

**INSTRUCTIONS**

1. Read the instructions given at the beginning/end of each section or at the beginning of a group of questions very carefully.
2. This test has two sections with 60 questions – 30 questions in each section. The TOTAL TIME available for the paper is **140 minutes**. The time available for each section is 70 minutes and you cannot return to the first section once you have started the second section.
3. You are expected to show your competence in both the sections.
4. All questions carry three marks each. Each wrong answer will attract a penalty of one mark.

**SECTION – I**  
**Number of Questions = 30**

**DIRECTIONS** for questions 1 to 12: Answer the questions independently of each other.

1. Find the remainder when  $18^{323}$  is divided by 325.  
(A) 1      (B) 2      (C) 18      (D) 307
2. A four-digit number N has 15 factors. How many factors can  $N^2$  have?  
(A) 29      (B) 30      (C) 45      (D) Either 29 or 45
3. The sum of the first 30 terms of an arithmetic progression equals twice the sum of the first 20 terms. Find the ratio of the sum of the first 32 terms to the sum of the first 42 terms of the same progression.  
(A)  $\frac{8}{21}$       (B)  $\frac{16}{21}$   
(C)  $\frac{8}{13}$       (D) Cannot be determined
4. Find the positive square root of  
 $13 + \sqrt{48} + \sqrt{72} + \sqrt{96}$   
(A)  $\sqrt{5} + \sqrt{2}(\sqrt{3} + 1)$       (B)  $\sqrt{2} + \sqrt{3} + \sqrt{8}$   
(C)  $\sqrt{2} + \sqrt{5} + \sqrt{6}$       (D)  $2 + \sqrt{3}(\sqrt{2} + 1)$
5. Farooq purchases two watermelons, one weighing 20% more than the other. However, due to the summer heat, the combined weight of the two watermelons reduces by  $1/4^{\text{th}}$ . If the weight of the heavier watermelon reduces to 75% of its initial weight, then the lighter watermelon incurs a weight loss of  
(A) 20%      (B) 25%      (C) 5%      (D) 22.5%
6. The cost of 3 bananas and 8 apples is ₹48 more than the cost of 4 chikos. The cost of 5 bananas and 7 chikos is ₹29 more than the cost of 2 apples, whereas the cost of 4 bananas, 3 chikos and 1 apple is equal to ₹31. Find the cost of 1 apple, 1 banana and 1 chikoo.  
(A) ₹13      (B) ₹19      (C) ₹21      (D) ₹12
7. How many four-digit numbers exist for which the product of the digits is equal to 18?  
(A) 36      (B) 24      (C) 3      (D) 72
8.  $f(x)$  is a quadratic function which attains its minimum value of 36 at  $x = 6$ . If  $g(x)$  is a function such that  $2f(x) + 3g(x) = 0$ , then  
(A)  $g(x)$  attains its minimum value at  $x = -4$ .  
(B)  $g(x)$  attains a maximum value of -36.  
(C)  $g(x)$  attains a maximum value of -24.  
(D) None of these
9. The angle of elevation of the top of a lighthouse from a moving ship changed from  $30^{\circ}$  to  $60^{\circ}$  when ship moved  $100\sqrt{3}$  m towards the lighthouse. Find the height of the lighthouse.  
(A) 90 m      (B) 150 m      (C) 120 m      (D) 180 m
10. B and C together can do a certain work in one-third of the time in which A alone can do it, whereas A and B together can do the same work in half the time in which C alone can do it. If B alone can do the work in 28 days, then how long will A and C together take to do it?  
(A) 15 days      (B) 20 days  
(C)  $12\frac{1}{2}$  days      (D) Cannot be determined
11. If the three vertices of a triangle in the co-ordinate plane are  $(0, 0)$ ,  $(k, 0)$ ,  $(k/2, \ell/2)$ , then which of the following lines will definitely pass through the orthocentre of the triangle?  
(A)  $x + y = \frac{k + \ell}{2}$       (B)  $x = k/2$   
(C)  $x + y = k + \ell$       (D)  $y = \ell/2$
12. A square well is dug in a rectangular field of length 20 m and breadth 15 m. If the well, when filled to the brim, can hold 7,20,000 litres of water, 10% of which can cover the remaining field upto a height 0.3 m, then the depth, D, of the well, lies in which of the following ranges? ( $1 \text{ m}^3 = 1000 \text{ litres}$ )  
(A)  $6 \text{ m} \leq D < 9 \text{ m}$       (B)  $9 \text{ m} \leq D < 12 \text{ m}$   
(C)  $12 \text{ m} \leq D < 15 \text{ m}$       (D)  $15 \text{ m} \leq D < 18 \text{ m}$

**DIRECTIONS** for questions 13 to 15: Answer the questions on the basis of the information given below.

**Per Capita Availability of Selected Consumption Commodities**

Year	Edible Oil (kg)	Vanaspati (kg)	Sugar (kg)	Coffee (< 10 gm)	Tea (< 100 gm)
1965-66	2.7	0.8	5.7	7.2	3.46
1975-76	3.5	0.8	6.1	6.2	4.46
1985-86	5.0	1.3	11.1	7.1	5.89
1995-96	7.0	1.0	14.1	5.5	6.46
2000-01	8.2	1.3	15.8	5.8	6.31
2001-02	8.8	1.4	16.0	6.7	6.50
2002-03	7.2	1.4	16.3	6.7	5.96

13. In how many instances from 1975-76 to 2002-03 did the per capita availability of sugar grow at a faster rate (when compared to the preceding period) than that of edible oil?  
 (A) 3      (B) 1      (C) 2      (D) 4
14. If per capita availability of coffee in any year is equal to 16% of the per capita production of coffee and

that of tea is 80% of its per capita production, then the per capita production of coffee was closest to that of tea in the year

- (A) 1965-66      (B) 1995-96  
 (C) 2002-03      (D) 2000-01

15. For the consumption commodities mentioned, the highest percentage change in per capita availability of any commodity in any period when compared to the previous period is

- (A) 76.89%      (B) 73.82%  
 (C) 84.76%      (D) 81.97%

**DIRECTIONS** for question 16: Select the correct alternative from the given choices.

16. The multiplication of two numbers is shown below.

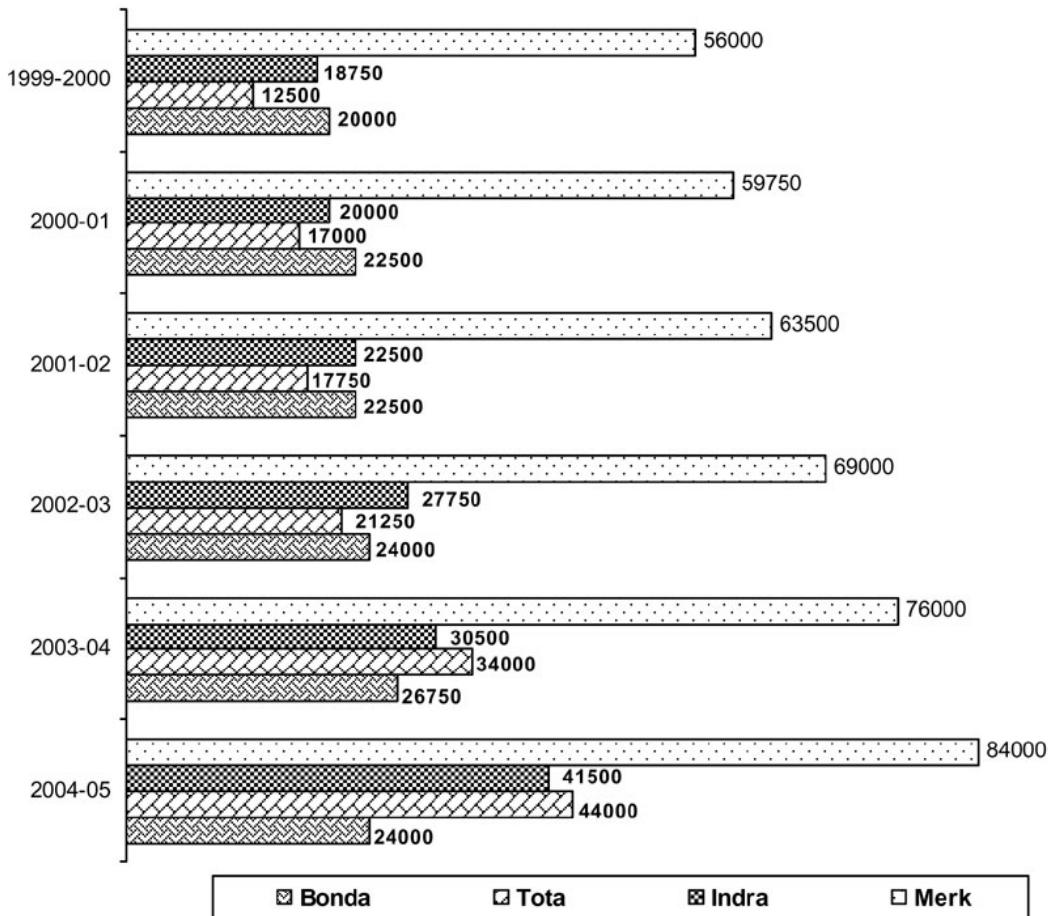
$$\begin{array}{r} \text{AD4} \\ \times \text{E} \\ \hline \text{A206} \end{array}$$

where A, D, and E are all distinct digits.

The value of A + E is

- (A) 8      (B) 9      (C) 11      (D) 10

**DIRECTIONS** for questions 17 and 18: Answer the questions on the basis of the information given below.

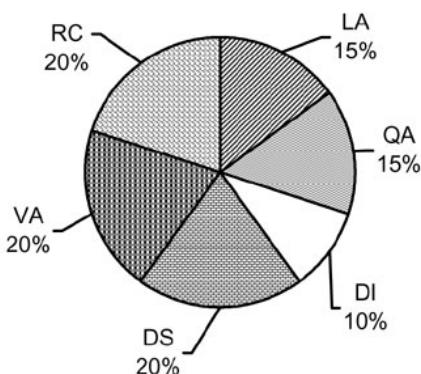


The bar graph above indicates the annual sales value (in '000 \$) of four brands of cars in New Delhi in the period 1999-2000 to 2004-05.

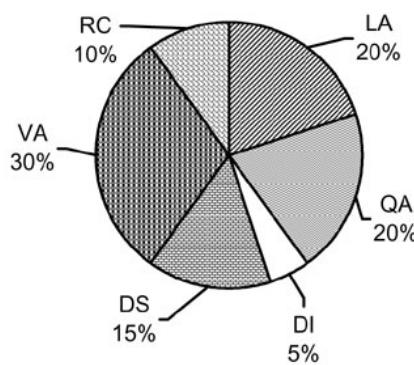
**DIRECTIONS:** For questions 68-69, read the following passage and choose the best answer from the options given.

The following pie-charts give the information regarding the area-wise distribution of the number of 1-mark and 2-mark questions in a test and also the area-wise distribution of the marks obtained by Ramesh, a student who appeared for the test. The test comprised only 1-mark and 2-mark questions.

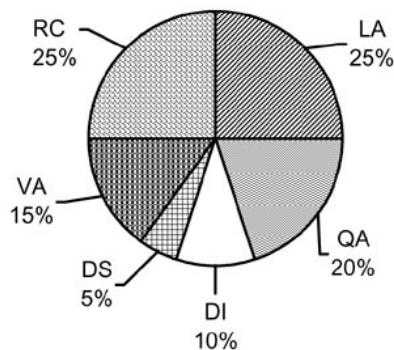
## Distribution of the number of 1-mark questions across six sections



## Distribution of the number of 2-mark questions across six sections



### **Distribution of the total marks obtained by Ramesh across six sections**



**Note:**

- (i) No negative mark was given for any wrong attempt or for any question left unattempted.
  - (ii) A total of 500 questions were asked in the test out of which 80 questions were from QA.
  - (iii) Total marks of Ramesh in the test = 300.

22. The total number of 1-mark questions attempted correctly by Ramesh cannot be  
 (A) 284      (B) 282      (C) 286      (D) 280

23. The maximum possible total marks in the test are  
 (A) 600      (B) 650      (C) 700      (D) 750

24. The minimum number of questions which Ramesh could have attempted in DI is  
 (A) 25      (B) 15      (C) 14      (D) 16

25. Which of the following statements is definitely true regarding the performance of Ramesh in the test?  
 (A) The number of 2-mark questions attempted correctly in QA is more than that in DI.  
 (B) The number of 2-mark questions attempted correctly in DI is less than that in LA.  
 (C) The number of 2-mark questions attempted correctly in RC is more than that in DI.  
 (D) The number of 1-mark questions attempted correctly in VA is less than that in DS.

**DIRECTIONS** for questions 26 to 30: Answer the questions independently of each other.

26. A straight line passing through the points A(-3, 2) and B(6, 5) intersects the x-axis at the point P. Find the distance PA.  
 (A) 8 units      (B)  $2\sqrt{10}$  units  
 (C) 6 units      (D)  $2\sqrt{11}$  units

27. Amit took a car loan of Rs.3,31,000 at an interest rate of 10% per annum compounded annually. The loan has to be repaid in three equal annual instalments. Find the amount which Amit has to pay at the end of each year.  
 (A) ₹1,10,333      (B) ₹1,21,360  
 (C) ₹1,46,850      (D) ₹1,33,100

28. What is the sum of the series :  

$$\frac{1}{40} + \frac{1}{88} + \frac{1}{154} + \dots + \frac{1}{59290} ?$$
  
 (A)  $\frac{48}{240}$       (B)  $\frac{16}{245}$       (C)  $\frac{48}{245}$       (D)  $\frac{3}{49}$

29. The ratio of the incomes of Ajay and Bina is 5 : 4 and the ratio of their expenditures is 6 : 5. If the ratio of their savings is 7 : 5, what percentage of his income does Ajay save?  
 (A) 28%      (B) 25%      (C) 20%      (D)  $16\frac{2}{3}\%$

30. If  $x$  and  $y$  are natural numbers, which satisfy the relation  $\log_2(x - 7) = 2\log_4(5 - y)$ , find the maximum value of  $\log_4x - \log_2\left(\frac{8}{\sqrt{y}}\right)$   
 (A) 1.5      (B) -0.5  
 (C)  $\log_2\sqrt{3} - 1$       (D)  $\log_23 - 2$

**SECTION – II**

- DIRECTIONS** for question 1: The following question presents four statements of which three, when placed in appropriate order would form a contextually complete paragraph. Pick the statement that is not part of that context.

1. (A) People with more severe anemia can have shortness of breath; severe anemia increases cardiac output, leading to palpitation and sweatiness, and even to heart failure.  
(B) Anemia can be the result of blood stem cell failure and can also result from iron deficiency, as this causes the red cells that are produced to be smaller and to contain little hemoglobin.  
(C) Red cells carry oxygen on their hemoglobin to all our cells; reduction in this essential transport can result in anemia, causing a feeling of fatigue in general or during exercise.  
(D) These changes are reversible if oxygen is soon supplied again, provided that the mitochondria and surface membrane have not been too badly damaged.

**DIRECTIONS** for questions 2 to 4: The sentences given in each of the following questions, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. From among the four choices given below each question, choose the most logical order of sentences that constructs a coherent paragraph.

2. (a) The State energy minister insisted that the government concede to the demand for five percent reservation without delay.

- (b) The much-awaited channel of dialogue which opened for the first time between the Rajasthan government and Gujjars held out little hope of an amicable settlement.

(c) The Gujjars continued their blockade of rail tracks and roads across the state and organized a bandh in half-a-dozen towns, clashing with security forces.

(d) The discussion on demand for five percent reservation in government jobs remained inconclusive.

(e) Gujjar leader Kirori Singh Bainsla rejected the proposal put forth by the government.

(A) bdcea (B) abecd (C) dbcae (D) bacde

3. (a) Researchers recently reported in 'Science' the discovery of hundreds of typical Acheulian artifacts as old as 1.51million years at Attirampakkam site near Chennai.

(b) Stone tools used by early Homosapiens provide direct evidence of their cognitive and technological evolution.

(c) Acheulian tools, also called the hand axes, are tear drop shaped cutting tools that followed the Oldowan tools about 1.7million years ago.

(d) Oldowan tools which are sharp stone flakes struck from river cobbles first appeared some 2.6million years ago.

(e) Despite the simplicity of production both Oldowan and Acheulian tool-making process activate different parts of the brain.

(A) eabdc (B) ecdba (C) bdcea (D) bdcae

**DIRECTIONS** for questions 5 to 7: Read the following passage and answer the questions that follow it.

**T**oday, popular culture bleeds from every pore. Zombies, vampires and wolf men have conquered the best-seller lists, movie screens and the prime-time schedule. Serial-killer thrillers like "The Silence of the Lambs" and "No Country for Old Men" win Academy Awards. Clearly, something has happened here, and Jason Zinoman's book, "Shock Value", aims to tell us the what, the who, the why and the how.

Where "Shock Value" excels is in its primary research, the stories of how the seminal shockers of this era came to be, told in large part by the men (and here and there a woman) who made them. A critical early moment came in 1968, when the producer Robert Evans strong-armed "Rosemary's Baby" away from the b-grade director William Castle and gave it to Roman Polanski, who employed Manhattan locations, upscale stars and psychological realism to distance it from gimmicky screamers like Castle's "Tingler." Voila: New Horror was born.

"What the New Horror movies share," Mr. Zinoman writes, "is a sense that the most frightening thing in the world is the unknown, the inability to understand the monster right in front of your face." "Shock Value" follows this thread from "Night of the Living Dead" to "The Last House on the Left," a 1972 revenge shocker based on Ingmar Bergman's "Virgin Spring" and directed by a weedy former college professor named Wes Craven. The trail continues on through 1974's "Texas Chainsaw Massacre," a movie that is nowhere near as bloody as people think, yet that remains powerfully (at times comically) disturbing. And it leads to the sleek twin horrors of the late 1970s: the nightmarish extraterrestrial of Ridley Scott's "Alien" and Michael Myers of John Carpenter's "Halloween."

Describing that character – the serial killer as blank slate – Mr. Zinoman writes of Mr. Carpenter, "Influenced by the terror of Samuel Beckett, he wanted an empty space at the heart of the movie, where the answers usually are." "Shock Value" makes similar far-reaching connections throughout its pages and, surprisingly, backs many of them up. Who knows that Mr. Carpenter referred to his first film, "Dark Star," as "Waiting for Godot in space," or that William Friedkin, the "Exorcist" director, was so enamored with Harold Pinter's psychically terrifying stage plays that he adapted one for film?

If there's a secret hero of this book, though, it is Dan O' Bannon, who also doubles as its sacrificial lamb. Creative and cranky – so much so that he was effectively sidelined by his more ambitious peers – O' Bannon may have left as his most lasting legacy his original script for "Alien" and that film's most unforgettable scene, in which the title creature bursts out of a character's stomach. The sequence was inspired by O' Bannon's struggle with Crohn's disease that ultimately killed him.

That kind of personal insight is what Mr. Zinoman does best. What he does less well is provide an overarching structure to his tale that gives it shape and direction.

Most disappointingly Mr. Zinoman has trouble deciding what it all means. How did the DNA of these pioneering films mutate, for better and mostly worse, into the brutal pop entertainments of today – horror movies whose envelope pushing is an empty gesture instead of a cultural jolt? It's unclear.

5. Which of the following statements about "Shock Value" best captures the theme of the book?  
(A) How the genre of horror films conquered Hollywood.  
(B) How a few mavericks invented modern horror.  
(C) How the horror-film culture evolved into its present avatar.  
(D) How the horror films attracted critical acclaim.

6. Which of the following statements about horror films inspired by play-wrights can be inferred from the passage?  
(A) The character of Michael Myers is based upon Samuel Beckett.  
(B) "Exorcist" was an adaptation of one of Pinter's characteristic plays.

(C) "Dark Star" is a science fiction film.  
(D) One does not understand the protagonist in Carpenter's horror film 'Halloween'.

7. Which of the following statements describes an important issue NOT being raised in the context of "Shock value"?  
(A) Discussions of broader changes in the film industry and the culture as a whole.  
(B) The films and film makers who introduced New Horror.  
(C) The shared canvas of modern horror films.  
(D) Insight into the creation of the monster in a horror film.

**DIRECTIONS** for questions 8 to 11: Read the following passage and answer the questions that follow it.

The waters of the Gulf below a thousand feet are a relatively new frontier for oilmen and one of the toughest places on the planet to drill. The seafloor falls off the gently sloping continental shelf into jumbled basin and range-like terrain, with deep canyons, ocean ridges, and active mud volcanoes 500 feet high. More than 2000 barrels of oil a day seep from scattered natural vents. But the commercial deposits lie deeply buried, often beneath layers of shifting salt that are prone to undersea earth quakes. Temperature at the sea floor are near freezing, while the oil reservoirs can hit 400 degrees Fahrenheit; they're like hot, shaken soda bottles just waiting for some one to pop the top.

For decades the exorbitant costs of drilling deep kept commercial rigs close to shore. But shrinking reserves, spiking oil prices, and spectacular off shore discoveries ignited a global rush into deep water.

In the Gulf of Mexico, the U. S. Congress encouraged companies to go deep as early as 1995. That year it passed a law for giving royalties on deep water oil fields leased between 1996 and 2000. A fleet of new rigs was soon punching holes all over the Gulf at a cost of up to a millions dollar a day each.

It wasn't long before the industry hit pay dirt. New fields with names like Atlantis, Thunder Horse and Great White, came just in time to offset a long term decline in shallow water oil production. The Gulf of Mexico now accounts for 30 percent of U. S production with half of that coming from deep water. The industry has drilled in 10,000 feet of water and to total depths of 35,050 feet. The U. S. government estimates that the deep Gulf might hold 45 billions barrels of crude. "We're in deep water because that's where the resources are", says Larry Reed, an operations consultant in Houston.

As technology was taking drillers deeper, however, the methods for preventing blowouts and cleaning up spills did not keep pace. Since the early 2000s, reports from industry and academia warned of the increasing risk of deep water blowouts, the fallibility of blowout preventers, and the difficulty of stopping deep water spill after it started – a special concern given that deep water wells, because they're under such high pressure, can spout as much as 100,000 barrels a day.

The Minerals Management Service (MMS) routinely downplayed such concerns. A 2007 agency study found that from 1992 to 2006, only 39 blowouts occurred during the drilling of more than 15,000 oil and gas wells in the Gulf. Few of them released much oil, only one resulted in a death. Most of the blowouts were stopped within a week, typically by pumping the wells full of heavy drilling mud or by shutting them down mechanically and diverting the gas bubble that had produced the dangerous "kick" in the first place.

Though blowouts were relatively rare, the MMS report did find a significant increase in the number associated with cementing, the process of pumping cement around the steel well casing to fill the space between it and the wall of the bore hole. In retrospect, that note of caution was ominous.

8. According to the passage, which of these is NOT a cause of blowouts?
    - (A) Absence of tests to check the bonding of cement
    - (B) Poor maintenance of blowout preventers
    - (C) Preventing the formation of gas bubbles
    - (D) Frozen but unstable gases at the sea floor
  9. When Larry Reed says, "We're in deep water because that's where the resources are", he means that
    - (A) the oil companies are playing a very dangerous game.
    - (B) deep water drilling has been productive.
    - (C) no one can bail out the ailing companies.
    - (D) the deep water areas are where oil reserves are in plenty.
  10. The comparison to the soda bottle
    - (A) suggests the inevitability of accidents.
    - (B) is used to bring out the need for caution in deep sea drilling.
    - (C) is to help the readers understand the nature of drilling.
    - (D) points to the fact that undersea drilling has all the ingredients for a blowout.
  11. As given in the passage, all the following statements are untrue, EXCEPT:
    - (A) The oil industry has been rolling in profits without paying heed to safety standards.
    - (B) The author is not confident that the industry is tapping undersea oil safely.
- (C) Since blowouts are rare, the risks associated with drilling for oil in new Frontier need not be a matter of concern.  
(D) The actions of companies, in serving the global addiction to oil while failing to consider the future, will have disastrous consequences.

**DIRECTIONS** for questions 12 to 14: Each of the following questions has a paragraph from which the last sentence, or part thereof, has been deleted. From the given options, choose the sentence that completes the paragraph in the most appropriate way.

12. The Law Commission has yet again opened a perennial debate, just as Supreme Court and High Court Judges returned from their summer break. The commission asks why they need a two-month vacation. It is aghast at the number of pending cases – the High Court in Uttar Pradesh is the worst offender with over nine lakh cases in the queue. But this is a tricky issue which has defied the reformist zeal of some Supreme Court Chief Justices, let alone government persuasion.  
(A) Supreme Court judges say they should not be judged by the hours they spend in the courtroom.  
(B) Judges need a respite from the daily grind to study and cogitate.  
(C) Most judges defend the vacation, saying they are actually working hard.  
(D) What judges do at home and office is not visible to the ordinary person, they argue.

13. The golden arches of the McDonald's were meant to make Americans, in any part of the world, feel at home. The Filet-O-Fish has subsequently become so intertwined with the urban experience that even the incredibly cultured city of Kolkata fell victim to the deep-fried rather bland version of maach. Travellers like Ibn Batuta, Marco Polo and Sir Thomas Roe talked about thousand-pillar halls, spices and dazzling jewels, but in a world where the civilized is determined by the number of burger joints, the shimmer of a translucent muslin seems just a distraction.
- (A) There is no way to keep outsiders at bay.  
(B) The world has shrunk to a slender crisp fry and the best kept secret will be beamed on You Tube.  
(C) Innocence needs a better guard than isolation.  
(D) But like nostalgia, there are some things that are more powerful unseen than the 'in-your-face'.
14. Cities are living entities. They have distinct features, formed by their history, geography and industry. More importantly, they have distinct personalities, forged by the collective hopes, trials and lives of their residents.
- (A) Thus, people shape the city's attitude.  
(B) A city's attitude is as distinct as DNA.  
(C) Changing demographics are sculpting new city attitudes.  
(D) The relationship between a city and its people is symbiotic, for even as people make up a city, the city makes its people.

**DIRECTIONS** for questions 15 to 17: Read the following passage and answer the questions that follow it.

**C**ommerce has long been at the mercy of the elements. The British East India Company was almost strangled at birth when it lost several of its ships in a storm. But the toll is rising. The world has been so preoccupied with the man-made catastrophes of subprime mortgages and sovereign debt that it may not have noticed how much economic mayhem nature has wreaked. With earthquakes in Japan and New Zealand, floods in Thailand and Australia and tornadoes in America, last year was the costliest on record for natural disasters.

This trend is not, as is often thought, a result of climate change. There is little evidence that big hurricanes come ashore any more often than, say, a century ago. But disasters now extract a far higher price, for the simple reason that the world's population and output are becoming concentrated in vulnerable cities near earthquake faults, on river deltas or along tropical coasts. Those risks will rise as the wealth of Shanghai and Kolkata comes to rival that of London and New York. Meanwhile, interconnected supply chains guarantee that when one region is knocked out by an earthquake or flood, the reverberations are global.

This may sound grim, but the truth is more encouraging. When poor people leave the countryside for shantytowns on hillsides or river banks they are exposed to mudslides and floods, but also have access to better-paying, more productive work. Richer societies may lose more property to disaster but they are also better able to protect their people. Indeed, although the economic toll from disasters has risen, the death toll has not, despite the world's growing population.

The right role for government, then, is not to resist urbanisation but to minimise the consequences when disaster strikes. This means, first, getting priorities right. At present, too large a slice of disaster budgets goes on rescue and repair after a tragedy, and not enough on beefing up defences beforehand. Cyclone shelters are useless if they fall into disrepair. A World Bank study recommends using schools and other bits of normal public infrastructure in disaster-protection plans, so that the kit and buildings are properly maintained.

Second, government should be fiercer when private individuals and firms, left to pursue their own self-interest, put all of society at risk. For example, in their quest for growth, developers and local governments have eradicated sand dunes, mangrove swamps, reefs and flood plains that formed natural buffers between people and nature. Preserving or restoring more of this natural capital would make cities more resilient, much as increased financial capital does for the banking system. In the Netherlands dykes have been pushed out and flood plains restored to give rivers more room to flood.

Third, governments must eliminate the perverse incentives their own policies produce. Politicians are often under pressure to limit the premiums insurance companies can charge. The result is to underprice the risk of living in dangerous areas—which is one reason that so many expensive homes await the next hurricane on Florida's coast. When governments rebuild homes repeatedly struck by floods and wildfires, they are subsidising people to live in hazardous places.

For their part companies need to operate on the assumption that a disaster will strike at some point. This means preparing contingency plans, reinforcing supply chains and even, costly though this might be, having reserve suppliers lined up: there is no point in having a perfectly efficient supply chain if it can be snapped whenever nature takes a turn for the worst. Disasters are inevitable; their consequences need not be.

15. The last sentence of the passage implies that

  - (A) we have to pay the price for our inability to prevent disasters like earthquakes and hurricane.
  - (B) man has been at the mercy of natural elements since time immemorial.
  - (C) while we may not be able to stop the occurrence of natural calamity, we can protect people and properties.
  - (D) disaster and its consequences are two different things to be addressed independently.

16. What, according to the author, is the truth that is encouraging?

  - (A) Urbanisation enables people to earn more even if more lives are lost in a calamity.
  - (B) While property may be lost, human lives can be fully protected.
  - (C) Globalization has caused the effect of a calamity to be spread thin.
  - (D) The lives lost in natural disasters are not higher than earlier despite increase in global population.

17. All of the following are steps that can be taken to limit the damage when nature strikes EXCEPT:

  - (A) Restoring natural systems that help to contain the fury of a flood or a cyclone.
  - (B) Preventing population build up in vulnerable cities.
  - (C) Focussing more on preventive measures rather than merely on rescue and rehabilitation.
  - (D) Allowing market forces to work freely so that holding properties in risk-prone area become costlier.

**DIRECTIONS** for questions 18 to 20: Answer the questions on the basis of the information given below.

Each of eight executives - Joe, Jane, Jack, Jill, John, Joseph, Jatin and Jughead – in a company owns a flat on a distinct floor in a building with eight floors. The following information is known:

- (i) Joe's flat is below Jack's flat and neither of the two has his flat on the eighth floor.
  - (ii) Jane's flat is below Joseph's flat and immediately above Jughead's flat.
  - (iii) Joseph's flat is immediately above Joe's flat.
  - (iv) John's flat is above Jughead's flat and immediately above Jatin's flat.
  - (v) Jill's flat is below Jatin's flat but not immediately below.

18. Who among them owns a flat on the sixth floor?  
(A) Jatin  
(B) Jack  
(C) Jill  
(D) Cannot be determined






**DIRECTIONS** for questions 21 to 23: Answer the questions on the basis of the information given below.

Four men – Satish, Rajesh, Harish and Mahesh – and four women – Kavya, Divya, Anusha and Shruti – all working professionals, earning distinct salaries, attend a matrimonial meet to choose their respective life partners. The matchmaker decides to pair up his clients by ranking the males and females separately in decreasing order of their salaries, and then pairing up a male and a female with identical ranks. The following additional information is known:

- (i) Satish has a higher salary than Mahesh.
  - (ii) Kavya does not earn a higher salary than Divya but earns a higher salary than Anusha.
  - (iii) Harish is paired with Anusha.
  - (iv) Satish is paired with Divya, who is ranked 2nd among the females.

21. Which of the following is true?

  - (A) Mahesh is ranked 3rd among the males.
  - (B) Anusha is ranked 3rd among the females.
  - (C) Shruti earns the 3rd lowest salary among the females.
  - (D) More than one of the above.



23. Which of the following is the correct order of rankings from 1 through 4 for the males?  
(A) Satish, Rajesh, Harish, Mahesh  
(B) Rajesh, Harish, Satish, Mahesh  
(C) Rajesh, Satish, Mahesh, Harish  
(D) Mahesh, Satish, Rajesh, Harish

**DIRECTIONS** for questions 24 and 25: In the question, there are five sentences. Each sentence has pairs of words / phrases that are italicized and highlighted. From the italicized and highlighted words / phrases select the most appropriate words /phrases to form correct sentences. Then from the options given choose the best one.

24. (1) We have to wade through the **mote** (a) / **moat** (b) to reach the castle.

(2) I believe that Mark is the person who **perpetrated** (a) / **perpetuated** (b) the assassination of the President.

(3) **Perspicuity** (a) / **Perspicacity** (b) is the ability to understand clearly.

(4) The life boat was sent to rescue two more children who were in a small inflatable **dinghy** (a) / **dingy** (b) which was sinking.

(5) People should be **prodigal** (a) / **prodigious** (b) when spending for marriage; one shouldn't squander hard-earned money on pomp and show.

(A) baaba (B) bbbaa (C) aahaa (D) babaa

25. (1) As soon as he heard the good news, Ravi went inside to ***prostate*** (a) / ***prostrate*** (b) himself before the idol of his favourite god.

(2) We should discard all that ***lumber*** (a) / ***lumbar*** (b); they've converted our bedroom into a storeroom.

- (3) I **loathe** (a) / **loathe** (b) him for all his despicable acts.
- (4) We saw a **marten** (a) / **martin** (b) fly past, it is such a beautiful bird.
- (5) Meghna thinks she can pass the examination by **swotting** (a) / **swatting** (b) on the day before the exam.
- (A) aabba (B) bbaaa (C) baaba (D) babba

**DIRECTIONS** for questions 26 to 28: Answer the questions on the basis of the information given below.

In Mamboland, elections were held in 2011 for a total of 190 seats. A total of five political parties NPC, TCM, JPB, PPC and NIC participated in the elections. The number of seats won by each party is a distinct number among 25, 30, 40, 45 and 50. The following additional information is known.

- (i) The sum of seats won by NPC and TCM is same as those won by JPB and PPC.
  - (ii) NIC did not win the highest number of seats.
  - (iii) The number of seats won by TCM is less than those won by NPC and the number of seats won by PPC is greater than those won by JPB.
26. If TCM did not secure the least number of seats, for how many of the following pairs of political parties is the difference in the number of seats secured the minimum?
- (i) TCM and PPC
  - (ii) NPC and NIC
  - (iii) JPB and TCM
  - (iv) NIC and JPB
- (A) 3 (B) 2 (C) 1 (D) 4
27. To form the government, it is required that a party or an alliance of parties has secured not less than two-third of the total number of seats contested. Which of the following alliances has a definite chance of forming the government?
- A) NPC, NIC, PPC (B) NPC, PPC, TCM  
(C) JPB, PPC, NIC (D) TCM, JPB, NIC

28. On complaints of polling irregularities, recounting of votes was done and consequently, five seats deemed to have been won by PPC were awarded to NIC. If after the recounting, no two parties won the same number of seats, how many seats were won by PPC?
- (A) 30 (B) 40 (C) 45 (D) 50

**DIRECTIONS** for questions 29 and 30: In each question, there are five sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are correct in terms of grammar and usage. Then, choose the **most appropriate** option.

29. (a) The Nubian Aquifer, the font of fabled oasis in Egypt and Libya  
(b) stretches languidly across 770,000 square miles of northern Africa,  
(c) a pointillist collection of underground pools of water migrating through rock and sand toward the Mediterranean Sea.  
(d) the aquifer is one of the world's oldest  
(e) but its working - how it flows and how quickly surface water replenishes it - have been hard to understand.
- (A) a, b and c (B) b, c and d  
(C) a, b and e (D) a and e
30. (a) The remains of a pair of ancient compound eyes that belonged to the world's first super predator  
(b) have been discovered by fossil hunters in Australia.  
(c) Anomalocaris was a soft-bodied marine beast that patrolled the oceans more than half a billion years ago.  
(d) Adults grew to a metre long and had eyes on its stalks.  
(e) Researchers uncovered the fossilised eyes in a 515 million-year-old rock layers in Kangaroo island, South Australia.
- (A) a, b and e (B) b and c  
(C) d and e (D) a, b and c

**(Key and Solutions for AIMCAT1319)**

**Key**

**SECTION – I**

- |      |       |       |       |       |       |
|------|-------|-------|-------|-------|-------|
| 1. D | 6. A  | 11. B | 16. D | 21. B | 26. B |
| 2. C | 7. A  | 12. C | 17. C | 22. C | 27. D |
| 3. C | 8. C  | 13. C | 18. D | 23. A | 28. B |
| 4. D | 9. B  | 14. A | 19. B | 24. A | 29. A |
| 5. B | 10. B | 15. D | 20. B | 25. B | 30. B |

**SECTION – II**

- |      |       |       |       |       |       |
|------|-------|-------|-------|-------|-------|
| 1. D | 6. A  | 11. B | 16. D | 21. A | 26. B |
| 2. A | 7. A  | 12. C | 17. B | 22. A | 27. A |
| 3. D | 8. C  | 13. D | 18. B | 23. C | 28. B |
| 4. B | 9. B  | 14. D | 19. A | 24. D | 29. B |
| 5. B | 10. B | 15. C | 20. D | 25. D | 30. D |

**Solutions**

**SECTION – I**

**Solutions for questions 1 to 12:**

1. From pattern method,  $\text{Rem} \left( \frac{18^2}{325} \right) = 324 \text{ or } -1$ .

$$\therefore \text{Rem} \frac{18^{323}}{325} = \text{Rem} 18 \times \frac{(18^2)^{161}}{325}$$

$$= 18 \times -1 = -18 \text{ or } 325 - 18 = 307. \quad \text{Choice (D)}$$

2. If a number has 15 factors, then it must either be of the form  $P^{14}$  or  $(P_1^2)(P_2^4)$  where  $P, P_1, P_2$  are prime numbers. The smallest number of the form  $P^{14}$  is  $2^{14} = 16384$  (a five digit number) and  $(P_1^2)(P_2^4) = 3^2 \times 2^4 = 144$ . Since, the given number is a four-digit number, it cannot be of the form  $P^{14}$ . So, it is of the form  $(P_1^2)(P_2^4)$ .  $\therefore$  The square of the number  $(P_1^4)(P_2^8)$  which has  $(4+1)(8+1)$  i.e. 45 factors.  $\quad \text{Choice (C)}$

3. It is given that  $S_{30} = 2 S_{20}$ . Considering the first term as  $a$  and the common difference as  $d$ , we get

$$\frac{30}{2}[2a + 29d] = 2\left(\frac{20}{2}\right)[2a + 19d]$$

$$\Rightarrow 15[2a + 29d] = 20[2a + 19d]$$

$$\Rightarrow 10a = 55d \Rightarrow 2a = 11d$$

$$\text{Now } \frac{S_{32}}{S_{42}} = \frac{32/2[2a + 31d]}{42/2[2a + 41d]}$$

$$= \frac{32[11d + 31d]}{42[11d + 41d]} = \frac{32[42d]}{42[52d]} = \frac{8}{13} \quad \text{Choice (C)}$$

4. Let the required square root be  $\sqrt{a} + \sqrt{b} + \sqrt{c}$

$$\text{Now, } (\sqrt{a} + \sqrt{b} + \sqrt{c})^2 = a + b + c + 2\sqrt{ab} + 2\sqrt{bc} + 2\sqrt{ac}$$

$$13 + \sqrt{48} + \sqrt{72} + \sqrt{96} = 13 + 2\sqrt{12} + 2\sqrt{18} + 2\sqrt{24}$$

$$= 13 + 2\sqrt{3 \times 4} + 2\sqrt{3 \times 6} + 2\sqrt{6 \times 4} = (\sqrt{3} + \sqrt{4} + \sqrt{6})^2$$

Therefore the square root is

$$\sqrt{a} + \sqrt{b} + \sqrt{c} = \sqrt{4} + \sqrt{3} + \sqrt{6}$$

$$\text{i.e. } 2 + \sqrt{3}(\sqrt{2} + 1)$$

Choice (D)

5. Since the overall weight loss is 25% and the heavier watermelon incurs a weight loss of 25%, the lighter watermelon also incurs a weight loss of 25%

Choice (B)

6. Let the cost of an apple, a banana and a chikoo be  $\text{₹}a$ ,  $\text{₹}b$  and  $\text{₹}c$  respectively.

$$3b - 4c + 8a = 48 \quad \text{--- (1)}$$

$$5b + 7c - 2a = 29 \quad \text{--- (2)}$$

$$4b + 3c + a = 31 \quad \text{--- (3)}$$

Let equation (1), (2) and (3) be multiplied by  $x, y, z$  respectively and added to get equal coefficients of  $a, b, c$ .

$$\Rightarrow 3x + 5y + 4z = -4x + 7y + 3z = 8x - 2y + z$$

$$\text{Solving, we get } \frac{y}{z} = \frac{-2}{3}$$

If  $y = -2$  and  $z = 3$  then  $x = -1$ .

$\Rightarrow$  Multiplying equation (1) by  $-1$  (2) by  $-2$  and (3) by 3 and adding we get,

$$-a - b - c = -13 \text{ or } a + b + c = \text{₹}13$$

Therefore the cost of one apple, one banana and one chikoo is  $\text{₹}13$   $\quad \text{Choice (A)}$

7. The product of the four digits will be 18 in the following ways.

$$\text{I } (1)(1)(2)(9) = 18$$

$$\text{II } (1)(1)(3)(6) = 18$$

$$\text{III } (1)(2)(3)(3) = 18$$

The number of four digit numbers that can be formed for the above cases are tabulated below.

Number of four digit numbers

$$\frac{4!}{2!} = 12$$

$$\frac{4!}{2!} = 12$$

$$\frac{4!}{2!} = 12$$

Therefore the total number of four-digit numbers such that the product of the digits is 18 is  $(12 + 12 + 12)$   
i.e. 36  
Choice (A)

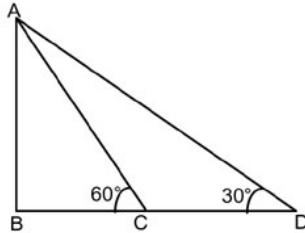
8.  $g(x) = \frac{-2}{3}f(x)$

Since  $f(x)$  and  $g(x)$  are of opposite signs, if  $f(x)$  attains a minimum, then  $g(x)$  attains a maximum, which is  $\frac{-2}{3}$  times the minimum value of  $f(x)$ .

The value of  $x$  at which  $f(x)$  attains its minimum is also the value of  $x$  at which  $g(x)$  attains its maximum, i.e., at  $x = 6$ .

$$\therefore \text{Maximum value of } g(x) = \frac{-2}{3} \times 36 = -24. \text{ Choice (C)}$$

9. Let the height of the light house, A B be  $\ell$  m.



$$\text{In the above figure, } BD = \frac{AB}{\tan 30^\circ} = \ell \sqrt{3} \text{ and}$$

$$BC = \frac{AB}{\tan 60^\circ} = \frac{\ell}{\sqrt{3}}$$

It is given that, the ship approached  $100\sqrt{3}$  m towards the light house, i.e., it covered CD or  $\left(1\sqrt{3} - \frac{\ell}{\sqrt{3}}\right)$  m

$$\text{Now } 1\sqrt{3} - \frac{\ell}{\sqrt{3}} = 100\sqrt{3}$$

$$\Rightarrow \frac{2\ell}{\sqrt{3}} = 100\sqrt{3}$$

$$\therefore \ell = 150 \text{ m}$$

Choice (B)

10. Let the number of units of work done by A, B and C independently in a day be  $a$  units,  $b$  units and  $c$  units respectively.

Considering the total work to be  $W$  units.

$$\text{Time taken by A to do the work} = \frac{W}{a}$$

$$\text{Time taken by B and C together} = \frac{W}{b+c}$$

$$\text{It is given that } \frac{W}{b+c} = \frac{1}{3} \frac{W}{a}$$

$$\Rightarrow 3a = b + c \quad \dots (1)$$

$$\text{Similarly } \frac{W}{a+b} = \frac{1}{2} \frac{W}{c}$$

$$\Rightarrow 2c = a + b \quad \dots (2)$$

$$\text{Solving (1) and (2), we get } b = \frac{5}{3}a \text{ and } c = \frac{4}{3}a$$

$$\text{Let } a = 3k$$

$$\therefore b = 5k \text{ and } c = 4k$$

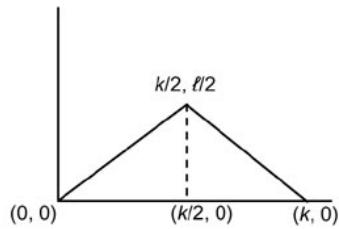
$$\text{B alone can do the work in } \frac{W}{5k} = 28 \text{ days}$$

$\therefore$  A and C together will take

$$\frac{W}{3k+4k} = \frac{(5k)(28)}{(7k)} = 20 \text{ days}$$

Choice (B)

11.



We can see that the triangle with the given vertices is an isosceles triangle (as  $k/2$  is the midpoint of  $(0, 0)$  and  $(k, 0)$ ) and the line joining  $(k/2, 0)$  and  $(k/2, l/2)$  is the altitude to the base. As the orthocentre is the point of concurrence of the altitudes it lies on the line which passes through the points  $(k/2, 0)$  and  $(k/2, l/2)$ . The equation of the line is  $x = k/2$ .

Choice (B)

12. As the well can hold 7,20,000 litres of water, the volume of well is  $7,20,000/1,000 = 720 \text{ m}^3$ .  
10% of the water (i.e.,  $72 \text{ m}^3$ ) can fill the remaining area upto 0.3 m.  
Thus remaining area  $\times 0.3 = 72$   
 $\Rightarrow$  Remaining area =  $240 \text{ m}^2$   
The area of the field (including well) =  $20 \times 15 = 300 \text{ m}^2$   
Area used for construction of well =  $300 - 240 = 60 \text{ m}^2$   
Volume of the well = Area  $\times$  Depth  
 $\Rightarrow 720 = 60 \times D \Rightarrow D = 12 \text{ m}$

Choice (C)

### Solutions for questions 13 to 15:

13.

	Edible oil	Sugar
1975-76	$\left(\frac{3.5}{2.7} - 1\right) \times 100 = 29.63\%$	$\left(\frac{6.1}{5.7} - 1\right) \times 100 = 7.02\%$
1985-86	$\left(\frac{5}{3.5} - 1\right) \times 100 = 42.86\%$	$\left(\frac{11.1}{6.1} - 1\right) \times 100 = 81.97\%$
1995-96	$\left(\frac{7}{5} - 1\right) \times 100 = 40\%$	$\left(\frac{14.1}{11.1} - 1\right) \times 100 = 27.03\%$
2000-01	$\left(\frac{8.2}{7} - 1\right) \times 100 = 17.14\%$	$\left(\frac{15.8}{14.1} - 1\right) \times 100 = 12.06\%$
2001-02	$\left(\frac{8.8}{8.2} - 1\right) \times 100 = 7.32\%$	$\left(\frac{16}{15.8} - 1\right) \times 100 = 1.27\%$
2002-03	$\left(\frac{7.2}{8.8} - 1\right) \times 100 = 18.18\%$	$\left(\frac{16.3}{16} - 1\right) \times 100 = 1.88\%$

The table above gives the percentage increase in per capita availability of sugar & edible oil over the previous period.

Only in the periods 1985-86 & 2002-03, did sugar exhibit a higher growth rate than edible oil with respect to per capita availability.

#### Alternative Solution:

With some quick calculations, the fact that sugar grew faster than edible oil in only 1985-86 can be figured by observation. Also in 2002-03, edible oil saw a negative growth, while sugar saw a positive growth. Choice (C)

14. Per capita production of coffee

$$= \frac{\text{Per capita availability of coffee}}{0.16}$$

$$\text{Per capita production of tea} = \frac{\text{Per capita availability of tea}}{0.80}$$

In 1965 – 66, difference in per capita production of

$$\text{coffee & tea are } \frac{72}{0.16} - \frac{346}{0.80} = \frac{360 - 346}{0.80} = \frac{16}{0.80} \text{ gm}$$

Similarly, the difference can be calculated for all the years, & tabulated as under

Year	Difference in per capita productions of coffee & tea (gm)
1965 – 66	$\frac{16}{0.80}$
1975 – 76	$\frac{136}{0.80}$
1985 – 86	$\frac{234}{0.80}$
1995 – 96	$\frac{371}{0.80}$
2000 – 01	$\frac{341}{0.80}$
2001 – 02	$\frac{315}{0.80}$
2002 – 03	$\frac{261}{0.80}$

∴ The per capita productions of coffee & tea were the closest in 1965 – 66  
Choice (A)

15. The highest percentage increase in any period with respect to the previous period was witnessed in 1985 – 86 in case of sugar.

$$\text{The \% increase was } \left( \frac{11.1}{6.1} - 1 \right) \times 100 = 81.97\% \\ \text{Choice (D)}$$

#### Solutions for question 16:

$$16. AD 4 \text{ i.e. } \frac{x}{A} E \\ \frac{x}{206}$$

E can be 4 or 9, but  $4 \times D + 1$  cannot end in zero, hence, E has to be 9.  
And also  $9 \times 4 = 36$   
 $\Rightarrow 9 \times D + 3$  ends in zero  $\Rightarrow D = 3$   
 $A \times 9 + 3 = A2$   
only possible value of A is A = 1  
 $\therefore A + E = 1 + 9 = 10$   
Choice (D)

#### Solutions for questions 17 and 18:

17. % share of the sales value of Tota in total sales value of the four brands in 1999-2000.

$$= \left( \frac{12500}{56000 + 18750 + 12500 + 20000} \right) \times 100 = 11.66\%$$

In 2000 – 01, it is

$$\left( \frac{17000}{59750 + 20000 + 17000 + 22500} \right) \times 100 = 14.26\%$$

In 2001 – 02, it is

$$\left( \frac{17750}{63500 + 22500 + 17750 + 22500} \right) \times 100 = 14.06\%$$

In 2002 – 03, it is

$$\left( \frac{21250}{69000 + 27750 + 21250 + 24000} \right) \times 100 = 14.97\%$$

In 2003-04, it is

$$\left( \frac{34000}{76000 + 30500 + 34000 + 26750} \right) \times 100 = 20.33\%$$

In 2004 – 05, it is

$$\left( \frac{44000}{84000 + 41500 + 44000 + 24000} \right) \times 100 = 22.74\%$$

∴ The second highest share of Tota was 20.33% in 2003-04  
Choice (C)

18. From 1999-2000 to 2003-04, % increase in sales value of

$$\text{Merk was } \left( \frac{76000 - 56000}{56000} \right) \times 100 = 35.71\%$$

$$\text{Indra was } \left( \frac{30500 - 18750}{18750} \right) \times 100 = 62.67\%$$

$$\text{Tota was } \left( \frac{34000 - 12500}{12500} \right) \times 100 = 172\%$$

$$\text{Bonda was } \left( \frac{26750 - 20000}{20000} \right) \times 100 = 33.75\%$$

∴ Bonda had the lowest % increase from 1999-2000 to 2003-04.  
Choice (D)

#### Solutions for questions 19 to 21:

19. As the shop keeper's books contain the digit 5, the base n, should be greater than 5. As  $51 \times 35$  in decimal system is more than 936, the base n, should be less than 10. Thus 'n' can be 6, 7, 8 or 9. In any of these bases the units digits of  $51 \times 35$  will be 5. Thus 936 when divided by 'n' should leave a remainder 5. 936 when divided by 6, 8 and 9 will leave a remainder of 0 and when divided by 7 leaves a remainder of 5. Thus n = 7,  $(51)_7$  is  $7^0 \times 1 + 7^1 \times 5 = 1 + 35 = 36$  in decimal system.  
Choice (B)

20. The side of the cube is limited by the lesser of the two values  $\left( \frac{\text{diameter of cylinder}}{\sqrt{2}} \right)$  or height of cylinder.

$$\text{We see that } \frac{30}{\sqrt{2}} > 20$$

$\Rightarrow$  maximum side of cube = 20 cm and its volume = 8000 cm<sup>3</sup>.  
Choice (B)

21.  $\log_2(3^x - 15) - \log_2 3 = \log_2(3^x + 21) - \log_2(3^x - 15)$   
 $\Rightarrow 2 \log_2(3^x - 15) = \log_2 3(3^x + 21)$   
 $\Rightarrow \log_2(3^x - 15)^2 = \log_2 3(3^x + 21)$   
 $\Rightarrow (3^x)^2 - 33(3^x) + 162 = 0, (3^x - 6)(3^x - 27) = 0$   
 $3^x = 6 \text{ or } 27$   
If  $3^x = 6$ ,  $3^x - 15$  would be negative and  $\log_2(3^x - 15)$  would be undefined. If  $3^x = 27$ ,  $x = 3$ .  
Choice (B)

#### Solutions for questions 22 to 25:

##### Marks obtained by Ramesh

Section	Marks
QA	60
DI	30
DS	15
VA	45
RC	75
LA	75

Let the total number of 1-mark questions be x and 2-mark questions be y.

Now, the number of questions in each of the sections is as follows:

$$x + y = 500 \\ 0.15x + 0.20y = 80 \\ = 0.15(x + y) + 0.05y = 80 \\ \Rightarrow 0.05y = 80 - 75 = 5 \\ \Rightarrow y = 100 \text{ and } x = 400$$

Section	1-mark	2-mark	Total
QA	60	20	80
DI	40	5	45
DS	80	15	95
VA	80	30	110
RC	80	10	90
LA	60	20	80

$$\frac{400(x)}{400(y)} \quad \frac{100(y)}{500}$$

22. Ramesh got 75 marks in LA. Total number of 1-mark questions in LA is 60. He can attempt correctly a maximum of 59 1-mark questions in LA. So, he has to get remaining 16 marks from 2-mark questions in LA. So, a minimum of 8 questions of 2-mark must have been attempted correctly by Ramesh. A maximum of 284 1-mark questions could be attempted.  
Choice (C)

23. Total number of 1-mark questions = 400  
Total number of 2-mark questions = 100  
 $\Rightarrow$  Maximum total marks =  $400 \times 1 + 100 \times 2 = 600$   
Choice (A)

24. Ramesh got 30 marks in DI and there were 5 questions of 2-mark type in DI. He may attempt all those 5 questions and the remaining 20 marks must be from 1-mark questions.  
 $\therefore$  Minimum number =  $5 + 20 = 25$       Choice (A)

25. In DI, only 5 questions (of 2-mark type) were there but in LA, 20 questions (of 2-mark type) were there. From solution to Q75, he must correctly attempt a minimum of 8 questions out of these. So, the number of 2-mark questions attempted correctly in DI (Whatever the number may be) has to be less as compared to LA. Choice (B)

#### Solutions for questions 26 to 30:

26. Given, A(-3, 2) and B(6, 5)  
The slope of the line AB is,

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 2}{6 - (-3)} = \frac{3}{9} = \frac{1}{3}$$

$\therefore$  The equation of the line AB is,  $y - y_1 = m(x - x_1)$

$$\text{i.e., } y - 2 = \frac{1}{3}(x - (-3)) \text{ i.e., } 3y - 6 = x + 3$$

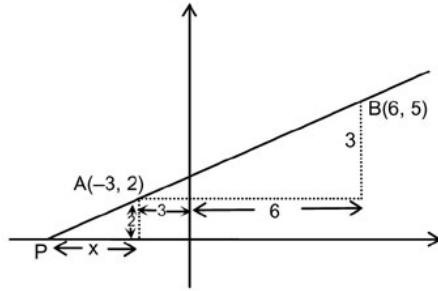
$$\text{i.e., } x - 3y + 9 = 0$$

Now, substituting  $y = 0$  in the above equation,  
we get  $x - 0 + 9 = 0 \Rightarrow x = -9$

As the line AB intersects the x-axis at P,  $P = (-9, 0)$ .

$$\therefore PA = \sqrt{(-9 - (-3))^2 + (0 - 2)^2} = \sqrt{36 + 4} = 2\sqrt{10} \text{ units}$$

#### Alternative solution:



From B to A, for a vertical movement downwards of 3 units, the horizontal distance covered is 9 units, i.e., for every 1 unit movement along negative y direction, there is a movement of 3 units along negative x direction.

From A to P, there is a downward movement of 2 units  
 $\Rightarrow$  A horizontal movement of  $2 \times 3 = 6$  units.

$$\therefore x = 6.$$

$$\therefore PA = \sqrt{2^2 + 6^2} = 2\sqrt{10} \quad \text{Choice (B)}$$

27. Let the amount Amit will pay at the end of each year be k. The present value of all the amounts paid is equal to the loan amount.

$$3,31,000 = \frac{k}{\left(1 + \frac{r}{100}\right)} + \frac{k}{\left(1 + \frac{r}{100}\right)^2} + \frac{k}{\left(1 + \frac{r}{100}\right)^3}$$

$$\begin{aligned} &= k \left( \frac{1}{1.1} + \frac{1}{1.21} + \frac{1}{1.331} \right) \\ &= k \left[ \frac{1.21 + 1.1 + 1}{1.331} \right] = \frac{3.31}{1.331} \\ &k = 3,31,000 \times \frac{1.331}{3.31} = 1,33,100 \end{aligned}$$

#### Alternative Solution:

$$\begin{aligned} \text{Each instalment} &= \frac{p.r}{100 \left[ 1 - \left\{ \frac{100}{(100+r)} \right\}^n \right]} \\ &= \frac{3,31,000 \times 10}{100 \left[ 1 - \left\{ \frac{100}{110} \right\}^{23} \right]} = 1,33,100 \quad \text{Choice (D)} \end{aligned}$$

28. Each term of the series is in the form of (1/two factors). The first factors of the denominators form one AP and the second factors form another AP. Hence, the general form of the factors is

$$\text{i) } 5 + \overline{x-1} 3 = (3x + 2) \text{ and}$$

$$\text{ii) } 8 + \overline{x-1} 3 = (3x + 5)$$

$$\Rightarrow t_x = \frac{1}{(3x+2)(3x+5)} \text{ where } x = 1, 2, 3, \dots \rightarrow (1)$$

$$\text{The last term} = \frac{1}{(242)(245)} = \frac{1}{[3(80)+2][3(80)+5]} \rightarrow (2)$$

$t_x$  can be written as:  $t_x$

$$\begin{aligned} &= \frac{1}{(3x+2)(3x+5)} = \frac{1}{3} \left[ \frac{(3x+5) - (3x+2)}{(3x+2)(3x+5)} \right] \\ &= \frac{1}{3} \left[ \frac{1}{3x+2} - \frac{1}{3x+5} \right] \rightarrow (3) \end{aligned}$$

$\therefore$  Sum of the given series

$$\begin{aligned} &= \frac{1}{3} \left[ \frac{1}{5} - \frac{1}{8} + \frac{1}{8} - \frac{1}{11} + \dots + \frac{1}{242} - \frac{1}{245} \right] \\ &= \frac{1}{3} \left[ \frac{1}{5} - \frac{1}{245} \right] = \frac{1}{3} \left( \frac{1}{5} \right) \left[ 1 - \frac{1}{49} \right] = \frac{48}{15(49)} = \frac{16}{245} \end{aligned}$$

Choice (B)

29.

	Ajay	Bina
Income	$5x$	$4x$
Expenditure	$6y$	$5y$

Savings	$7z$	$5z$
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Income = Expenditure + Saving

$$\therefore 5x - 6y = 7z \dots (1)$$

$$4x - 5y = 5z \dots (2)$$

5(1) - 6(2) gives

$$25x - 24x = 35z - 30z$$

$$\Rightarrow x = 5z$$

$$\Rightarrow \frac{z}{x} = \frac{1}{5} \dots (3)$$

$$\therefore \text{Ajay saves } \frac{7z}{5x} = \frac{7}{5} \left( \frac{1}{5} \right) \times 100 = 28\% \quad \text{Choice (A)}$$

$$30. \log_2 x - \log_2 \left( \frac{8}{\sqrt{y}} \right) = \frac{1}{2} \log_2 x - (\log_2 8 - \log_2 \sqrt{y}) \\ = \frac{1}{2} [\log_2 x + \log_2 y] - \log_2 y = \frac{1}{2} \log_2(xy) - 3$$

This is maximum when  $xy$  is maximum.  
Given  $\log_2 x - 7 = \log_2 5 - y \Rightarrow x - 7 > 0$  and  $5 - y > 0$   
 $\Rightarrow x > 7$  and  $y < 5$   
 $\therefore xy$  is maximum when  $x = 8$  and  $y = 4$   
 $\therefore$  Maximum value of  $xy = 8 \times 4 = 32$ .

$$\therefore \frac{1}{2} \log_2 xy - 3 = \frac{1}{2} \log_2 32 - 3 = \frac{5}{2} - 3 = -0.5$$

Choice (B)

<b>Difficulty level wise summary - Section I</b>	
Level of Difficulty	Questions
Very Easy	-
Easy	4, 5, 15, 29
Medium	1, 2, 3, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21, 26, 27
Difficult	6, 20, 22, 23, 24, 25, 28, 30
Very Difficult	-

## SECTION – II

### Solutions for question 1:

1. It is clear that the subject of the paragraph is anemia. We can see that A follows C-'More severe anemia' follows 'anemia' in C. B precedes C A giving reason for the occurrence of anemia. D appears to follow with 'these' but 'changes' are not mentioned in the para. Further D with reference to mitochondria and surface membrane is more detail-oriented than B C A which are general in nature. Choice (D)

### Solutions for questions 2 to 4:

2. (b) has the topic of the passage. (d) develops the idea in (b), by giving the reason for it. (c) is the consequence of (d). (e) tells us that the proposal to calm them was rejected and (a) gives the support for their demands. bdcea.  
Choice (A)
3. (b) is a general statement. (d) clearly follows (b) as it gives an example for what is given in (b). (c) continues (b) as it mentions that it followed Oldowan tools. (a) follows (c) and (e) concludes linking back to 'cognitive' mentioned in 'b'. Hence bdcae.  
Choice (C) places 'e' before 'a'. This would be an insertion of the new thought before the one being discussed is complete.  
Choice (D)
4. The opening statement is (d). (a) supports the idea. (e) further supports it with an example. (c) compares two states and (b) concludes it. Hence daecb. Choice (B)

### Solutions for questions 5 to 7:

#### Number of words and Explanatory notes for RC:

Number of words : 538

5. The theme of the book is encapsulated in "New Horror was Born" (Para 2, end) thus, choice (B) is apt. The first sentence of para 2 points to 'how ..... came to be ..... who made them', making choice (B) apt. Choice (A) is introductory in nature. Choice (C) presents the cultural aspects of horror films, while the passage focuses on how the films were made. Choice (D) goes beyond the scope of the passage  
Choice (B)
6. Choice (A) is not mentioned, Samuel Beckett is a play right, while Michael Myers is a fictional character from "Halloween".

Choice (B) cannot be inferred. The last two lines of para 4 does not say that Exorcist is an adaptation. Choice (C) cannot be inferred from the words 'Waiting for Godot in space' (last sentence of para 4). Choice (D) can be inferred from the first sentence of para 4. Choice (A)

7. The author concludes that Zinoman does not discuss how the "DNA" of horror films mutated into the pathetic forms seen today. (last para). He does not bring the larger picture into focus. Choice (A) reflects this state of affairs-not provide "an overarching structure" (penultimate para). Choice (B) is comprehensively discussed. So are choices (C) ("what the new Horror movies share") and (D) ("that kind of personal insights"). Choice (A)

### Solutions for questions 8 to 11:

#### Number of words and Explanatory notes for RC:

Number of words : 535

8. (A) is a cause, since it is stated that the MMS report found a significant increase in the number of blowouts associated with cementing (last para).  
(B) is a cause in a very obvious way as blowout preventers do exactly that.  
(C) is not a cause as 'preventing' can avert a blow out.  
(D) can be inferred to be a cause since freezing temperatures at the seafloor will cause gases to freeze. 'Unstable' indicates that they may lead to explosions.  
Choice (C)
9. Choices B and D seem possible answers. Choice B is the better answer because oil companies are in deep water drilling because it has been productive. Mere availability (choice D) is not sufficient - the ability to tap it is needed.  
Choice (B)

10. The reference to soda bottle comes at the end of para 1 - 'they're like ..... waiting for some one to pop the top'. The end of the sentence points to an explosion when someone does something (wrong). Choice D is ruled out because the reference is to deep sea drilling whereas choice D (undersea drilling) would include shallow water drilling also. The emphasis is on not doing something wrong, hence B.  
Choice (B)

11. (A) is not supported by the passage. Safety measures according to the passage are in place, specially highlighted by the fact that only 39 blowouts occurred during the drilling of more than 15,000 oil and gas wells in the Gulf (A) is the untrue. (C) has not been stated in the passage. On the contrary the passage states ..that 'the methods for preventing blowouts..... did not keep pace'. D has not been stated. Only B is true.  
Choice (B)

### Solutions for questions 12 to 14:

12. Remember that we are looking for an answer that completes the paragraph. (C) is apt. 'Most' judges would refer to both the 'Supreme Court and High Court judge'. It also rounds off the paragraph with the 'defense' and the reason 'working hard'. (A) is specific to Supreme court judges and inconclusive with simply 'not be judged by', without information regarding what they should be judged by. (B) comes without any proper foundation being laid and needs more introduction. In (D), who is referred to as 'they' is not clear.  
Choice (C)

13. The paragraph largely talks about globalization and commercialization and loss of age-old values. The penultimate sentence says '..... seems just a distraction' which means that in reality it has not lost its appeal. So choice (D) concludes the para. Choice (B) with reference to polato chips and You Tube catches attention but 'seem' in the penultimate sentence rules it out.  
Choice (D)

14. 'Changing demography' in (C) is out of scope here, as we are referring to a city as a single entity. (B) is too specific with 'DNA' as the penultimate sentence is in its incipient stage. The paragraph is about the relation between the 'city' and its residents which is 'forged', and hence 'symbiotic' So (D) is the answer. (A) merely reiterates what the penultimate sentence says. Choice (D)

#### Solutions for questions 15 to 17:

##### Number of words and Explanatory notes for RC:

Number of words : 590

15. The last line says disasters are inevitable but then consequence need not be that is we can take preventive steps to contain or limit the damage caused by a natural disaster. Choice (C)

16. Refer to the third para where the first sentence refers to the truth being 'more encouraging'. The last sentence of the para backs choice D. The second part of choice A is incorrect. Choice B is also incorrect. In choice C, while the effect 'spreads' they don't 'spread thin' (weaken). Choice (D)

17. Choice B is not recommended by the author since he feels urbanisation helps people to earn more. Choice D is backed by the penultimate para. Choice (B)

#### Solutions for questions 18 to 20:

From (i), Joe < Jack.

From (ii), Jughead < Jane < Joseph (Jane's and Jughead's flats must be on consecutive floors)

From (iii), Joe < Joseph (Both their flats are on consecutive floors). From (iv), Jughead < Jatin < John (John's and Jatin's flats are on consecutive floors)

From (v), Jill < Jatin

From (i) and (iii), Joe < Joseph < Jack

Now, from the above information, either Jack's or John's flat must be on the eighth floor and Jatin's flat must be on the seventh floor (from (iv)) and from above, Jack's flat must be on the sixth floor.  
∴ Jughead's or Jill's flat must be on the first floor.

##### Case (i)

Jill's flat is on first floor.

As Jane's flat is below Joseph's flat, Joseph's flat must be on fifth floor, Joe's flat must be on fourth floor. From (iii), Jane's flat must be on third floor and Jughead's flat must be on second floor.  
∴ Jill < Jughead < Jane < Joe < Joseph < Jack < Jatin < John

##### Case (ii)

Jughead's flat is on first floor.

⇒ Jane's flat must be on second floor. Jill's flat can be on fifth or third floor.

There are two possibilities.

- (i) Jughead < Jane < Joe < Joseph < Jill < Jack < Jatin < John  
(ii) Jughead < Jane < Jill < Joe < Joseph < Jack < Jatin < John.

18. Jack owns a flat on the sixth floor. Choice (B)

19. Jill's flat is not below Joe's flat.  
⇒ Joseph owns a flat on fourth floor. Choice (A)

20. Jughead owns a flat on first or second floor.  
Choice (D)

#### Solutions for questions 21 to 23:

From (i) Satish > Mahesh and Rajesh > Harish

From (ii), Divya > Kavya > Anusha

From (iv), Divya is ranked 2nd ⇒ Shruti is ranked 1<sup>st</sup>.

∴ Shruti > Divya > Kavya > Anusha

(1) (2) (3) (4)

From (iii) and (iv), the pairings are as below.

Shruti  
Divya – Satish  
Kavya  
Anusha – Harish  
From (i), since Satish is ranked higher than Mahesh  
⇒ Mahesh is paired with Kavya  
⇒ Rajesh is paired with Shruti.  
. The final pairings and rankings are as below.

Rank	Male	Female
1	Rajesh	Shruti
2	Satish	Divya
3	Mahesh	Kavya
4	Harish	Anusha

21. Mahesh is ranked 3<sup>rd</sup> among males. Choice (A)  
22. Mahesh is paired with Kavya. Choice (A)  
23. The decreasing order of salaries is Rajesh, Satish, Mahesh and Harish. Choice (C)

#### Solutions for questions 24 and 25:

24. In 1<sup>st</sup> sentence, 'wade' relates to a moat which means a ditch filled with water. Mote means a tiny spot. Hence b  
An assassination is perpetrated (carry out a bad action) but not perpetuated (cause to continue for a long time). Hence a.  
Perspicacity is the ability to understand. Hence b.  
The sentence clearly indicates that the word is a noun. Dinghy is a small boat and dingy means gloomy. Hence a.  
The fifth sentence talks about not wasting money. So the choice should be prodigal. Hence a.  
So babaa  
Choice (D)

25. Prostrate is to lie stretched out on the ground. Prostate is a gland. Hence b.  
The 2<sup>nd</sup> sentence talks about discarding something. So it should be lumber (disused articles of furniture) but not lumbar (relating to lower part of back) hence a.  
In the 3<sup>rd</sup> sentence the word should be a verb whereas loath is an adjective meaning reluctant. Hence loathe b.  
The 4<sup>th</sup> sentence talks about a bird. So it should be martin not marten (a forest animal) hence b.  
Swatting means to hit or crush with a flat object. eg. Swat a fly. Swotting means to study hard so swotting fits in this context, hence a.  
Choice (A) babba  
Choice (D)

#### Solutions for questions 26 to 28:

From (ii), it can be said that one party among NPC, TCM, JPB and PPC must have won 50 seats.

From (i), it can be said that  $25 + 50 = 30 + 45$

∴ NIC must have won 40 seats

From (iii), the following cases are possible.

	NPC	TCM	JPB	PPC	NIC
Case (i)	50	25	30	45	40
Case (ii)	45	30	25	50	40

26. If TCM did not secure the least number of seats, then case (ii) holds good. The minimum difference in the seats secured between any two political parties is 5.  
The difference in the seats of  
(i) TCM and PPC = 20  
(ii) NPC and NIC = 5  
(iii) JPB and TCM = 5  
(iv) NIC and JPB = 15  
∴ The difference is the minimum for two pairs.  
Choice (B)

$$27. \frac{2}{3} \times 190 = 126.67$$

∴ Minimum seats to form government = 127.

Together, NPC, PPC and NIC have won 135 seats and hence have a definite chance for forming the government.

Choice (A)

28. If 5 seats of PPC are awarded to NIC after recounting, the distribution would be as follows.

	NPC	TCM	JPB	PPC	NIC
Case (i)	50	25	30	40	45
Case (ii)	45	30	25	45	45

Since no parties have won the same number of seats after recounting, case (ii) is ruled out.

∴ PPC has won 40 seats. Choice (B)

30. Statement d is incorrect because the pronoun 'its' does not agree with the plural subject adults. It should be replaced by the pronoun 'their'. In statement e the expression '....in Kangaroo island is incorrect; the correction is '.....on Kangaroo island.' Statements a, b and c are free of errors.

Choice (D)

**Solutions for questions 29 and 30:**

29. In 'a' the usage of the word oasis is incorrect. Since the reference is to the oases in Egypt and those of Russia, the word should be in the plural. Therefore the correction is '.....the font of fabled oases.....'. In statement 'e', the word 'working' should be in the plural. The word 'workings' refers to the way that something operates. Therefore a and e are erroneous and b, c and d are correct. Choice (B)

<b><i>Difficulty level wise summary - Section II</i></b>	
<b>Level of Difficulty</b>	<b>Questions</b>
<i>Very Easy</i>	—
<i>Easy</i>	21, 22, 23
<i>Medium</i>	1, 2, 3, 4, 12, 14, 15, 16, 17, 18, 19, 20 24, 26, 27, 28, 30
<i>Difficult</i>	5, 6, 7, 8, 9, 11, 13, 25, 29
<i>Very Difficult</i>	10