$\therefore -\frac{2}{5} \leq \frac{(e-15)}{10} \leq \frac{2}{5}$$

$$\therefore -2 \leq \frac{(e-15)}{2} \leq 2$$

$$\therefore -4 \leq e-15 \leq 4$$

$$\therefore -4+15 \leq e \leq 4+15$$

$$\therefore 11 \leq e \leq 19$$

∴ $e$ can take any value from 11 to 19.

Now the maximum value for $a$ would be $\infty$ as $x > 0$ and for minimum value,

$$a = \frac{9}{x} + x$$

The product of both the terms is 9.

∴ Their sum would be minimum when they will be equal.

$$x = \frac{9}{x}$$

$$\therefore x^2 = 9$$

$$\therefore x = \pm 3$$

We would consider only positive value of $x$, ∵ $x > 0$.

$$\therefore a = \frac{9}{3} + 3$$

$$\therefore a = 6$$

Hence $a$ can take any value from 6 to $\infty$

Similarly for $d$ we get,

$\boldsymbol{d = 25 - |7 + y|}$

As value of *d* cannot be negative the minimum value *d* can have is 0 and as modulus is always positive hence the maximum value of *d* can be 25.

∴ *d* can take any value from 0 to 25.

we are also given that $a < c < e < b < d$

So as the minimum value of *a* is 6, maximum value of *d* is 25 and range of e is from 11 to 19 then we will have to reconsider the range of value of the numbers so that all the conditions hold true.

As minimum value of *d* is 0, it cannot be less than *e* and *b*, *b* is greater and minimum value of *e* is 11.

*b* is 12 and that of *d* is 13.

Maximum value of *d* is 25 hence maximum value of *b* is 24.

Similarly,

As *a* has to be smaller than *c* and *e,* maximum value of *e* is 19 and *c* is smaller than *e*.

∴ Maximum value of *c* is 18 and that of *a* is 17.
Minimum value of *a* is 6 and hence minimum value of *c* is 7.
∴ Finally, we get,

$6 \leq a \leq 17$

**$7 \leq c \leq 18$**

$11 \leq e \leq 19$

$12 \leq b \leq 24$

$13 \leq d \leq 25$

∴ The range of values of *p* is:

$6 + 7 + 11 + 12 + 13 \leq p \leq 17 + 18 + 19 + 24 + 25$

$49 \leq p \leq 103$

∴ The range of the sum is [49, 103].

Hence, option 5.

Discuss the solution with Testfunda users.

## Solution #12: (05-Mar-09)

"Disbanded" means 'dissolved or dispersed'.
Since these troops were presented in the period of war only, they were 'dissolved at the termination of hostilities' or 'disbanded upon the cessation of hostilities' makes more sense.
Therefore, options 3 and 5 can be eliminated.
Also, "prerogative" refers to 'a power or privilege restricted to sovereign figures like kings'. This eliminates option 2.
"Cessation" and "statute" are better options than "termination" and "law".
Hence, the correct answer is option 4.

Discuss the solution with Testfunda users.

## Solution #13: (06-Mar-09)

Let the height of the mountain be $d$ km.
Let $x$ km/hr be the speed of Rakesh (while climbing up) and $y$ km/hr be the speed of Rajesh.

$$\text{Time taken by Rakesh to climb up and move down the mountain} = \frac{d}{x} + \frac{d}{\left(\frac{4x}{5}\right)} = \frac{9d}{4x}$$

$$\text{Time taken by Rajesh to climb up and move down the mountain} = \frac{d}{y} + \frac{d}{y} = \frac{2d}{y}$$

$$\text{Time taken by Rakesh to climb half way up the mountain is } \frac{\left(\frac{d}{2}\right)}{x}$$

$$\therefore \frac{2d}{y} = \frac{9d}{4x} - \frac{d}{2x}$$

$$\therefore \frac{x}{y} = \frac{7}{8}$$

∴ We can write, $x = 7k$ and $y = 8k$ where '$k$' is a natural number
They both meet each other when Rakesh is moving down and Rajesh is climbing up.
Let they both meet each other at height $h$ from the ground level and let after $t$ hr from the time when they meet, both return to the starting point.
∴ For Rakesh, $h = 7k \times 4/5 \times t$ ...(i)
and for Rajesh, $(d - h) + d = 8k \times t$ ...(ii)
On solving equations (i) and (ii), we get,
$h = (14/17)d$

Hence, option 5.

Discuss the solution with Testfunda users.

## Solution #14: (07-Mar-09)

Energy is essential for plants. So, 'decrease' in energy cannot result in bulk of functioning. This eliminates option 2.
Glucose cannot 'form' the ecosystem. It can drive or regulate it. Therefore, we eliminate option 4 and 5.
"Resurrect" means 'bring back to life' which is inappropriate in blank 3.
'Regain' is appropriate usage.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #15: (08-Mar-09)

$f(x)$ is minimum when $f'(x) = 0$ and $f''(x) > 0$

$f(x) = x^2 - 6x - 1$, if $3 \le x \le 4$
$\therefore f'(x) = 2x - 6$
When $f'(x) = 0$, we get,
$2x - 6 = 0$
$\therefore x = 3$
$\therefore f'(x) = 0$ at $x = 3$

Now, $f''(x) = 2$
$\therefore f''(x)$ is positive.
When $x = 3$, $f(x) = 9 - 18 - 1 = -10$
$f(x) = -1 - x^2$ if $0 \le x < 3$
$\therefore f'(x) = -2x$

When $f'(x) = 0$, we get,
$-2x = 0$
$\therefore x = 0$
$\therefore f'(x) = 0$ at $x = 0$

Now, $f''(x) = -2$
$\therefore f''(x)$ is negative.
$\therefore f(x)$ is maximum at $x = 0$

$\therefore$ The minimum value of $f(x) = -10$
Hence, option 3.

Discuss the solution with Testfunda users.

## Solution #16: (09-Mar-09)

The tone of the passage is respectful though the author is critical of his Lordship. So, torture and persecution are extreme. Plus, the second word reject will not fit the meaning of the sentence. So, we can eliminate options 1 and 2.
"Indirection" is 'lack of awareness of direction'. The author certainly does not give any indication of being critical of his own self.
"Indignation" is 'anger at some injustice', which seems to go with the idea of forceful expressions because of anger.
If we check the other words, approve goes well for the second blank.
"Preclude" is to 'prevent' (I shall not keep away from any truths, however severe) and is the word for the last blank.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #17: (10-Mar-09)

$a + b + c + d + e + g + h + i + k = 3f + 5j$

Adding $f + j$ on both sides, we get,

$a + b + c + d + e + f + g + h + i + j + k = 4f + 6j$

But $a + b + c + d + \ldots + k$ = Sum of first 11 natural numbers = 66

$\therefore 4f + 6j = 66$

Now, '$f$' and '$j$' can take the following values (9, 5); (6, 7); (3, 9). ...[by trial and error]

$\therefore$ '$j$' cannot take the value 3. ...[When $j = 3$, $f = 12$, which is not possible]

Hence, option 4.

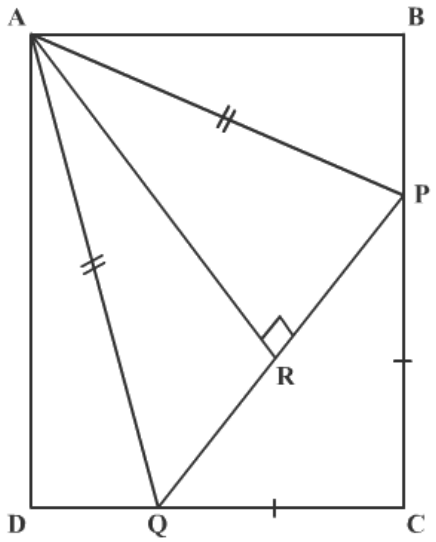
Discuss the solution with Testfunda users.

## Solution #18: (11-Mar-09)

"Didactic" is instructional and would not be a suitable adjective with recognition here.
Therefore, we can eliminate the fourth option.
"Glimmering", "complete" and "gracious", all three can be suitable adjectives. So, we can look at the second and third blank. The second element, self-consciousness is preceded by a negative word (patronizing), so, the first element should also have a word on similar lines.
"Deference" which means 'courteous respect' is a positive word. Therefore, we can eliminate option 2.
"Preponderance" which is similar in meaning to predominance does not go well with the meaning of the sentence.
In other words, dominance of familiarity does not make sense.
In option 1, "impertinence" is 'being disrespectful' (a negative word for the second blank) and "rectitude" is 'moral correctness' (a positive word which goes with 'great genius and high rectitude').
Hence, the answer is option 1.

Discuss the solution with Testfunda users.

## Solution #19: (12-Mar-09)




Refer to the figure.

Assume AP = AQ = $b$ cm and PC = CQ = $x$ cm

We have, BP = BC – PC = (10 – $x$) cm

Using the Pythagoras Theorem in ΔPCQ, we get,

$$PQ = x\sqrt{2}\text{ cm}$$

Using the Pythagoras Theorem in ΔPBA, we get,

$b^2 = 10^2 + (10 - x)^2$

Now, the height of ΔAPQ

$$AR = \sqrt{b^2 - \left(\frac{PQ}{2}\right)^2} = \sqrt{100 + (10 - x)^2 - \frac{x^2}{2}}$$

$$= \sqrt{200 + \frac{x^2}{2} - 20x} = \frac{\sqrt{[400 + x^2 - 40x]}}{\sqrt{2}} = \frac{20 - x}{\sqrt{2}}$$

$$\text{The area of } \Delta APQ = \frac{1}{2} \times PQ \times AR = \frac{1}{2} \times (x\sqrt{2}) \times \left[\frac{20 - x}{\sqrt{2}}\right] = \frac{x(20 - x)}{2}$$

∵ This is half the area of that portion of square ABCD which is not covered by ΔAPQ, the area of ΔAPQ must be one-third that of the square ABCD.

$$\therefore \frac{x(20 - x)}{2} = \frac{100}{3}$$

$$\therefore x = 10\left(1 \pm \frac{1}{\sqrt{3}}\right)$$

But, x cannot be more than 10 cm.

$$\therefore x = 10\left(1 - \frac{1}{\sqrt{3}}\right)$$

$$\text{Also, } b = \sqrt{[100 + (10 - x)^2]} = \frac{20}{\sqrt{3}} \text{ cm}$$

$$\therefore \text{The perimeter of } \Delta APQ = 2b + PQ = 2b + x\sqrt{2}$$

$$= \frac{40}{\sqrt{3}} + 10\sqrt{2}\left(1 - \frac{1}{\sqrt{3}}\right) \text{ cm}$$

Hence, option 4.

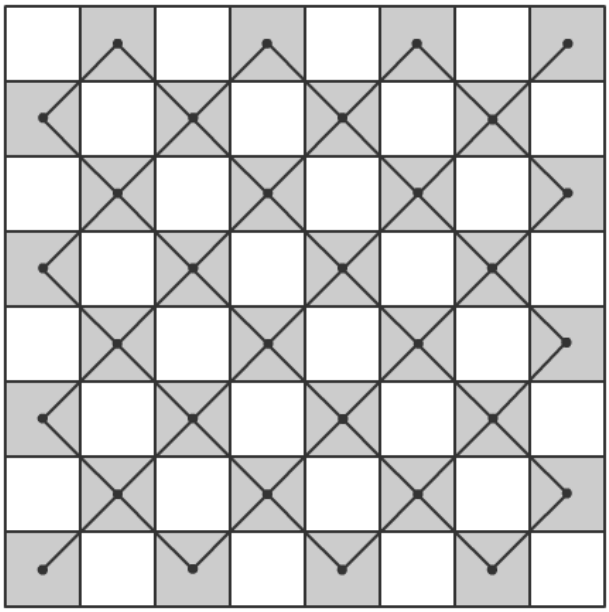
Discuss the solution with Testfunda users.

## Solution #20: (13-Mar-09)

The poet is not talking about sorrow (although he hints at it).
Option 5 talks about solemn drums. That does not go with marching drums.
Option 4 is a repetition of the the first two lines. But, the stanza has not concluded. Therefore, this one would not immediately follow.
Options 1, 2 and 3 are possibilities. With a 'not' there should be a line beginning with a 'but'.
Option 2 is the most likely here, as it goes with the rhyme and syntax, "Not with…but in…"
Hence, the correct answer is option 2.

Discuss the solution with Testfunda users.

## Solution #21: (14-Mar-09)



As shown in the figure, centres are joined such that line joining them will not lie in the white square area.

There are 14 outer points out of which 12 points, each of which is joined by two line segments and hence these 12 points result into 12 unique right angles.

Then, there are 32 – 14 = 18 points left, each point is joined by four line segments and hence these 18 points result into 18 × 4 = 72 unique right angles

∴ The total number of unique right angles = 72 + 12 = 84

Hence, option 4.

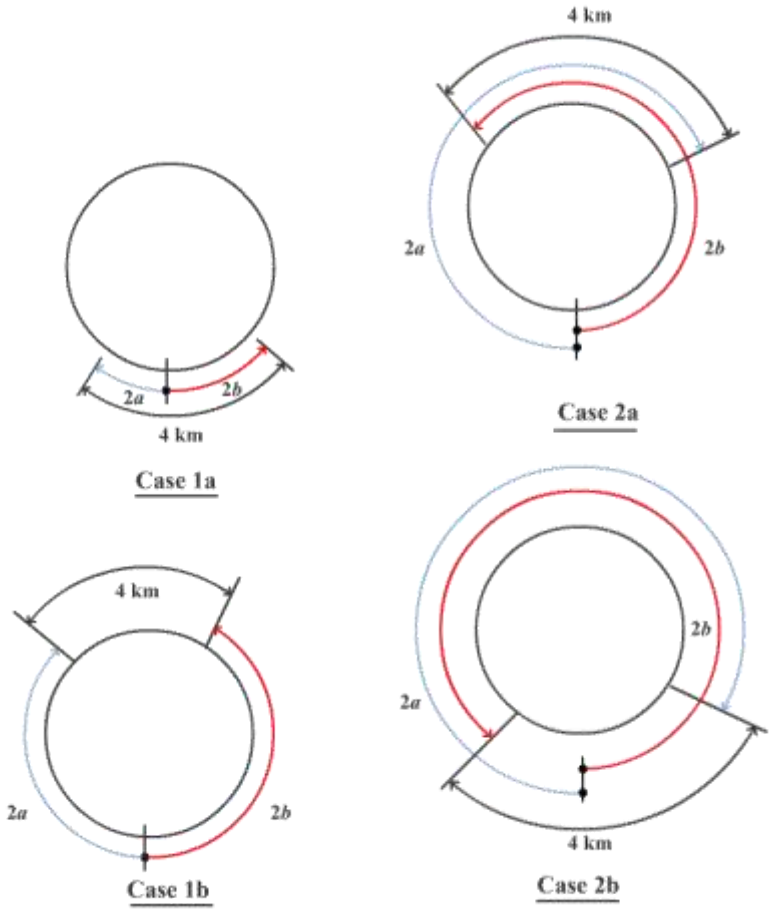
Discuss the solution with Testfunda users.

## Solution #22: (15-Mar-09)

There are several possibilities out here. The continuation of the passage could be a question. In that case, options 1 and 5 could be considered.
We can also have option 3, as the author refers to both self and substance as 'neither' in the sentence.
Option 4 perhaps may fit as it has hints of answering the question asked in the passage.
But, the best answer is option 2. It uses the reference word 'it' (which refers to the question), saying, 'if that (it) were the case…' Then, it continues the concept by stating, 'how can **that** question have place…'
Hence, the correct answer is option 2.

Discuss the solution with Testfunda users.

## Solution #23: (16-Mar-09)




Let $a$ and $b$ be the speeds of Asmita and Babita respectively.

∴ The distances covered by them after 2 hours will be $2a$ and $2b$ respectively.

Now, both of them may or may not cross each other during the two hours that they run.

Case 1: Asmita and Babita do not cross each other

∵ The track is circular, when we say that the distance between Asmita and Babita is 4 km, 2 cases arise.

Case 1a: $2a + 2b = 4$

$\therefore a + b = 2$

Case 1b: $2a + 2b + 4 = 10$

$\therefore a + b = 3$

Case 2: Asmita and Babita cross each other

Now again, since the track is circular, two cases arise.

Case 2a: $2a + 2b - 4 = 10$

$\therefore a + b = 7$

Case 2b: $2a + 2b - 6 = 10$

$\therefore a + b = 8$

Options 1 and 2 are possible in case 1b. Option 3 is possible in case 2b and option 5 is possible in case 2a.

However, option 4 gives $a + b = 4 + 2 = 6$, which is not possible.

Hence, option 4.

Discuss the solution with Testfunda users.

## Solution #24: (17-Mar-09)

This may need some explanation. First, try to define the direction and the tone of the paragraph.
A simple query to a head hunter; her answer stuns him, probably making him realize something quite true about the whole affair.
Option 1 requires quite a lot of clarification about cowboy capitalism.
Option 3 is inappropriate about bail out.
Option 4 shows indifference. This is out of context with regards to the tone of the paragraph.
ption 2 shows the realization and brings the whole paragraph to a smooth closure.
Hence the correct answer is option 2.

Discuss the solution with Testfunda users.

## Solution #25: (18-Mar-09)

Let there be $n$ inlet pipes. So, there are $(16 - n)$ outlet pipes.
Each inlet pipe can fill the tank in 6 hours.

$\therefore$ In 1 hour, each inlet pipe fills $\left(\frac{1}{6}\right)^{th}$ of the tank.

$\therefore$ $n$ pipes will fill $\left(\frac{n}{6}\right)^{th}$ of the tank.

$\therefore$ In 1 hour, each outlet drains $\left(\frac{1}{8}\right)^{th}$ of the tank.

$\therefore$ $(16-n)$ pipes will drain $\left[\frac{16-n}{8}\right]^{th}$ of the tank in an hour.

$\because$ It takes 24 hours for the tank to get filled.

$\therefore$ In 1 hour, $\left(\frac{1}{24}\right)^{th}$ of the tank gets filled.

$$\therefore \left(\frac{n}{6}\right) - \left[\frac{16-n}{8}\right] = \frac{1}{24}$$

$$\therefore \frac{(4n - 48 + 3n)}{24} = \frac{1}{24}$$

$\therefore 7n - 48 = 1$
$\therefore 7n = 49$
$\therefore n = 7$
$\therefore$ Number of Inlet pipes = 7
$\therefore$ Number of outlet pipes = 16 – 7 = 9
Hence, option 5.

Discuss the solution with Testfunda users.

## Solution #26: (19-Mar-09)

It is mandatory that statement B will follow statement A, therefore options 3 and 5 are eliminated.
Statement C will logically be the first sentence because statement 1 asks about a period and the statement C answers it; "any determinate period". Therefore, the first sentence will be statement C.
Statement A will logically follow statement C since it answers the question in C - for whom was the written Iliad necessary. Thus, options 1 and 2 are eliminated.
Hence, the correct answer is option 4.

Discuss the solution with Testfunda users.

## Solution #27: (20-Mar-09)

The number of roots of an equation = order of the equation

Also the roots of the equation can be positive, negative, or complex numbers or a combination of these. When the co-efficients of the equation are not complex, the roots could be complex and would occur in conjugate pairs. However if the co-efficients of the equation themselves are complex, then the roots may or may not occur in conjugate pairs.

For example, the roots of the equation $[x^2 - (3 - i)x - 3i = 0]$ are $x = 3$ and $x = i$ and the roots of the equation $[x^2 + 4x + 5 = 0]$ are $x = (-4 \pm 2i)/2$

Now, using the above logic, statement A and statement B alone are not sufficient to answer the question.

From both the statements A and B together, we can conclude that $f(x)$ has 43 non negative real roots and the remaining 57 roots would be either negative real roots or complex conjugate roots. As none of the co-efficients are complex, hence even if complex roots would occur, they would occur in conjugate pairs, i.e. the number of complex roots, if present, will be even in number.

Thus, the number of negative real roots has to be odd. (Also the number of negative real roots cannot be zero - atleast one needs to be present).

∴ The question can be answered using both the statements together.

Hence, option 4.

Discuss the solution with Testfunda users.

## Solution #28: (21-Mar-09)

Statement C introduces 'General' and statement D describes him further. So the CD link is established.
Statement C says that General is waiting. Statement E follows statement D as it speaks about the animals that have come now. This is stated in the phrase 'before long'.
Statement E ends with 'different fashions'. The phrase indicates that the next sentence would describe those fashions. Statement B follows statement E, because it describes how the animals settled in their fashion.
Statement A comes last because it describes how the other animals settled. It is a continuation of the idea expressed in statement B.
One is likely to assume that the first sentence should be statement E, because it introduces the entry of the animals. But the phrase 'before long' indicates that someone did not have to wait long before they came. The phrase, 'General had already settled' indicates that General is lying there and is the first to enter.
Hence, the correct answer is option 1.

Discuss the solution with Testfunda users.

## Solution #29: (22-Mar-09)

$$\because \frac{1}{2^n+1}+\frac{1}{2^n+2}+\frac{1}{2^n+3}+\cdots+\text{upto } \infty=\frac{1}{2^n}$$

$$\therefore \frac{1}{4}+\frac{1}{8}+\frac{1}{16}+\cdots+\text{upto } \infty=\frac{1}{2} \qquad \ldots(\text{i})$$

$$\frac{1}{8}+\frac{1}{16}+\frac{1}{32}+\cdots+\text{ upto } \infty=\frac{1}{4} \qquad \ldots(\text{ii})$$

$$\frac{1}{16}+\frac{1}{32}+\frac{1}{64}+\cdots+\text{upto } \infty=\frac{1}{8} \qquad \ldots(\text{iii})$$

And so on ...
Adding equations (i), (ii), (iii) and so on, we get,

$$\frac{1}{4}+\frac{2}{8}+\frac{3}{16}+\frac{4}{32}+\cdots+\text{upto } \infty=\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+\cdots+\text{upto } \infty$$

$$\therefore \frac{1}{4}+\left(\frac{2}{8}-\frac{1}{8}\right)+\left(\frac{3}{16}-\frac{1}{16}\right)+\left(\frac{4}{32}-\frac{1}{32}\right)+\cdots+\text{upto } \infty=\frac{1}{2}+\frac{1}{4}$$

$$\therefore \frac{1}{4}+\frac{1}{8}+\frac{2}{16}+\frac{3}{32}+\cdots+\text{upto } \infty=\frac{3}{4}$$

Hence, option 2.

Discuss the solution with Testfunda users.

## Solution #30: (23-Mar-09)

To make the prediction that "China, Brazil and India will eventually overtake western countries" in the number of web users true, it is necessary that these countries should have greater number of users ( in the future) than in the western countries.
Option 1 does not ensure that web users will be more.
Option 2 does not mention web users- but refers to the use of computers. They may be used for other purposes than the web.
Option 4 is incorrect because one needs to further link computer literacy and web use.
Option 5 is not the answer because it does not state that at the same time web users will increase or remain the same in China, Brazil and India.
Option 3 states the assumption that China, India, and Brazil have greater number of potential users than in the western countries, which will help them overtake the western countries in the future.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #31: (24-Mar-09)

$f(x, y) = x^2y^2 - 4x^2y + 4x^2 - 2xy^2 + 8xy - 8x + y^2 - 4y + 7$

$\therefore f(x, y) = (x^2y^2 - 4x^2y + 4x^2) + (-2xy^2 + 8xy - 8x) + (y^2 - 4y + 4) + 3$

$\therefore f(x, y) = x^2(y^2 - 4y + 4) - 2x(y^2 - 4y + 4) + (y^2 - 4y + 4) + 3$

$\therefore f(x, y) = (x^2 - 2x + 1)(y^2 - 4y + 4) + 3$

$\therefore f(x, y) = (x - 1)^2(y - 2)^2 + 3$

It can be seen from this final expression that $f(x, y)$ is always positive, and that its least value occurs when one of $(x - 1) = 0$ or $(y - 2) = 0$.

This least value = 0 + 3 = 3

Hence, option 4.

Discuss the solution with Testfunda users.

## Solution #32: (25-Mar-09)

Option 1 is a possibility which cannot be validly concluded. It may or may not happen. Data is insufficient to make it a logical necessity.
Option 2 is true only if the Antarctic bird referred to is limited to "Emperor penguins". There may be Antarctic birds that may adapt faster in which case 95% decline may not be supported. The generalisation cannot be said to be valid.
Option 4 is a possible- though not valid- generalisation about aquatic birds. The passage is referring to penguins in particular and not all aquatic birds.
Option 5 may also be true but cannot be concluded with any great degree of certainty on the basis of the given data about Emperor penguins. We cannot deduce with certainty that Emperor penguins are the species that is drawing attention to the crisis in the Antarctic.
Option 3 is supported by every piece of data given in the paragraph. The ice does play a major role in the overall breeding success of Emperor penguins since the passage mentions that they breed during the harsh, Antarctic winters and the extent of sea ice influences the abundance of krill and fish that are its food source.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #33: (26-Mar-09)

$$\text{Let A} = 101^6 - 100^6$$

$$= (101^2 - 100^2)[101^4 + 100^4 + (101^2 \times 100^2)]$$

$$\text{Let B} = \frac{101^8 - 100^8}{(101^2 + 100^2)}$$

$$= \frac{(101^4 - 100^4)(101^4 + 100^4)}{(101^2 + 100^2)}$$

$$= \frac{(101^2 - 100^2)(101^2 + 100^2)(101^4 + 100^4)}{(101^2 + 100^2)}$$

$$= (101^2 - 100^2)(101^4 + 100^4)$$

$$\therefore \text{A} - \text{B} = (101^2 - 100^2)[101^4 + 100^4 + (101^2 \times 100^2) - 101^4 - 100^4]$$

$$= (101^2 - 100^2)(101^2 \times 100^2)$$

$$= (101 + 100)(101 - 100) \times 101^2 \times 100^2$$

$$\approx 201 \times 10^8$$

This is a 11 digit number.

Hence, option 2.

Discuss the solution with Testfunda users.

## Solution #34: (27-Mar-09)

The study links the yield to names and "personal touch". If this link is shown to be suspicious the conclusion of the study gets weakened.
Options 1 and 2 are irrelevant as they do not answer the question stem. The link between naming cows and yields is not established in any of these options.
Option 3 contradicts the passage since cows with names give a higher yield.
Option 4 does not answer the question stem and does not weaken the conclusion of the study in any way.
Option 5 brings in the factor of breed which could have caused the higher yield. All the cows with names belonged to a breed known for higher yield making the conclusion suspect and weakening it.
Hence, the correct answer is option 5.

Discuss the solution with Testfunda users.

## Solution #35: (28-Mar-09)

We need to find integral solutions for $x^2|y| - 10x|y| = -9$
$\therefore |y| \times (x^2 - 10x) = -9$
Now, the ways to factorize −9 into integers are: $1 \times (-9)$, $(-1) \times 9$ and $(-3) \times 3$.
∴ The first term $|y|$ and the second term $(x^2 - 10x)$ must take on these values in turn. Thus we have six cases.

Case 1: $|y| = 1$ and $(x^2 - 10x) = -9$
This gives 2 values for $y$ as +1 and −1. We then have to solve $x^2 - 10x + 9 = 0$
This gives $x = 9$ and $x = 1$ as the two solutions.
We have got 4 solution sets from this case: (9, 1), (9, −1), (1, 1) and (1, −1).

Case 2: $|y| = -9$ and $(x^2 - 10x) = 1$
∵ $|y|$ cannot be negative.
∴ We reject this case.

Case 3: $|y| = -1$ and $(x^2 - 10x) = 9$
∵ $|y|$ cannot be negative.
∴ We reject this case.

Case 4: $|y| = 9$ and $(x^2 - 10x) = -1$
This gives 2 values for $y$ as +9 and −9. We then have to solve $x^2 - 10x + 1 = 0$
This does not give an integral solution for $x$. So this case does not give us a valid solution set.

Case 5: $|y| = -3$ and $(x^2 - 10x) = 3$
∵ $|y|$ cannot be negative.
∴ We reject this case.

Case 6: $|y| = 3$ and $(x^2 - 10x) = -3$
This gives 2 values for $y$ as +3 and −3. We then have to solve $x^2 - 10x + 3 = 0$
This does not give an integral solution for $x$. So this case does not give us a valid solution set.
∴ The total number of solution sets are just those we got from case 1. They are 4 in number.
Hence, option 3.

Discuss the solution with Testfunda users.

## Solution #36: (29-Mar-09)

The paragraph states that the bronchus has a great ability to fight the bacteria and viruses that are breathed in. A new bronchus is not accepted by the person if transplanted and creates immunological conflicts leading to the recipient's death. Doctors would let a patient live with a weak bronchus (without attempting transplant) because the transplant is more likely to cause death than the weak bronchus itself.
Option 2 does not explain why transplants are avoided.
Option 3 contradicts the paragraph which states that bronchus transplants are easier than heart transplants.
Option 4 is related to heart and not the bronchus.
Option 5 talks about surgery and not transplants.
Hence, the correct answer is option 1.

Discuss the solution with Testfunda users.

## Solution #37: (30-Mar-09)

Let the two-digit number be of the form of $xy$, where $x$ is the ten's digit and $y$ is the unit's digit.
The value of this number is $(10x + y)$.
The number formed on reversing its digits is of the form of $yx$. Its value is $(10y + x)$.
The difference between these numbers = $9|x - y|$
We need this to be a perfect square.
$\therefore 9|x - y| = 0, 1, 4, 9, 16, 25, 36, 49, 64$ or $81$

The perfect squares greater than 81 are ruled out because $|x - y|$ cannot be greater than 9.
We can also rule out 1, 4, 16, 25, 49 and 64 since $|x - y|$ must be an integer.
So, there are only 4 numbers 0, 9, 36, 81 remaining.

The number of 2 digit numbers for which $9|x - y| = 0$, i.e. $x = y$, comes out to be 9.
These numbers are 11, 22, ..., 99.

The number of 2 digit numbers for which $9|x - y| = 9$, i.e. $|x - y| = 1$, is calculated as follows:
For every value of $x$ from 1 to 8, there will be two values of $y$ such that $|x - y| = 1$
For example, for $x = 1$, we have 10 and 12. But for $x = 9$ we have only 98.
$\therefore$ The number of 2 digit numbers for which $|x - y| = 1$ is (twice the number of allowed values of $x$) $- 1$

$$= 2 \times 9 - 1$$
$$= 17$$

The number of 2 digit numbers for which $9|x - y| = 36$, i.e. $|x - y| = 4$ is calculated as follows:
For $x = 1$ to 3 and 6 to 9, there will only be one value of $y$ for which $|x - y| = 4$.
For $x = 4$ and 5, there will be two values of $y$ each (giving the numbers 40, 48, 51 and 59).
$\therefore$ The total number of numbers for which $|x - y| = 4$ is $7 + 2 + 2 = 11$

There is only one 2 digit number for which $9|x - y| = 81$ and it is 90.

$\therefore$ The total number of 2 digit numbers satisfying our criteria is $(9 + 17 + 11 + 1) = 38$

Hence, option 4.

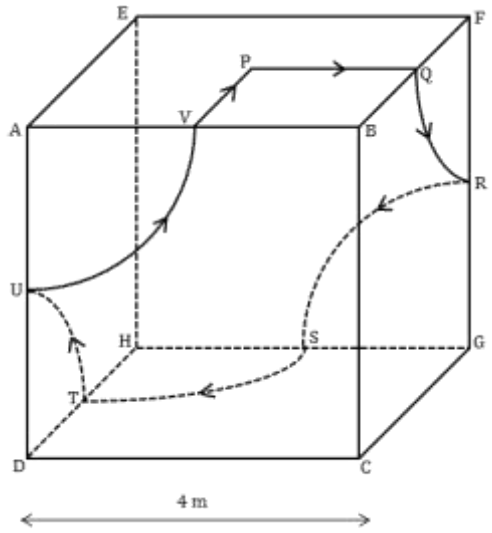
Discuss the solution with Testfunda users.

## Solution #38: (31-Mar-09)

An inference is an outcome that can be derived from the data and is convincingly supported by the data. None of the given statements can be convincingly derived from the paragraph.
Option 1 is eliminated because of "most preferred". No comparison is available from the data.
Option 2 is eliminated because of 'most effective'. The passage is silent on advertising.
Unless we have figures for all the previous years we cannot infer that in 2008, TV viewing reached a "record high," as mentioned in option 3.
Option 4 is incorrect because there is no data available in the paragraph about live TV viewership as stated in the option.
Hence, the correct answer is option 5.

Discuss the solution with Testfunda users.

## Solution #39: (01-Apr-09)




Refer to the figure.
At starting position i.e. at point P, ant moves along PQ.

Due to poisonous material whose effect is spread around 2 m, ant has to move along the arcs as shown in the figure for the minimum distance to be traveled so that ant can pass through all the faces of the cube.

∴ The minimum distance which the ant must travel through all the faces of the cube

= PQ + length(arc QR) + length(arc RS) + length(arc ST) + length(arc TU) + length(arc UV) + VP

$$= 2 + \left(5 \times \frac{2\pi(2)}{4}\right) + 2$$

= (5π + 4) m

Hence, option 1.

Discuss the solution with Testfunda users.

## Solution #40: (02-Apr-09)

Option 1 does not necessarily lead to the failure of the campaign. Even if the fact in option 1 is true the campaign can be a success and help bring tourists to the country.
Option 2 does not address the issue of the campaign.
Option 3 does not mention the campaign built around the film.
Option 5 fails to mention how this will affect the campaign.
Option 4, though in a general way, states that the success of the film determines the success of the campaign. Since the film has failed the campaign cannot succeed.
Hence, the correct answer is option 4.

Discuss the solution with Testfunda users.

## Solution #41: (03-Apr-09)

The second equation $x^2 - 3x + 2 = 0$ has only 2 roots. For the 2 equations to share 2 roots, both roots of this equation must be roots of the 1st equation.

Now, the roots of the 2nd equation can easily be found to be 1 and 2.

Calling the first equation $f(x) = 0$, we can see that $f(1)$ and $f(2)$ must both be zero, since 1 and 2 are roots of this equation as well.

Now, $f(1) = a^2 + a^2(a - 4) + (24 + 6a^2 - 3a^3) + (3a^3 - 4a^2 - 10a - 48) + (24 + a^2 + 20a - b) = a^3 + 10a - b = 0$

$\therefore b = a^3 + 10a$

And $f(2) = 16a^2 + 8a^2(a - 4) + 4(24 + 6a^2 - 3a^3) + 2(3a^3 - 4a^2 - 10a - 48) + (24 + a^2 + 20a - b) = 2a^3 + a^2 + 24 - b = 0$

$\therefore b = 2a^3 + a^2 + 24$

Equating the 2 values of $b$ in terms of $a$, we get,

$a^3 + 10a = 2a^3 + a^2 + 24$

$\therefore a^3 + a^2 - 10a + 24 = 0$

By substituting the values of $a$ given in options into this equation, we find that none of the values of $a$ satisfy the equation.

Hence, option 5.

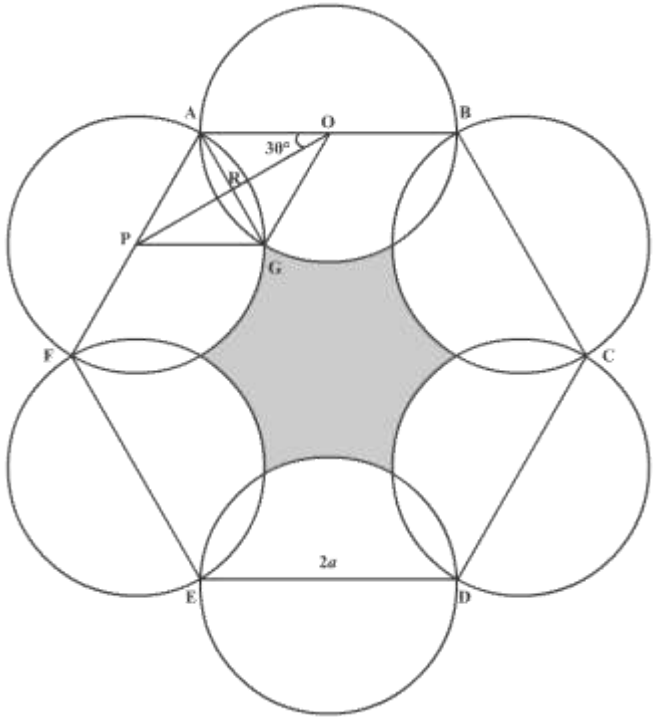
Discuss the solution with Testfunda users.

## Solution #42: (04-Apr-09)

Option 1 is incorrect because embryonic stem cell research being disapproved on 'scientific and ethical grounds' is incorrect. The American government disapproves it only on 'ethical grounds'.
Option 2 is incorrect because the paragraph refers particularly to "embryonic" stem cell research and not stem cell research in general.
Option 3 is eliminated because the paragraph talks about the *potential* to destroy human life, whereas option 3 makes it categorical by stating that it 'includes destruction of human life'.
Option 5 mentions stem cell research in general whereas the paragraph is about "embryonic" stem cell research.
Option 4 comes closest to capturing the essence of the paragraph without distorting it.
Hence, the correct answer is option 4.

Discuss the solution with Testfunda users.

## Solution #43: (05-Apr-09)




Area of shaded region = Area of hexagon ABCDEF − (6 × Area of semicircle) + (6 × Area of AGA)

[Here, Area of AGA is the area common to circles centred at P and O]

$$\text{Area of hexagon ABCDEF} = 6\sqrt{3}a^2$$

$$\text{Area of semicircle} = \frac{\pi a^2}{2}$$

Area of AGA = Area of sector APGA + Area of sector OAGO − Area of quadrilateral AOGP

Area of AGA = 2 × Area of sector OAGO − Area of quadrilateral AOGP

As all sides of quadrilateral APGO are equal and opposite sides are parallel, APGO is a rhombus.

m ∠PAO = 120° [as the sum of internal angles of hexagon ABCDEF is (6 − 2) × 180 = 720°]
∴ m ∠GAO = 60°
∴ m ∠AOP = 30°
∴ m ∠AOG = 60°

AO = $a$

In ΔAOR,

$$\text{AR} = \frac{1}{2} \times a = \frac{a}{2}$$

$$\text{OR} = \frac{\sqrt{3}}{2} \times a$$

$$\therefore \text{Area of AOGP} = \frac{1}{2} \times \text{OP} \times \text{AG}$$

∴ Area of AOGP = 2 × OR × AR (∵ AG = 2AR and OP = 2OR)

$$\therefore \text{Area of AOGP} = 2 \times \frac{\sqrt{3}}{2} \times a \times \frac{a}{2} = \frac{\sqrt{3}}{2} a^2$$

$$\text{Area of sector OAGO} = \frac{60}{360} \times \pi a^2 = \frac{\pi}{6} a^2$$

$$\therefore \text{Area of AGA} = 2 \times \frac{\pi}{6} a^2 - \frac{\sqrt{3}}{2} a^2$$

$$\therefore \text{Area of AGA} = a^2 \left( \frac{\pi}{3} - \frac{\sqrt{3}}{2} \right)$$

$$\therefore \text{Area of shaded region} = 6\sqrt{3} a^2 - 6 \times \frac{\pi a^2}{2} + 6 \times a^2 \left( \frac{\pi}{3} - \frac{\sqrt{3}}{2} \right)$$

$$\therefore \text{Area of shaded region} = \left(3\sqrt{3} - \pi\right) a^2$$

Hence, option 2.

Discuss the solution with Testfunda users.

## Solution #44: (06-Apr-09)

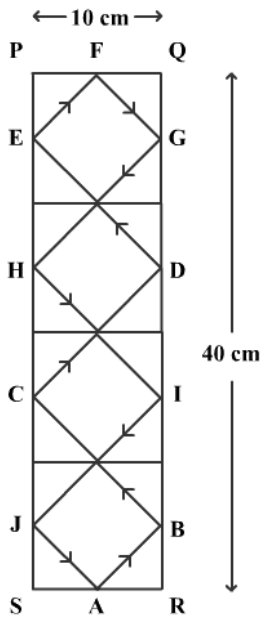
The main points of the paragraph are:

1. Palaeontologists and *other* historical scientists form a set of hypotheses about the causes of past phenomena and look for evidence to prove their hypotheses. Evidence is sometimes even accidentally obtained.
2. This is different from the way experimental scientists work. They try to disprove hypotheses until they reach one they can't disprove. It stands until someone else proves this wrong.
3. Experimental scientists resort to the method of the historical scientists when confronted by an unexpected phenomenon.

Option 1 does not use the word 'palaeontologists', while the other options do.
"Through the discovery of a 'smoking gun'" makes option 5 incorrect - there can be other ways as well.
"First look for the smoking gun" makes option 3 incorrect.
Between options 2 and 4, 2 has the word *'like'* while 4 has 'other' - other is better. Also, the second sentence does not correctly portray the essence of the second half of the paragraph. Hence, option 4 best covers the points. While, it does not cover point 2 above, there are no inaccuracies in the option.
Hence, the correct answer is option 4.

Discuss the solution with Testfunda users.

## Solution #45: (07-Apr-09)




The path of the ball is shown in the figure. The path is ABCDEFGHIJA ...

It is seen that, on every circuit of the path, the ball hits QR 4 times.

The total length of the circuit = AB + BC + CD + DE + EF + FG + GH + HI + IJ + JA

$$= 5\sqrt{2} + 10\sqrt{2} + 10\sqrt{2} + 10\sqrt{2} + 5\sqrt{2} + 5\sqrt{2} + 10\sqrt{2} + 10\sqrt{2} + 10\sqrt{2} + 5\sqrt{2}$$

$$= 80\sqrt{2} \text{ cm}$$

After 90 runs of the circuit, the ball would have travelled $7200\sqrt{2}$cm and would have hit QR 360 times. It would have to travel $5\sqrt{2}$cm more to hit QR the 361st time.

$\therefore$ The total distance travelled by it would be $7205\sqrt{2}$ cm.

We can also observe that the speed of the ball is $\sqrt{2}$ cm/sec.

$\therefore$ The time taken by it $= \frac{7205\sqrt{2}}{\sqrt{2}} = 7205$ sec

$\because$ 7200 seconds make up 2 hours, the time taken is greater than 2 hours.

Hence, option 5.

Discuss the solution with Testfunda users.

## Solution #46: (08-Apr-09)

Options 4 and 5 may be eliminated because though they are linked in some ways with the paragraph, they do not directly form a link with the penultimate statement of the paragraph, which mentions the beetles' inability “to fly”. The other options continue the theme of ‘less disposed to fly’ at some length.
In the paragraph, a particular class, *Coleoptera* has been mentioned. Options 2 mentions the entire genera, whereas, option 1 gives the reasons for the beetles' being “less disposed to fly than other *endopterygote* insects”.
Option 3 goes beyond that idea and brings in the idea of ‘complete metamorphosis’ which does not form an effective link with the penultimate statement of the paragraph.
Option 1 comes closest to explaining as to why the beetles are “less disposed to fly,” i.e. ‘their heavily armoured bodies’ and their ‘shield-like forewings’ renders them ineffective for flight.
Hence, the correct answer is option 1.

Discuss the solution with Testfunda users.

## Solution #47: (09- Apr -09)

The sum of two digits can be 1 in 2 ways - 10 or 01. Out of these, 01 is not allowed for the first two digits. Thus, the sum can be 1 for both the first two and the last two digits, in $1 \times 2$ ways (i.e. 1001 and 1010).

Similarly, the sum of both pairs of digits can be 2 in $2 \times 3$ ways (1102, 1120, 1111, 2002, 2020, 2011) and so on, till we have the sum as 9 for which there are $9 \times 10$ ways.

Now, the sum of 2 digits can be 10 in 9 ways (19, 28, ..., 91). Thus, we have 9 ways on both sides, and hence $9 \times 9$ numbers can be formed.

Similarly, the sum of both pairs of digits can be 11 in $8 \times 8$ ways, 12 in $7 \times 7$ ways, and so on, upto 18, which can be in $1 \times 1$ way.

$\therefore$ The total number is $(1 \times 2) + (2 \times 3) + (3 \times 4) + (4 \times 5) + ... + (9 \times 10) = 330$ and $(9 \times 9) + (8 \times 8) + (7 \times 7) + ... + (1 \times 1) = 285$

$\therefore$ The total number of four digit numbers which can be formed according to the conditions = $330 + 285 = 615$

Hence, option 1.

Discuss the solution with Testfunda users.

## Solution #48: (10-Apr-09)

We can work out the answer to this question by eliminating options. The paragraph mentions self renewal and how it cannot be kept up forever. It is not mentioning 'individuals'.
With this in mind we can safely eliminate option 3 and 5, since they mention 'individuals'.
Option 1 looks more like a direct continuation of option 5 than the paragraph. It also brings in the idea of new forms or species coming 'into being', which is a new element that cannot be inferred or deduced from the paragraph. We can safely eliminate option 1 as well.
Option 4 can be eliminated because the author has not mentioned any kind of life forms. So, logically, continuation with '**other life** forms' is incorrect.
Option 2 continues the idea of the process of life not being "kept up indefinitely" by stating that 'the creature is not equal to the task of indefinite *or continuous* self-renewal'.
Hence, the correct answer is option 2.

Discuss the solution with Testfunda users.

## Solution #49: (11-Apr-09)

∵ The number is of the type where the same digit is repeated a large number of times, we have to search for a multiple of 7 among such numbers.
Note that, 1001 = 143 × 7, and therefore, 111111 = 100100 + 10010 + 1001 = 14300 × 7 + 1430 × 7 + 143 × 7, i.e. 111111 is a multiple of 7

∴ 222222, 333333, etc. are all multiples of 7.
Now, our given number is the sum of 222222 followed by 95 zeroes and 222222 followed by 89 zeroes and so on.

∴ We can write it as $222222 \times (10^{95} + 10^{89} + 10^{83} + ... + 10^{53}) + 22y33 \times (10^{48}) + 333333 \times (10^{42} + 10^{36} + 10^{30} + ... + 1)$

∵ 222222 and 333333 are multiples of 7, our problem reduces to determining $y$ when $22y33$ is a multiple of 7.

Now, since 21000 is a multiple of 7, therefore $22y33 - 21000 = 1y33$ is a multiple of 7.

∴ $1y33 + 7 = 1y40$ is a multiple of 7, and so $1y4$ is a multiple of 7.

Now, we can try numbers such as 104, 114, 124, ... and we see that 154 is a multiple of 7.

∴ $y = 5$
Hence, option 4.

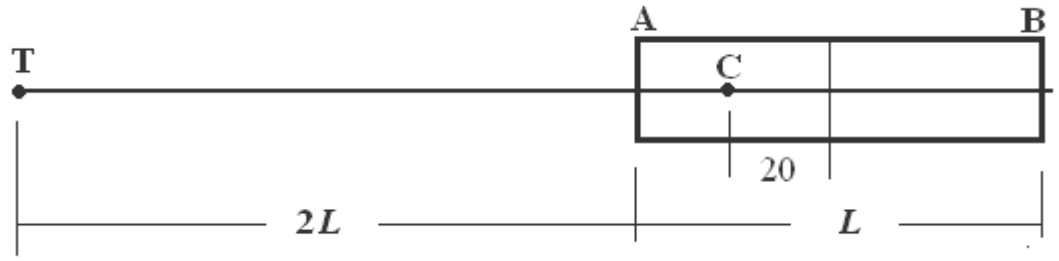
Discuss the solution with Testfunda users.

## Solution #50: (12-Apr-09)

The main points of the paragraph are:
1. Zorastrianism and Mazdaism are synonymous.
2. It is a religion and philosophy of Zarathustra.
3. It was prevalent among the Iranian tribes.
4. Islam caused it to decline.
5. Now its adherents are limited to a few (concentrations) in India, Iran and Pakistan.
The word 'dominated' eliminates option 1.
Option 2 omits certain important details- chiefly concentrations in India, Iran and Pakistan.
Option 3 omits the important points about Mazdaism and how it was widespread among Iranian tribes.
Option 4 omits important points- namely how it was widespread among Iranian tribes as well as how the religion is synonymous with Mazdaism.
Hence, the correct answer is option 5.

Discuss the solution with Testfunda users.

## Solution #51: (13-Apr-09)




Refer the diagram, here AB is the bridge, point C denotes the cat and point T denotes the train.

Let the length of the bridge be $L$ m and the speed of the cat be $S$ m/s.

The speed of the train = 72 km/hr = 20 m/s

$$\text{The initial distance of the cat from point A} = \left(\frac{L}{2} - 20\right) \text{m}$$

If the cat runs towards the train with constant speed, then it will reach the end of the bridge when the train is still 50 m away.

∴ The cat has reached the end of the bridge in the same time in which the train has

$$\text{covered } (2L - 50) \text{ m and the cat has covered } \left(\frac{L}{2} - 20\right) \text{m.}$$

$$\therefore \frac{\frac{L}{2} - 20}{S} = \frac{2L - 50}{20}$$

∴ $(10L - 400) = S \times (2L - 50)$ ...(i)

If the cat runs away from the train with constant speed, the train will hit it while it is 12.5 m from B.

∴ The distance travelled by the cat in this time

$$= \left[L - 12.5 - \left(\frac{L}{2} - 20\right)\right] = \left(\frac{L}{2} + 7.5\right) \text{ m}$$

And, the distance travelled by the train in the same time is $(2L + L - 12.5) = (3L - 12.5)$ m

$$\therefore \frac{\frac{L}{2} + 7.5}{S} = \frac{3L - 12.5}{20}$$

∴ $(10L + 150) = S \times (3L - 12.5)$ ...(ii)

Solving equations (i) and (ii) simultaneously, we get,

$L$ = 100 m and $S$ = 4 m/s

Now, we need to find the range of values of $x$, the initial position of the man for which he will be safe if he runs towards the train. The lower limit of $x$ is obviously 0 and for the upper limit, we note that it will occur only when the man and the train reach the point A at the same time.

$$\text{The train will reach point A in } \frac{2L}{20} = \frac{200}{20} = 10 \text{ s}$$

$$\text{And, the man will reach point A in } \frac{x}{4} \text{ s}$$

$$\therefore \frac{x}{4} = 10 \text{ or } x = 40 \text{ m}$$

∴ Range of the values of $x$ is from 0 to 40 m.

Hence, option 3.

Discuss the solution with Testfunda users.

## Solution #52: (14-Apr-09)

The essence of the paragraph is:
In *The Birth of Tragedy* Nietzsche presented his theory of dualism in art. Any work of art contained identity and the dissolution of identity ("art of sculpture" and "art of music"). This dualism can be compared to the two Greek Gods Apollo and Dionysius.
Option 1 does not make this dualism clear.
Options 3 and 5 do not mention the Apollonian and the Dionysian experiences.
Option 4 omits the reference to art.
Option 2 gives the essence of the paragraph in a clear and succinct manner.
Hence, the correct answer is option 2.

Discuss the solution with Testfunda users.

## Solution #53: (15-Apr-09)

Consider,

$$\therefore x = 27(\log_y 25 + \log_y 10) - 9\log_y 8$$

$$\therefore x = 27(\log_y 25 + \log_y 10) - 9\log_y 2^3$$

$$\therefore x = 27(\log_y 25 + \log_y 10) - 27\log_y 2$$

$$\therefore x = 27(\log_y 25 + \log_y 10 - \log_y 2)$$

$$\therefore x = 27\left[\log_y (25 \times 10 \div 2)\right]$$

$$\therefore x = 27\left[\log_y (125)\right] = 27\left[\log_y (5^3)\right]$$

$$\therefore x = 81\log_y (5) \qquad \ldots (i)$$

$$12(\log_5 y)^2 - x - 54\log_5 y = (\log_5 y)^3 - 108$$

Now, consider

$$12(\log_5 y)^2 - 81\log_y (5) - 54\log_5 y = (\log_5 y)^3 - 108$$

Substituting *x* from equation (i) we get,

$$\because \log_y (5) = \frac{1}{\log_5 y}$$

$$12(\log_5 y)^2 - \frac{81}{\log_5 y} - 54\log_5 y = (\log_5 y)^3 - 108$$

$$\therefore (\log_5 y)^4 - 12(\log_5 y)^3 + 54(\log_5 y)^2 - 108\log_5 y + 81 = 0$$

$$\therefore (\log_5 y - 3)^4 = 0$$

$$\therefore \log_5 y - 3 = 0$$

$$\therefore \frac{\log_{10} y}{\log_{10} 5} = 3$$

$\therefore \log_{10} y \approx 3 \times 0.7 = 2.1$

Hence, option 2.

Discuss the solution with Testfunda users.

## Solution #54: (16-Apr-09)

Statement A is implied in the passage because competition threatens Alitalia's core part of business, which is its 'services between Rome and Milan'.
Statement B is virtually contrary to the passage. First, because fuel prices have fallen. Second, because it is dwindling demand that is making the outlook bleak.
Statement C is not conclusive - it may be a possibility. Though the businessmen and bankers are at ease with risk, they hadn't 'anticipated the weakening demand'- is not conclusive and cannot be implied with any degree of certainty.
Statement D is supported by "investing in the phoenix-like rebirth"- the extract in quotes suggests that without them the airline 'would have been fully out of business'.
Therefore statements A and D are implied.
Hence, the correct answer is option 2.

Discuss the solution with Testfunda users.

## Solution #55: (17-Apr-09)

If $p$ is a 3 digit prime then $p^2$ is always greater than 2000.

$\therefore$ Highest power of $p$ dividing 2000! is $\left[\frac{2000}{p}\right]$.

Where $[x]$ represents greatest integer less than or equal to $x$.

Similarly, highest power of $p$ dividing 1000! is $\left[\frac{1000}{p}\right]$.

Now, $^{2000}C_{1000} = \frac{2000!}{1000! \times 1000!}$

$\therefore$ Highest power of $p$ dividing $^{2000}C_{1000}$

= highest power of $p$ dividing 2000! $-$ 2 $\times$ (highest power of $p$ dividing 100!)

$= \left[\frac{2000}{p}\right] - 2\left[\frac{1000}{p}\right]$

If $p > 666$ then,

$\left[\frac{2000}{p}\right] - 2\left[\frac{1000}{p}\right] = 2 - 2(1) = 0$

i.e. $p$ does not divide $^{2000}C_{1000}$.

Thus the required largest prime is such that it is less than 666.

The largest 3 digit prime less than 666 is 661.

$\therefore$ If $p = 661$ then,

$\left[\frac{2000}{p}\right] - 2\left[\frac{1000}{p}\right] = 3 - 2(1) = 1$

$\therefore$ 661 is the largest 3 digit prime dividing $^{2000}C_{1000}$.

Hence, option 1.

Discuss the solution with Testfunda users.

## Solution #56: (18-Apr-09)

Statement A is implied in the first statement of the passage, in which the two groups of campaigners- namely the "lobby to save animals or trees" and the lobby who try "to preserve languages"- are compared. The comparison establishes similarity.
B is implied in the first statement, as it states these campaigners are "a rare breed".
C is not implied. If at all we can conclude '*more African languages* are endangered' and not *African languages are more* endangered.
D is implied as the passage states that 50 to 90 percent of languages are going to die by the end of the century.
Therefore, statements A, B and D can be implied.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #57: (19-Apr-09)

$N$ = 101 × 10001 × 100000001 × (10000 … 0001)

$$\therefore N = (10^2 + 1) \times (10^4 + 1) \times (10^8 + 1) \times \ldots \times (10^{2^7} + 1)$$

Multiply and divide $N$ by $(10^2 - 1)$, we get,

$$\therefore N = \frac{10^4 - 1}{10^2 - 1} \times (10^4 + 1) \times (10^8 + 1) \times \ldots \times \left(10^{2^7} + 1\right)$$

$$\therefore N = \frac{10^8 - 1}{10^2 - 1} \times (10^8 + 1) \times \ldots \times \left(10^{2^7} + 1\right)$$

Continuing in this way, we get,

$$N = \frac{\left(10^{2^8} - 1\right)}{10^2 - 1}$$

$$\therefore N = \frac{[(10^2)^{128} - 1]}{10^2 - 1}$$

Using the formula for sum of $n$ terms of a G.P., we get,

$$S_n = 1 + r + r^2 + \cdots + r^{n-1} = \frac{(r^n - 1)}{(r - 1)}$$

$$\therefore N = [(10^2)^{127} + (10^2)^{126} + (10^2)^{125} + \cdots + 1]$$

$$\therefore N = 10^{254} + 10^{252} + \cdots + 10^2 + 1$$

$N$ = 10101010 … 01

This number $N$ is the addition of 128 terms and each term corresponds to one '1' digit.

∴ The final product has 128 one's.

Hence, option 3.

Discuss the solution with Testfunda users.

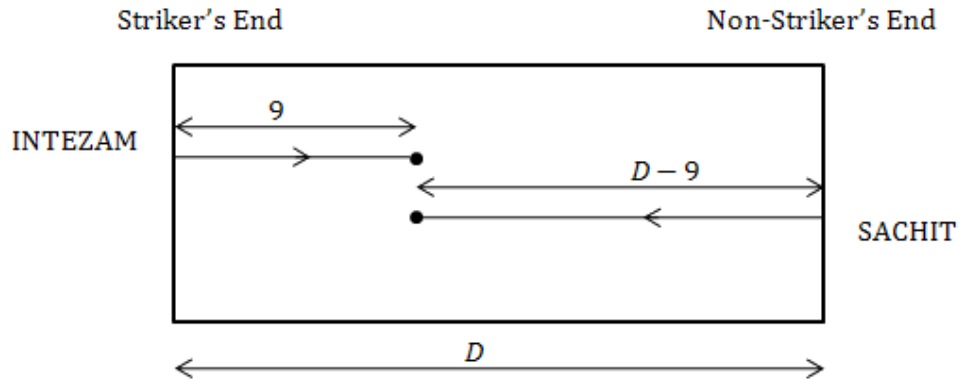
## Solution #58: (20-Apr-09)

"Castor" is 'a type of oil'. "Caster", comes from cast and means 'one who casts'. Since, the paragraph refers to a person, the word is "caster".
One "munches" on food and "mincing" is 'a process of cutting or chopping something'. Hence, the correct word is 'munching'.
"Baneful" means 'causing harm' or 'destruction'. Since the caster's wife only wants to only threaten and not cause any harm, the third word is "baleful", which means 'a menacing influence'.
"Awhile", an adverb is never preceded by a preposition like 'for'. Therefore, 'a while' is suitable.
"Cashew" is 'an edible nut' whereas, "cachou", our last word refers to 'a lozenge used for sweetening breath'. The second word is more suitable in this context.
Hence, the correct answer is option 3.

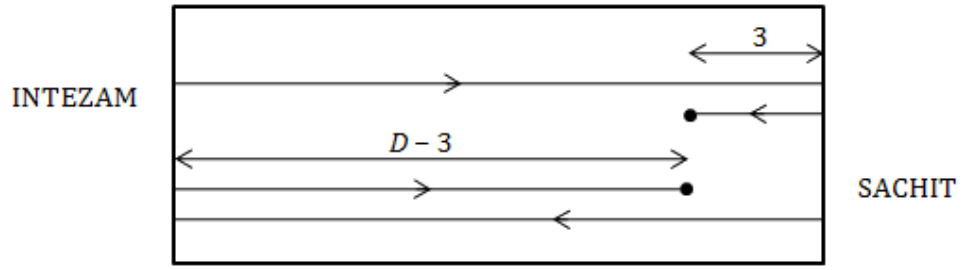
Discuss the solution with Testfunda users.

## Solution #59: (21-Apr-09)

**First Meeting**




**Second Meeting**




Total distance traveled by INTEZAM = $D + 3$
Total distance traveled by SACHIT = $2D - 3$

Refer to the diagram for all distances travelled.

Let $Vi$ = speed of Intezam in ft/s and $Vs$ = speed of Sachit in ft/s.

Also, $D$ be the distance between the stumps (in ft).

The time taken by Intezam and Sachit to reach their first crossing, beginning from the start of the first run, will be equal.

Hence, we have,

$$\frac{9}{Vi} = \frac{D-9}{Vs}$$

$$\text{or } \frac{Vs}{Vi} = \frac{D-9}{9}$$

The time taken by Intezam and Sachit to reach their second crossing, beginning from the start of the first run, will be equal.

Hence, we have,

$$\frac{D+3}{Vi} = \frac{2D-3}{Vs}$$

$$\text{or } \frac{Vs}{Vi} = \frac{2D-3}{D+3}$$

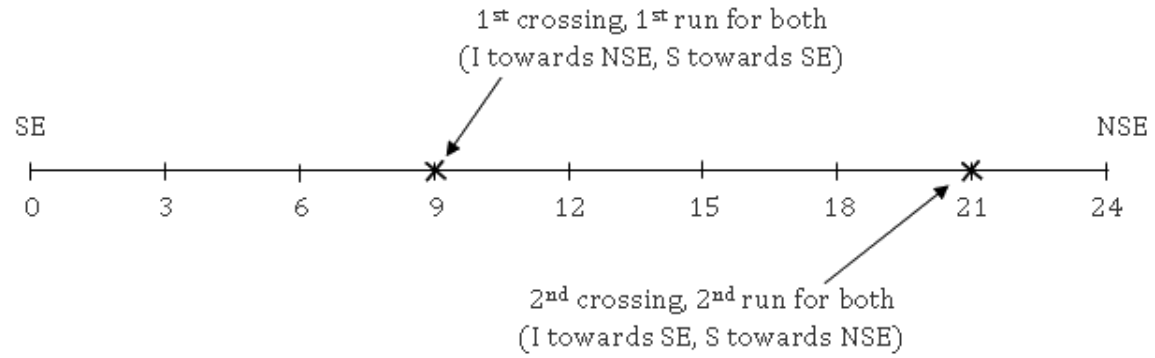
To find $D$, we equate the two values of $Vs/Vi$ obtained in the two steps above.

$$\therefore \frac{D-9}{9} = \frac{2D-3}{D+3}$$

$\therefore D = 24$ ft

$$\text{Also, } \frac{Vs}{Vi} = \frac{5}{3}$$

Now, we will use the values we have determined so far to find out where the third meeting will occur.

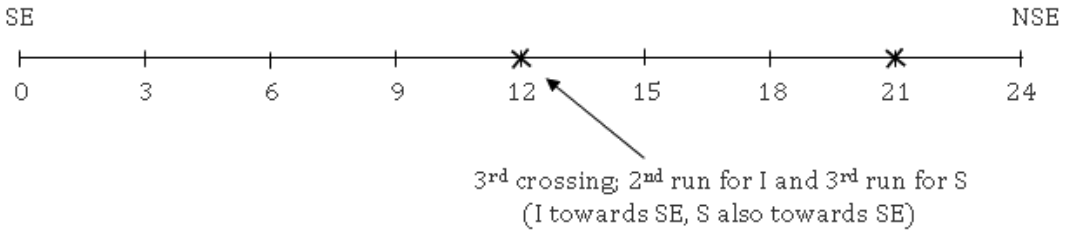



I - Intezam, S - Sachit, SE - Striker's End, NSE - Non-Striker's End

When Intezam and Sachit meet for the second time, they are both running their second run. After the second crossing, Intezam is running towards the striker's end and Sachit is running

towards the non-striker's end.

Since the ratio of speeds of Sachit and Intezam is 5:3, in the above diagram when Intezan moves 3 units, Sachit will move 5 units. Using this logic, we can determine where Intezam and Sachit will meet for the third time:




∴ They meet for the third time before Intezam has completed his second run and when Sachit is exactly in the middle of his third run.
∴ The total distance travelled by Sachit up to this point is $(2D + 12) = (48 + 12) = 60$ ft

Hence, option 3.

Discuss the solution with Testfunda users.

## Solution #60: (22-Apr-09)

"Assent" is 'saying yes, or agreeing to some point to view', whereas, "ascent" is 'climbing up' or 'climb'. Our first word is "ascent", as the author speaks about the upward movement or rise of the country.
"Autarchy" is similar 'to autocracy or despotism'. When we speak about good governance and more importantly 'economic self-sustainability' the word is "autarky".
"Disassembled"- 'taken apart' is the opposite of assembled. The country leaders want the 'taken apart' pieces of the country to be put together. "Dissemble" is 'to disguise or conceal under a false appearance'.
"Depositary" is our next word which means 'a trustee'. Although, "depository" is sometimes used for this, a trustee is specifically a depositary while depository also means 'a place for safe keeping'.
"Detrain" is 'to leave or cause to leave a railroad train', whereas our word is "detract"- 'divert ones attention or focus from'.
Hence, the correct answer is option 1.

Discuss the solution with Testfunda users.

## Solution #61: (23-Apr-09)

The roots of the equation $x^2 - 32x + 240 = 0$ are 12 and 20.
12 is not a possible value for the semiperimeter as then the sides of the triangle will be 6, 6, 12 which is not possible.
∴ $s = 20$ and the length of equal sides is 14.
The area of the triangle is given by $\sqrt{s(s-a)(s-b)(s-c)}$
∴ The area is $24\sqrt{10}$
Hence, option 4.

Discuss the solution with Testfunda users.

## Solution #62: (24-Apr-09)

Option 1 is not conclusive because it has also infected civilian networks, as mentioned in the passage.
Option 2 is also inconclusive- the passage does not imply that it infects only portable devices, but it may spread through infected portable devices. If it infects only portable devices there is no danger to vaster networks and therefore does not pose much danger which is contrary to the tone of the passage.
Option 3 is supported by the passage. "Every bit of portable memory in the sprawling American military establishment now needs to be scrubbed clean before it can be used again."
Options 4 and 5 are nonsensical options as glue cannot do anything to prevent malicious software programs from spreading. The bank merely used glue to block access to USB ports.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #63: (25-Apr-09)

Lagrange's four square theorem states that, 'Every positive integer can be expressed as the sum of four squares of integers'.

Consider the number 310, since we have to express it as the sum of squares of four integers we will first subtract the square of the number closest to it i.e. $17^2$.

$310 - 289 = 21$

Now we will subtract the square of the number closest to 21 i.e. $4^2$

$21 - 16 = 5$

Again we now subtract $2^2$ and then $1^2$ and we get a zero.

Hence, $310 = 17^2 + 4^2 + 2^2 + 1^2$

Similarly,

$123 = 11^2 + 1^2 + 1^2 + 0^2$

$59 = 7^2 + 3^2 + 1^2 + 0^2$

$67 = 8^2 + 1^2 + 1^2 + 1^2$

Hence, option 5.

Discuss the solution with Testfunda users.

## Solution #64: (26-Apr-09)

Option 1 is contrary to the data. The writer shows through the example of areca plantations that farming and wildlife can be easy bedfellows contrary to the general belief that they are not.
Option 2 cannot be inferred because the passage does not support the inference about "widespread".
Option 3 can be considered but this inference is partial- only about birds- whereas the passage mentions that the Western Ghats still remains a hotspot for biodiversity.
Option 4 which talks about areca plantations being biodiversity friendly is more inclusive as an inference than option 3.
Option 5 cannot be inferred because of the generalisation about the entire Western Ghats. The passage mentions that areca palms are hospitable to birds, not necessarily the entire Western ghats.
Hence, the correct answer is option 4.

Discuss the solution with Testfunda users.

## Solution #65: (27-Apr-09)

As AC is the middle term, AC = 4.5
Because the length of sides is in arithmetic progression, 2AC = AB + BC
From BC = 2AB and AC = 4.5, we get AB = 3 and BC = 6

$\therefore$ BD = 3, as AD bisects side BC.

Using Apollonius theorem, $AB^2 + AC^2 = 2(AD^2 + BD^2)$

$\therefore 3^2 + 4.5^2 = 2(AD^2 + 3^2)$

$\therefore AD \approx 2.35$

Hence, option 2.

Discuss the solution with Testfunda users.

## Solution #66: (28-Apr-09)

Option 5 appears close but it speaks of 'a certain disposition of action'- not an idea presented in the paragraph.
Option 3 has an issue with the tone which suddenly becomes very harsh. 'Beliefs' cannot be 'hammered into a person' nor can 'attitudes' be 'plastered'.
Option 2 limits itself to physical aspects and is contradictory to the paragraph which cites education as the most important factor for inculcating beliefs and aspirations.
Option 1 is close but it does not link well with the penultimate statement in the paragraph.
Option 4 links well with the penultimate statement of the paragraph which mentions the shaping and molding of young people into a standard form of social activity. The paragraph begins with the definition and process of self-renewal of a community or social group which is also addressed by option 4, 'standard form of social activity.'
Hence, the correct answer is option 4.

Discuss the solution with Testfunda users.

## Solution #67: (29-Apr-09)

$\because (a - b)^2 \geq 0$

$\therefore a^2 + b^2 - 2ab \geq 0$

$\therefore a^2 + b^2 \geq 2ab$

Similarly, $b^2 + c^2 \geq 2bc$ and $c^2 + a^2 \geq 2ac$

Now, $(a + b)(b + c)(c + a) = 2abc + c(a^2 + b^2) + b(a^2 + c^2) + a(b^2 + c^2)$

$\therefore (a + b)(b + c)(c + a) \geq 2abc + c(2ab) + b(2ac) + a(2bc)$

$\therefore (a + b)(b + c)(c + a) \geq 8abc$

$$\therefore \frac{(a+b)(b+c)(c+a)}{abc} \geq 8, \text{if } abc \text{ is positive}$$

Let a = sinx, b = siny and c = sinz

$\therefore$ a, b and c are positive real numbers (as x, y, z lie in the first quadrant),

$$\therefore \frac{(\sin x + \sin y)(\sin y + \sin z)(\sin z + \sin x)}{\sin x . \sin y . \sin z} \geq 8$$

Hence, the value of the expression has to be greater than 8.

Hence, option 3.

Discuss the solution with Testfunda users.

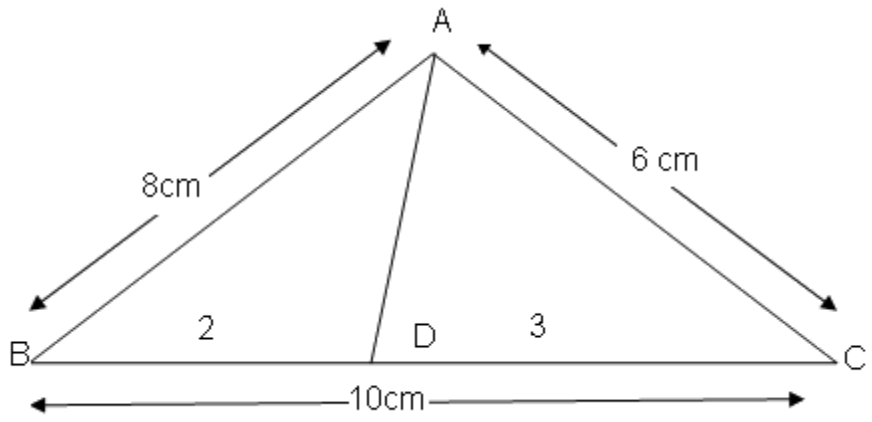
## Solution #68: (30-Apr-09)

Option 4 can be eliminated as the paragraph does not mention anything on victory or defeat.
Option 3 adds data - but does not complete the passage. It also brings in the new elements of 'love and co-habitation'.
Option 5 speaks of 'destitute'. The paragraph is silent on the economic condition of criminals and malefactors- central characters of the paragraph.
Option 1 is a possible answer but it brings in a new dimension which is not indicated in the paragraph.
Option 2 continues the idea of the penultimate statement beautifully and connects clearly with the central theme of the passage - rehabilitation or 'reformation' of criminals and malefactors.
Hence, the correct answer is option 2.

Discuss the solution with Testfunda users.

## Solution #69: (01-May-09)

Consider the diagram,




Apollonius Theorem states that given a ΔABC, if D is any point on BC such that it divides BC in the ratio $n$ : $m$ then

$mAB^2 + nAC^2 = mBD^2 + nDC^2 + (m + n)AD^2$ ... (i)

Here, $n = 2$ and $m = 3$

$$BD = \frac{2}{5} \times 10 = 4 \text{ cm}$$

$$DC = \frac{3}{5} \times 10 = 6 \text{ cm}$$

Substituting the values in (i), we get,

$3 \times (64) + 2 \times (36) = 3 \times (16) + 2 \times (36) + (2 + 3) \times AD^2$

$\therefore 192 + 72 = 48 + 72 + 5 \times AD^2$

$\therefore 144 = 5 \times AD^2$

$\therefore AD \approx 5.4$ cm

Hence, option 1.

Discuss the solution with Testfunda users.

## Solution #70: (02-May-09)

'Regretting' is a better word for the first blank in place of implying. One regrets one's weakness especially if one knows about them. Hence, we can eliminate options 2 and 4.
'Fritter' and 'squander' can both fit in the second blank. Although 'speculations' is a better word than 'trifles' for the third blank, we can still check the word for the fourth blank. Someone can be pushed or 'compelled' to sink one's fortunes, not emulated- copied. Copied from whom?
Hence, the correct answer is option 1.

Discuss the solution with Testfunda users.

## Solution #71: (03-May-09)

From the question itself, we know that $\Phi(9) = 6$
We calculate the totient of an integer less than 9 and co prime to 9, say 4.
$\Phi(4) = 2$ (1 and 3 are the only positive integers less than 4 that are co prime to it)

Now,
$\Phi(4 + 9) = \Phi(13) = 12$ ($\because$13 is a prime number and 1, 2, 3, ..., 12 are co prime to it)
And, $\Phi(4) + \Phi(9) = 6 + 2 = 8$
$\therefore \Phi(4) + \Phi(9) < \Phi(4 + 9)$

$\therefore$ We can eliminate options (1) and (4).
$\Phi(9 - 4) = \Phi(5) = 4$ (1, 2, 3, 4 are positive integers less than and co prime to 5)
$\Phi(9) - \Phi(4) = 6 - 2 = 4$
Option (2) may hold true.

But,
$\Phi(9 - 4) < \Phi^2(9) - \Phi(4) = 36 - 4 = 32$
$\therefore$ We can eliminate option (5) too.
$\Phi(36) = 12$ (1, 5, 7, 11, 13, 17, 19, 23, 25, 29, 31, and 35 are less than and co prime to 36)

And, $\Phi(4) \times \Phi(9) = 12$
$\therefore \Phi(4) \times \Phi(9) = \Phi(36)$

Hence, option (3) may also be true.

We now check option (2) with a different set of values of $m$ and $n$.

We know that $\Phi(36) = 12$ and $\Phi(23) = 22$. And 36 and 23 are co prime to each other.
$\Phi(36 - 23) = \Phi(13) = 12$
And, $\Phi(36) - \Phi(23) = 12 - 22 = -10$
$\therefore \Phi(36 - 23) > \Phi(36) - \Phi(23)$
So we can eliminate option (2).
Hence, option 3.

Observation: If $p$ is any prime number then, $\Phi(p) = p - 1$ i.e. there are $p - 1$ positive integers less than $p$ that are co prime to it.

Discuss the solution with Testfunda users.

## Solution #72: (04-May-09)

The paragraph emphasizes the importance of transmission of ideas and practices for the constant renewing of the social fabric. It further states that it is not automatic. To continue the line of thought option 2 expresses it best by stating that the "renewal is not automatic" but that 'pains' need to be taken.
Options 3 and 4 may also continue the idea but they give detailed treatment to the concept on rearing the young, a topic not mentioned in the paragraph.
Options 1 and 5 can be easily eliminated since they do not connect well with the penultimate statement in the paragraph.
Hence, the correct answer is option 2.

Discuss the solution with Testfunda users.

## Solution #73: (05-May-09)

Mr. Sharma goes to the market with Rs. 252 but we don't know if he spends the entire amount in buying watermelons and mangoes.

If he bought $x$ mangoes and $y$ watermelons.

Then, $4x + 3y \leq 252$

∴ We cannot determine the amount he spent in buying mangoes.

Hence, option 5.

**Extra Learning:**

If the question would have given that, Mr. Sharma spent the entire amount in buying watermelons and mangoes then the question would have the following solution.
Let the number of mangoes he buys be $x$ and the number of water melons he buys be $y$.
Then, $4x + 3y = 252$

$x = (252 - 3y)/4$

The possible values of $y$ such that $x$ is a natural number (he has to buy at least one mango and one watermelon) are given in the following sets:

$(x, y)$ = (60, 4), (57, 8), (54, 12), (51, 16), (48, 20), (45, 24), (42, 28), (39, 32), (36, 36), (33, 40), (30, 44), (27, 48), (24, 52), (21, 56), (18, 60), (15, 64), (12, 68), (9, 72), (6, 76), (3, 80)

We can see that the values of $y$ are multiples of 4 in ascending order and values of $x$ are multiples of 3 in descending order.

But, the number of watermelons and mangoes are not co prime to each other, number of mangoes is multiples of 4 and the difference between the number of mangoes and watermelons should be minimum. We get two possible values of $x$ and $y$, respectively 48 and 20 and 24 and 52.

∴ The amount he spends on mangoes, in this case too, cannot be determined.

Discuss the solution with Testfunda users.

## Solution #74: (06-May-09)

The second blank should be 'consistency' and not 'inconsistency' because the other quality mentioned i.e. 'clearness' is a positive quality whereas 'inconsistency' is essentially negative. Therefore, options 1 and 5 are eliminated.
Similarly, the third blank should be "experience" and not "inexperience" because, the statement mentions "qualification" and 'inexperience' is something that one would not quote as a qualification. Therefore, option 4 is eliminated.
Option 3 cannot be the correct answer option because there is no such word as 'thoroghly'.
Hence, the correct answer is option 2.

Discuss the solution with Testfunda users.

## Solution #75: (07-May-09)

$f(x^2 + 1) = x^4 + 7x^2 + 9$

Lets write $x^4 + 7x^2 + 9$ in terms of $x^2 + 1$.

$x^4 + 7x^2 + 9 = (x^2 + 1)^2 + 5(x^2 + 1) + 3$

Put $x^2 + 1 = t$ in function $f$,

$\therefore f(t) = (t)^2 + 5(t) + 3$

Also, $f(x^2 + 1) = g(x^2 - 1) = g[(x^2 + 1) - 2]$

$\therefore f(t) = g(t - 2)$

Now, we have, $f(g(p)) = g(f(p))$

$\therefore f(g(p)) = f[f(p) + 2]$ ...[Since $g(t) = f(t + 2)$]

$\therefore g(p) = f(p) + 2$

$\therefore f(p + 2) = f(p) + 2$ ...[Since $g(t) = f(t + 2)$]

$(p + 2)^2 + 5(p + 2) + 3 = p^2 + 5p + 3 + 2$

$p^2 + 4p + 4 + 5p + 10 + 3 = p^2 + 5p + 5$

$4p + 12 = 0$

$p = -3$

Hence, option 5.

Discuss the solution with Testfunda users.

## Solution #76: (08-May-09)

Statement 1 mentions the need for lubrication. So, the next logical statement would be the effect of lack of lubrication. Thus, 1-B link is identified. This eliminates options 3, 4, 5 based on this connection.
The different types of lubricants used in different engines, from simple to complex, are described serially in the D-C-A link.
Statement A links well with statement 6 as statement 6 describes the process of "pressure" lubrication introduced in statement A.
Hence, the correct answer is option 1.

Discuss the solution with Testfunda users.

## Solution #77: (09-May-09)

**Consider option 1:**

$$f(2,3,6) = \max\left(\frac{2}{2}, 3, \frac{6}{3}\right) = \max(1,3,2) = 3$$

$g(2, 5, 1) = \min(4, 5, 3) = 3$

$h(2, 3, 1) = \max\{\min(2, 3), \min(3, 1), \min(1, 2)\} = \max(2, 1, 1) = 2$

$\therefore k\{f(2, 3, 6), g(2, 5, 1), h(2, 3, 1)\} = k(3, 3, 2)$

$$= \min\left\{\max(3,3), \min(3,3,2), \max\left(\frac{3}{3}, \frac{3}{3}, \frac{2}{3}\right)\right\} = \min(3,2,1) = 1$$

So option 1 is not true.

**Consider, option 2:**

$g(4, 8, 2) = \min(8, 8, 6) = 6$

$f(6, 5, 12) = \max(3, 5, 4) = 5$

$\therefore g(4, 8, 2) > f(6, 5, 12)$

So option 2 is true.

**Consider, option 3:**

$$k(4,9,16) = \min\left\{\max(4,9), \min(4,9,16), \max\left(\frac{4}{3}, \frac{9}{3}, \frac{16}{3}\right)\right\}$$

$$= \min\left(9, 4, \frac{16}{3}\right) = 4, \text{which is a perfect square.}$$

So option 3 is also true.

Only option 2 and 3 are true.

Hence, option 4.

Discuss the solution with Testfunda users.

## Solution #78: (10-May-09)

The sequence of DCB- unbreakable- can be very easily deciphered.
Statement D introduces the topic of the paragraph.
Statement C expands upon the more "than it can consume locally" mentioned in statement D and B mentions the fact that these "expatriates rarely forget their country of origin".
This eliminates options 1, 3 and 5.
The only difficulty- if at all- is in placing the statement A, before DCB (option 4). It is better placed at the end so that undue importance is not attributed to it in the paragraph by placing it in the beginning. It is better treated as an example and placed at the end rather than making it trigger the other statements.
Hence, the correct answer option is 2.

Discuss the solution with Testfunda users.

## Solution #79: (11-May-09)

If we carefully observe the algorithm, we get the values of $x$, $y$ and $p$ as follows,

**Initial Values:**

$x = 1$,

$y = 1$,

$p = 0$

**After loop 1:**

$x = 1 + 1 = 2$ (Prime),

$y = 1 + 2 = 3$,

$p = 0 + 2 + 3 = 5$

**After loop 2:**

$x = 2 + 3 = 5$ (Prime),

$y = 3 + 5 = 8$,

$p = 5 + 5 + 8 = 18$

**After loop 3:**

$x = 5 + 8 = 13$ (Prime),

$y = 8 + 13 = 21$,

$p = 18 + 13 + 21 = 52$

**After loop 4:**

$x$ = 13 + 21 = 34 (Composite),

$y$ = 21 + 34 = 55,

$p$ = 52

**After loop 5:**

$x$ = 34 + 55 = 89 (Prime),

$y$ = 55 + 89 = 144 (Perfect square),

$p$ = 52 + 89 + 144 = 285

After this, algorithm will jump to step 7,

∴ $p$ = 285 + 89 + 144 = 518

And then it stops.

∴ Final value of $p$ = 518

Hence, option 1.

Discuss the solution with Testfunda users.

## Solution #80: (12-May-09)

Statement D is the only statement that can start the paragraph as it introduces the topic - "economic growth rate" of China and India using new data.This eliminates option 2 and 5.
Statement B mentions the inelasticity in increase in regional growth and says that it is not so at the national level.
Statement E then adds to this by saying that the national growth rate can, too, be considered to be "inelastic" and supports this with an illustration. This establishes a BE link. This eliminates option 1. Thus, the answer has to be between options 3 and 4.
Statement A will link well with statement D because while D introduces the topic by mentioning an investigation carried out by Leong, statement A describes how this investigation was carried out, i.e. "explicitly identified using instrumental variables". Thus, the DA link at the beginning of the sequence eliminates option 4.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #81: (13-May-09)

Let '$m$' be the marked price of the item and '$c$' be the cost price of the item.

As marked price of the item is 25% above cost price, so $m = 1.25c$

∴ Maximum discount that the shopkeeper can give is 20% so that he does not bear any loss.

Let $a$, $b$, $c$ (natural numbers) be the discount percentages offered by shopkeeper to 3 customers.

Customers buy these items at $m\left(1-\frac{a}{100}\right), m\left(1-\frac{b}{100}\right)$ and $m\left(1-\frac{c}{100}\right)$ prices.

These prices are in A.P.

$$\therefore m\left(1-\frac{a}{100}\right)+m\left(1-\frac{c}{100}\right)=2m\left(1-\frac{b}{100}\right)$$

∴ $(100 - a) + (100 - c) = 2(100 - b)$

∴ $a + c = 2b$

Here, $a$, $b$, $c$ cannot exceed 20.

Number of Possible sets of $(a, b, c)$ are as follows.

When $a = 1$;

(1, 2, 3), (1, 3, 5), (1, 4, 7), (1, 5, 9), (1, 6, 11), (1, 7, 13), (1, 8, 15), (1, 9, 17), (1, 10, 19)

Number of sets = 9

Similarly, When $a = 2$; Number of sets = 9

Similarly, When $a = 3$; Number of sets = 8

Similarly, When $a = 4$; Number of sets = 8

Similarly, When $a = 5$; Number of sets = 7

Similarly, When $a = 6$; Number of sets = 7

Similarly, When $a = 7$; Number of sets = 6

Similarly, When $a = 8$; Number of sets = 6

Similarly, When $a = 9$; Number of sets = 5

Similarly, When $a = 10$; Number of sets = 5

Similarly, When $a = 11$; Number of sets = 4

Similarly, When $a = 12$; Number of sets = 4

Similarly, When $a$ = 13; Number of sets = 3

Similarly, When $a$ = 14; Number of sets = 3

Similarly, When $a$ = 15; Number of sets = 2

Similarly, When $a$ = 16; Number of sets = 2

Similarly, When $a$ = 17; Number of sets = 1

Similarly, When $a$ = 18; Number of sets = 1

So, total possible sets = 90

∵ These three discounts can be given to three different customers in 6 different ways.

∴ The number of ways shopkeeper can do this = 90 × 6 = 540

Hence, option 5.

Discuss the solution with Testfunda users.

## Solution #82: (14-May-09)

The main points about allegory are: It is a figure of rhetoric and can be visual and not limited to language. It is broader in meaning and is fuller and sustained longer than a metaphor or analogy. A parable is an example. The above points are captured succinctly in option 3. In comparison the other options are deficient in one or the other points.
Options 1, 2 and 5 do not liken an “allegory” to a “parable”, an important point in the paragraph since this point makes the meaning of an allegory clear and definite.
Option 4 misses out on the ‘visual’ part of an allegory.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #83: (15-May-09)

As ABCD is a kite, its diagonals are perpendicular to each other and AC bisects BD.

$AB^2 = AE^2 + BE^2 = 25$

$$\text{Also, } \frac{AE \times BD}{2} = 12 \qquad (\because \text{Area of } \Delta ABD = 12)$$

But, BD = 2 × BE

∴ AE × BE = 12

Now, $(AE + BE)^2 = (AE^2 + BE^2) + (2 \times AE \times BE)$

$= 25 + 24 = 49$

∴ AE + BE = 7

The possible values of AE and BE are (6, 1), (5, 2), (4, 3).

But, (6, 1) and (5, 2) are not possible as AEB is right triangle.

∴ AE = 4 and BE = 3 (∵ AE > BE)

∴ BD = 6

So the sides of the ΔABD are (5, 5, 6).

$$\text{Radius of circle} = \text{circum-radius} = \frac{a \times b \times c}{4 \times \text{Area}}$$

$$= \frac{25}{8}$$

Hence, option 2

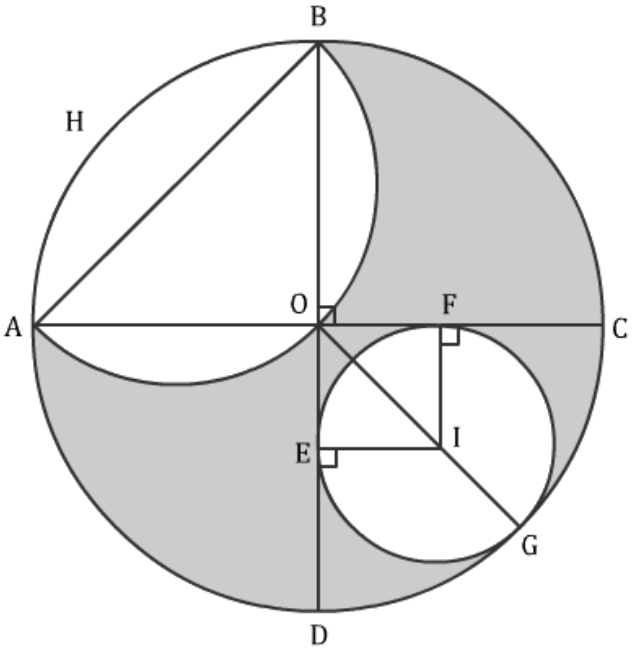
Discuss the solution with Testfunda users.

## Solution #84: (16-May-09)

Option 1 is opposite of what the ending should be, the person should ideally be moving towards priesthood and not away from it, once he has acknowledged GOD.
In Option 2, "but" makes the paragraph completion incorrect because the previous sentence states clearly that man acknowledges the presence of GOD and moving towards priesthood would be a natural corollary to that.
In option 3, "the belief overpowers everything the society does" is inverse in meaning to the previous sentence where man acknowledges a "vague" acknowledgement of the presence of GOD, the acknowledgement is not strong enough to "overpower everything the society does"
In Option 5, "and the belief counts for little in their lives" should ideally be "but the belief counts for little in their lives" since the previous sentence reveals man's acknowledgement of GOD.
Option 4 with "but the belief counts for little in their lives" best completes the sentence.
Hence, the correct option is option 4.

Discuss the solution with Testfunda users.

## Solution #85: (17-May-09)




Let the radius of the semi-circle be $R$ and the radius of the small circle be $r$.

For semi-circle, $AB^2 = AO^2 + BO^2$

$\therefore (2R)^2 = (2a)^2 + (2a)^2$

$\therefore 4R^2 = 8a^2$

$\therefore R = \sqrt{2}a$

For small circle, OG = OI + IG

$\therefore 2a = \sqrt{2}r + r$

$\therefore 2a = (\sqrt{2} + 1)r$

$\therefore r = \frac{2a}{\sqrt{2}+1}$

$r = 2a(\sqrt{2} - 1)$

∴ Area of the shaded region = Area of big circle − Area of semi-circle AOB – Area of small circle with center I – Area of the segment AHB

$= \pi(2a)^2 - \frac{\pi}{2}(\sqrt{2}a)^2 - \pi[2a(\sqrt{2} - 1)]^2 - \left[\frac{\pi}{4}(2a)^2 - \frac{1}{2}(2a)^2\right]$

$= 2a^2[1 + (4\sqrt{2} - 5)\pi]$

Hence, option 2.

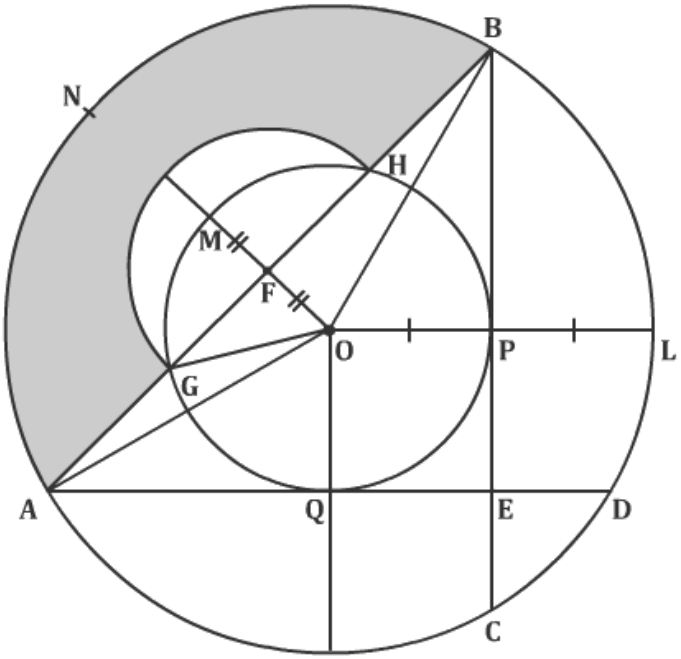
Discuss the solution with Testfunda users.

## Solution #86: (18-May-09)

Statements A, C and E are correct.
The correct usage in statement B would be– 'The more haste, the less speed'. Lesser is a comparative degree of the verb to compare. Since the verb haste in the first half of the sentence is in simple present tense, so will be 'less'. The sentence is an epigram. An epigram is a brief pointed saying frequently introducing antithetical ideas, which excite surprise and arrest attention.
Statement D is also incorrect because 'a funeral *as* modest magnificence' is wrong. The correct sentence is– 'a funeral *of* modest magnificence'. Modest magnificence describes the noun funeral. Modest magnificence is an oxymoron. An oxymoron is a combination of contradictory or incongruous words- a paradox reduced to two words, usually in an adjective-noun ("eloquent silence") or adverb-adjective ("inertly strong") relationship, and is used for effect, complexity, emphasis, or wit.
Hence the correct answer is option 5.

Discuss the solution with Testfunda users.

## Solution #87: (19-May-09)




∵ Chord BC bisects OL and chord AB bisects OM,

$\therefore$ Radius of the inner circle, $OP = \frac{OL}{2} = 2a$

and, $OF = \frac{OM}{2} = a$

Now consider ΔOGF,

$OG^2 = OF^2 + GF^2$

$(2a)^2 = a^2 + GF^2$

$\therefore$ Radius of semicircle, $GF = \sqrt{3}a$

Consider ΔOBF, $OB^2 = BF^2 + OF^2$

$\therefore (4a)^2 = BF^2 + a^2$

$\therefore BF = \sqrt{15}a$

$\therefore AB = 2 \times BF = 2\sqrt{15}a$

In ΔABE, ∠ABE = 45° ...[∵ ΔABE is isosceles triangle]

and ∠OBP = 30° ...[∵ ΔOBP is right angled triangle and OB = 2OP]

∴ ∠OBF = 15°
∴ ∠BOF = 90° – 15°= 75°
∴ ∠AOB = 2 × 75 = 150°

∴ Area of shaded region = Area of the sector O-ANB – Area of the triangle OAB – Area of the semicircle

$$= \frac{150}{360}\pi \times (4a)^2 - \frac{1}{2} \times (2\sqrt{15}a) \times a - \frac{1}{2}\pi(\sqrt{3}a)^2$$

$$= \left[\frac{31}{6}\pi - \sqrt{15}\right]a^2$$

Hence, option 4.

Discuss the solution with Testfunda users.

## Solution #88: (20-May-09)

Option 1 cannot be concluded because if what we eat is our medicine, it contradicts the passage. Everyone *has a doctor in him* (the writer is referring to the healing force within) is not enough to conclude that everyone *is a doctor*. Therefore option 2 is incorrect.
Option 4 is incorrect because nothing about the source of the healing force can be concluded.
Option 3 can be concluded– we should help the healing force– our food should be our medicine and vice versa makes option 3 true.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #89: (21-May-09)

Statement C introduces 'so-called protoplasm or cellular substance.' Therefore the ideas of cell-protoplasm, which essentially is an idea emanating from protoplasm, in statements A and E can only follow after statement C is mentioned. Any option having statement A or E preceding statement C can therefore be ruled out. Therefore, we can eliminate options 3, 4 and 5.
In option 2, statement A precedes E whereas A can only follow statement E. Statement A mentions 'The nucleus is the more important of the two'. The two are "cell-protoplasm" and "nucleus" mentioned in E. Therefore, option 2 can also be eliminated.
By elimination the correct answer option is 1. Lets evaluate option 1
It starts with statement D which introduces the idea of "tiny cell".
Statement C talks of its composition.
Statement B mentions that 'inspite of most widely differing elements' (mentioned in statement C) it is "constant and unchanging".
Statement E takes the composition further with cell-protoplasm and nucleus and A ends with the final detail- that is of the nucleus being the more important of the two.There is a continuation of ideas and a smooth flow of specific details introduced in succession without any abrupt changes.
Hence, the correct answer is option 1.

Discuss the solution with Testfunda users.

## Solution #90: (22-May-09)

Statement C introduces 'so-called protoplasm or cellular substance.' Therefore the ideas of cell-protoplasm, which essentially is an idea emanating from protoplasm, in statements A and E can only follow after statement C is mentioned. Any option having statement A or E preceding statement C can therefore be ruled out. Therefore, we can eliminate options 3, 4 and 5.
In option 2, statement A precedes E whereas A can only follow statement E. Statement A mentions 'The nucleus is the more important of the two'. The two are "cell-protoplasm" and "nucleus" mentioned in E. Therefore, option 2 can also be eliminated.
By elimination the correct answer option is 1. Lets evaluate option 1
It starts with statement D which introduces the idea of "tiny cell".
Statement C talks of its composition.
Statement B mentions that 'inspite of most widely differing elements' (mentioned in statement C) it is "constant and unchanging".
Statement E takes the composition further with cell-protoplasm and nucleus and A ends with the final detail- that is of the nucleus being the more important of the two.There is a continuation of ideas and a smooth flow of specific details introduced in succession without any abrupt changes.
Hence, the correct answer is option 1.

Discuss the solution with Testfunda users.

## Solution #91: (23-May-09)

BC = Side of the small equilateral triangle = $3a$ units

$$\therefore \text{OG} = \text{Radius of the circumcircle} = \frac{2}{3} \times \text{height of the equilateral triangle ABC}$$

$$\therefore \text{OG} = \frac{2}{3} \times \frac{\sqrt{3}}{2} \times 3a = \sqrt{3}a \text{ units}$$

The point O divides AH (median) in the ratio 2 : 1

$$\therefore \text{OH} = \frac{\text{OA}}{2} = \frac{\sqrt{3}}{2}a \text{ units}$$

$$\text{Now, HF} = \frac{\text{BC}}{2} = \frac{3}{2}a$$

$$\therefore \text{OF} = \text{OH} + \text{HF} = \frac{\sqrt{3}}{2}a + \frac{3}{2}a = \frac{3+\sqrt{3}}{2}a$$

$$\therefore \text{ED} = 2\text{OF} = \left(3+\sqrt{3}\right)a$$

Area of the shaded region = Area of semicircle F-DOE − Area of the rhombus OBGC − (Area of trapezium BCED − Area of semicircle H-BFC)

$$= \frac{1}{2}\pi(\text{OF})^2 - \frac{1}{2}\text{OG} \times \text{BC} - \left[\frac{1}{2}(\text{BC} + \text{ED}) \times \text{HF} - \frac{1}{2}\pi(\text{HF})^2\right]$$

$$= \frac{1}{2} \times 3 \times \left(\frac{3+\sqrt{3}}{2}a\right)^2 - \frac{1}{2}\sqrt{3}a \times 3a - \left[\frac{1}{2}\left\{3a + \left(3+\sqrt{3}\right)a\right\} \times \frac{3}{2}a - \frac{1}{2} \times 3 \times \left(\frac{3}{2}a\right)^2\right]$$

$$= \frac{27}{8}a^2$$

Hence, option 2.

Discuss the solution with Testfunda users.

## Solution #92: (24-May-09)

Options 3 and 5 give us a negative result on reading the gospel which is untrue and opposite to what the penultimate statement in the paragraph wants us to do, that is to free our mind of prejudice and read the gospel.
Option 1 is vague and hidden with sinister meaning which is not intended by the author.
Option 4 is frivolous and cannot be inferred from the paragraph. The word 'Although' does not link well with the penultimate statement of the paragraph.
Therefore option 2: that it would bring a "portrait of freshness and power to those who read" the gospel without prejudice is a positive inference and one which the author intends.
Hence, the correct answer is option 2.

Discuss the solution with Testfunda users.

## Solution #93: (25-May-09)

Given $\alpha, \beta$ are the roots of the equation $x^2 + px + q - 2 = 0$

$\therefore \alpha + \beta = -p$ and $\alpha\beta = q - 2$

$$\therefore \frac{\alpha+\beta}{\alpha\beta} = -\frac{p}{q-2}$$

$$\therefore \frac{1}{\beta}+\frac{1}{\alpha} = -\frac{p}{q-2}$$

Also $\gamma, \delta$ are the roots of the equation $x^2 - px + q - 4 = 0$

$\therefore \gamma + \delta = p$ and $\gamma\delta = q - 4$

$$\therefore \frac{\gamma+\delta}{\gamma\delta} = \frac{p}{q-4}$$

$$\therefore \frac{1}{\delta}+\frac{1}{\gamma} = \frac{p}{q-4}$$

It is given that $\alpha\beta\gamma\delta = 48$

$\therefore (q - 2)(q - 4) = 48$

$\therefore q^2 - 6q - 40 = 0$

$\therefore q^2 - 10q + 4q - 40 = 0$

$\therefore q(q - 10) + 4(q - 10) = 0$

$\therefore (q - 10)(q + 4) = 0$

$\therefore q = 10$ or $-4$

Also, it is given that

$$\frac{1}{\alpha}+\frac{1}{\beta}+\frac{1}{\gamma}+\frac{1}{\delta}=\frac{3}{8}$$

$$\therefore -\frac{p}{q-2}+\frac{p}{q-4}=\frac{3}{8}$$

If $q = 10$, then we have

$$-\frac{p}{8}+\frac{p}{6}=\frac{3}{8}$$

$\therefore p = 9$

If $q = -4$, then we have

$$-\frac{p}{-6}+\frac{p}{-8}=\frac{3}{8}$$

$$\text{i.e.}\frac{p}{6}-\frac{p}{8}=\frac{3}{8}$$

$\therefore p = 9$

Thus, in both the cases i.e. $q = 10$ or $-4$, $p$ has a unique value of 9.

Hence, option 1.

Discuss the solution with Testfunda users.

## Solution #94: (26-May-09)

The paragraph begins with "heat kills" - then it does not discuss anything else. The 'heat' then becomes global warming. That's all. The last statement cannot bring in anything new or that which requires clarification. This eliminates options 3, 4 and 5.
It is a close choice between options 1 and 2. Option 2 loses out on account of introducing new elements such as lack of 'resources' and 'health care'.
Option 1 continues on the same theme. The only statement among the ones given in the options that can be considered as the last statement of the given paragraph.
Hence, the correct answer is option 1.

Discuss the solution with Testfunda users.

## Solution #95: (27-May-09)

Given $\alpha, \beta, \gamma, \delta$ form an increasing G.P.
Let $\alpha = a, \beta = ar, \gamma = ar^2$ and $\delta = ar^3$
Given that $\alpha, \beta$ are the roots of the equation $x^2 - 4x + p = 0$
$\therefore \alpha + \beta = 4$
$\therefore a + ar = 4$
$\therefore\ a(1 + r) = 4$ ...(i)

Also, given that $\gamma, \delta$ are the roots of the equation $x^2 - 36x + q = 0$
$\therefore \gamma + \delta = 36$
$\therefore ar^2 + ar^3 = 36$
$\therefore\ ar^2(1 + r) = 36$ ...(ii)

Dividing equation (ii) by equation (i), we get $r^2 = 9$
Thus we have $r = 3$ or $-13$
But since $r$ is the common ratio of an increasing G.P, it cannot be negative.
$\therefore r = 3$

Substituting $r = 3$ in equation (i), we get $a = 1$
$\therefore$ We have $\alpha = 1, \beta = 3, \gamma = 9$ and $\delta = 27$
Also, we have $\alpha\beta = p$ and $\gamma\delta = q$
$\therefore p + q = 3 + 243 = 246$

Hence, option 5.

Discuss the solution with Testfunda users.

## Solution #96: (28-May-09)

This question is interesting becuase of the technical nature of the content, rather than the inherent difficulty of solving it.
The CD link can be deciphered. Statement C mentions what the different "transistor packages" are made of while statement D mentions that the type of package "often dictates the power rating and frequency characteristics". Therefore, options 2,4 and 5 can be eliminated.
The BA link is also clear. Statement B introduces "surface mount device" or SMD while A mentions the reason why SMDs "have better high frequency characteristics". Therefore, option 1 can be eliminated.
Hence, the correct answer is option 3.

Discuss the solution with Testfunda users.

## Solution #97: (29-May-09)

For $x = 11$ and $y = 0$, we have $N = \frac{11!}{11!\,0!} = {}^{11}C_0$

For $x = 10$ and $y = 1$, we have $N = \frac{11!}{10!\,1!} = {}^{11}C_1$

For $x = 9$ and $y = 2$, we have $N = \frac{11!}{9!\,2!} = {}^{11}C_2$

...
...
...

For $x = 0$ and $y = 11$, we have $N = \frac{11!}{0!\,11!} = {}^{11}C_{11}$

∴ The sum of all the possible values of $N = {}^{11}C_0 + {}^{11}C_1 + {}^{11}C_2 + \ldots + {}^{11}C_{11} = 2^{11} = 2048$

Hence, option 4.

Discuss the solution with Testfunda users.

## Solution #98: (30-May-09)

Option 1 inverts what the people of Vondervotteimittis are and therefore can be eliminated. Option 2 and 3 can both be considered as true for the people of that town but the best answer option is option 4, which captures the ideas of both options 2 and 3 that is, change (alterations) and adventure (risk). Hence, the correct answer is option 4.

Discuss the solution with Testfunda users.

## Solution #99: (31-May-09)

Let the first term of the geometric progression be $a$ and the common ratio be $r$.

The $n^{th}$ term of a geometric progression is given by $t_n = ar^{n-1}$

We need to determine the value of the thirteenth term i.e. $ar^{12}$.

**From statement A:**

Given that $t_6 = 4$

$\therefore ar^5 = 4$

But from this we cannot determine the value of $ar^{12}$.

$\therefore$ Statement A alone is not sufficient.

**From statement B:**

Given that $t_{10} \times t_{16} = 4096$

$\therefore ar^9 \times ar^{15} = 2^{12}$

$\therefore a^2r^{24} = 2^{12}$

$\therefore (ar^{12})^2 = (2^6)^2$

$\therefore ar^{12} = \pm(2^6)$

$\therefore$ We cannot determine the unique value of the thirteenth term from statement B alone.

$\therefore$ Statement B alone is also not sufficient.

**From statement A and B together:**

$\because ar^5$ is positive, either both $a$ and $r$ are positive or both are negative.

When both $a$ and $r$ are positive, $ar^{12}$ is positive, but when both $a$ and $r$ are negative, $ar^{12}$ is negative.

$\therefore$ We cannot determine the unique value of the thirteenth term from statement A and B together also.

$\therefore$ The question cannot be answered on the basis of the two statements.

Hence, option 5

Discuss the solution with Testfunda users.

## Solution #100: (01-Jun-09)

The paragraph begins by stating the beneficial effects of beet root juice on hypertension and ends (without the last statement) by stating that it might be an effective low cost treatment for hypertension.
A statement that will continue this is one which points out in what other ways it could be beneficial.
Option 1 does this by suggesting that beetroot as well as nitrate rich vegetables can contribute to a 'healthy cardiovascular system'.
Options 2 and 4 try to undermine the findings of the paragraph. This is not warranted and does not make for an effective conclusion.
Option 3 does nothing to conclude the paragraph. It merely reiterates something that has already been mentioned in the paragraph.
Option 5 excludes the "nitrate" part and brings in "a diet rich in fruit and vegetables"- a new element.
Hence, the correct answer is option 1.

Discuss the solution with Testfunda users.

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