

CAT 2014 SOLVED PAPER

(Memory Based)

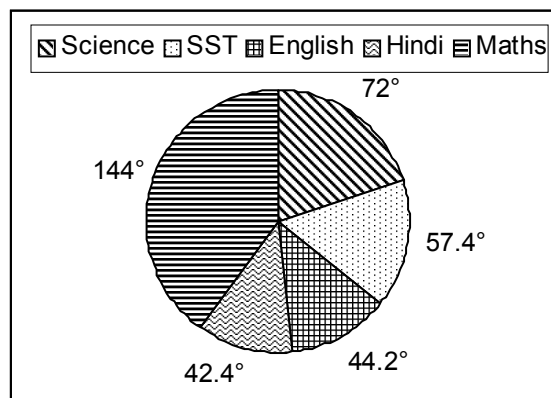
Section I : QA & DI

- How many rectangles with integral sides are possible where the area of the rectangle equals the perimeter of the rectangle?
 - One
 - Three
 - Two
 - Infinitely many
- AC is a chord of a circle whose centre is at O. If B is any point on the arc AC and $\angle OCA = 20^\circ$, then the magnitude of $\angle ABC$ is
 - 110°
 - 70°
 - 140°
 - Either (a) or (b)
- An equation with all positive roots is written as $x^n + a_n x^{n-1} + a_{n-1} x^{n-2} + \dots + a_1 = 0$. Which of the following is necessarily true?
 - $a_n^n \geq n^n \times a_1$
 - $n^n \geq a_n^n \times a_1$
 - $a_1^n \geq n^n \times a_n$
 - None of these
- If $X = \sum_{i=1}^{i=n} \log_{10}(i) - \sum_{j=1}^{j=p} \log_{10}(j) - \sum_{k=1}^{k=(n-p)} \log_{10}(k)$, where $p \leq n$, then the maximum value of X for $n = 8$ is:
 - $1 + \log_{10} 24$
 - $\log_{10} 56$
 - $1 + \log_{10} 7$
 - $1 + \log_{10} 48$
- A ray of light along the line $\sqrt{3}x + y = \sqrt{3}$ gets reflected on the x-axis to become a ray along the line
 - $y = x + \sqrt{3}$
 - $\sqrt{3}y = x - 1$
 - $y = \sqrt{3}x - \sqrt{3}$
 - $\sqrt{3}y = x - \sqrt{3}$
- A shopkeeper sells four qualities of rice A, B, C and D having cost price Rs. 40/kg, Rs. 55/kg, Rs. 50/kg and Rs. 65/kg respectively. Ankit purchased 'a' kg of A and 'b' kg of B to make 'a + b' kg of a new quality 'E' of rice worth Rs. 50/kg. Then he purchased 'c' kg of C and 'd' kg of D to make 'c + d' kg of a new quality 'F' of rice worth Rs. 60/kg. Finally he took 'x' kg of rice and 'y' kg of rice from 'E' quality of rice and 'F' quality of rice respectively to make 'x + y' kg of rice worth Rs. 53/kg. Ensuring that a, b, c, d, x and y are all integers then what is the minimum value of a + b + c + d + x + y in kg?
 - 28
 - 22
 - 16
 - 26
- If $f(n) = 1^4 + 2^4 + 3^4 + \dots + n^4$, then how can $1^4 + 3^4 + 5^4 + \dots + (2n-1)^4$ be expressed?
 - $f(2n-1) - 16 \times f(n)$
 - $f(2n-1) - 8 \times f(n)$
 - $f(2n) - 16 \times f(n)$
 - $f(2n) - 8 \times f(n)$

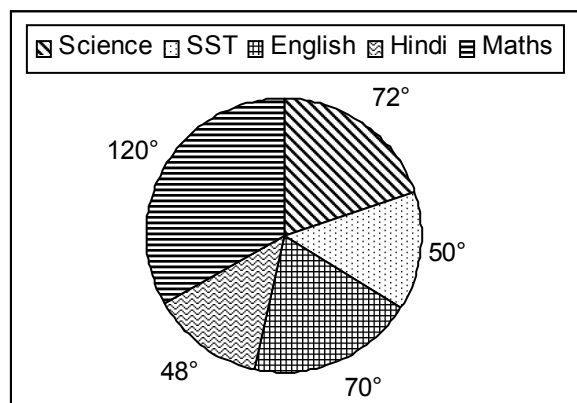
Directions for questions 8 to 11: Answer the questions on the basis of the information given below.

The subject wise breakup of the marks obtained by 4 students in 5 subjects during their board examination is given below. Assume that all subjects carry equal maximum marks unless specified.

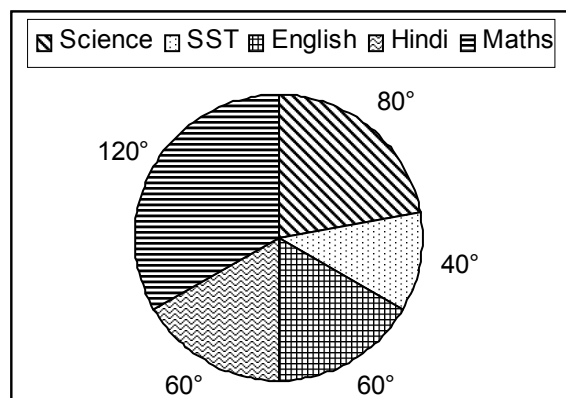
Geoffrey



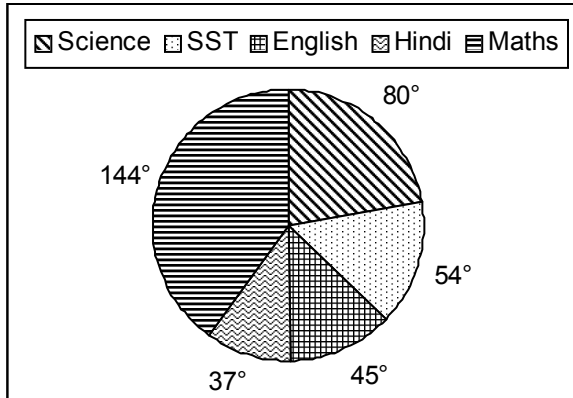
Tommen



Arya



Sansa



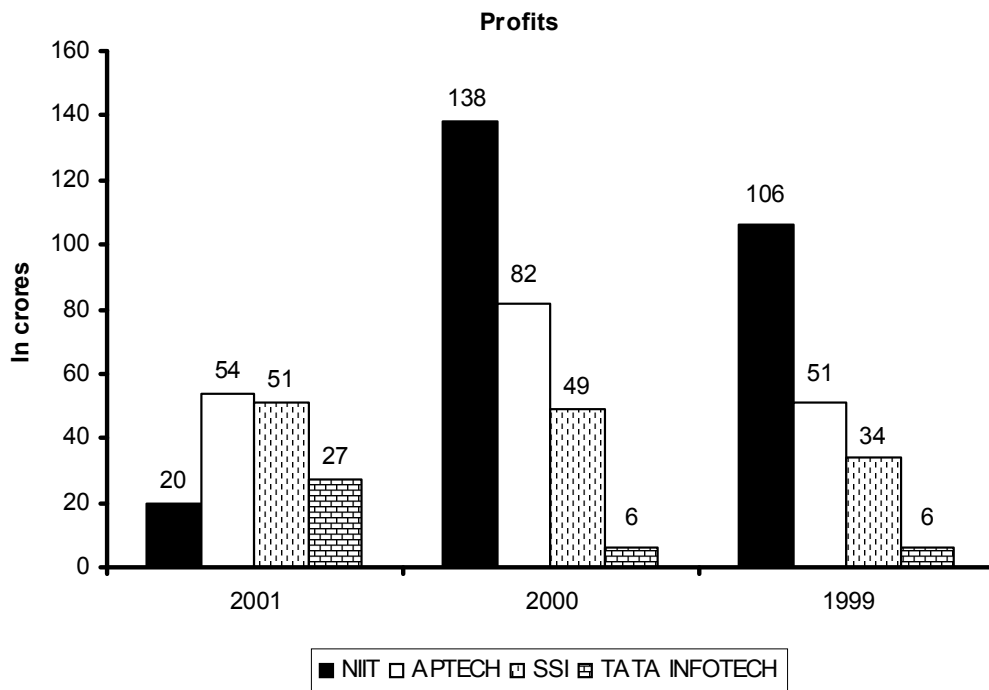
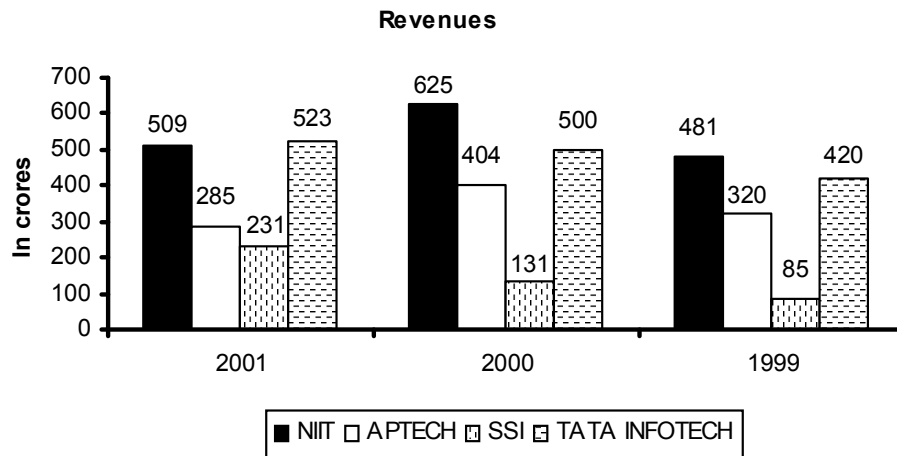
8. If the minimum percentage required to pass in any subject is 33.33 and it is also known that Arya passed in all the subjects, then what can be the minimum percentage that she can score in English?
- (a) 30% (b) 40%
(c) 50% (d) 60%
9. If the pattern of the examination is changed in such a way that the maximum marks for Maths is double of the maximum marks for any other subject (the breakup of marks remaining unchanged), then what is the ratio of maximum marks, in all the subjects put together, which Geoffrey can score to the maximum marks, in all the subjects put together, which Tommen can score?
- (a) 4 : 3 (b) 1 : 1
(c) 3 : 4 (d) 1 : 2
10. If the pattern of the examination is changed in such a way that the maximum marks for Maths is double of the maximum marks for any other subject (the breakup of marks remaining unchanged), then what is the ratio of maximum marks, in all the subjects put together, which Sansa can score after the change in pattern and before the change in pattern?
- (a) 35 : 54 (b) 3 : 2
(c) 2 : 3 (d) 9 : 5
11. If the marks scored by Geoffrey in Maths is maximum possible then what is the average of percentage marks scored by him in all the subjects?
- (a) 50%
(b) 25%
(c) 10%
(d) 12.5%
12. There are exactly sixty chairs around a circular table. There are some people sitting on these chairs in such a way that the next person to be seated around the table will have to sit next to someone. What is the least possible number of people sitting around the table currently?
- (a) 10 (b) 20
(c) 30 (d) 40
13. The number of APs with 5 distinct terms that can be formed from the first 50 natural numbers is
- (a) 325 (b) 300
(c) 375 (d) 288
14. If p is the probability of head turning up in the toss of a coin (not necessarily fair) and q is the probability of a tail turning up. Find the minimum possible value of $X = pq + \left(\frac{1}{p}\right)\left(\frac{1}{q}\right)$.
- (a) 4.25 (b) $2\sqrt{5}$
(c) 2 (d) None of these
15. A trader used to make 5% profit on an item by selling it at the usual marked price. One day, he tripled the marked price of the item and finally offered a discount of 30%. Find the percentage profit he made on the item that day.
- (a) 120.5% (b) 100%
(c) 94.5% (d) None of these
16. Find the range of 'x' if $\frac{1}{|x| - 2} < 0.5$
- (a) $x < -4$
(b) $(x > 4) \cup (x < -4)$
(c) $(x < -4) \cup (-2 < x < 2) \cup (x > 4)$
(d) $-2 < x < 2$
17. The sum of the coefficients of the polynomial $(x - 1)^9 (x - 2)^4 (x - 4)$ is
- (a) 0 (b) 16
(c) -20 (d) None of these
18. The ratio of two numbers whose LCM is 600 is 7 : 8. What is the LCM of the given two numbers?
- (a) 1120
(b) 560
(c) 2240
(d) 1152

Direction for questions 19 to 22: Answer the questions on the basis of the information given below.

The graphs given below show the revenues and profits of four IT education companies.

Profitability = (Profit/Revenue)

Total cost = Revenue – Profit



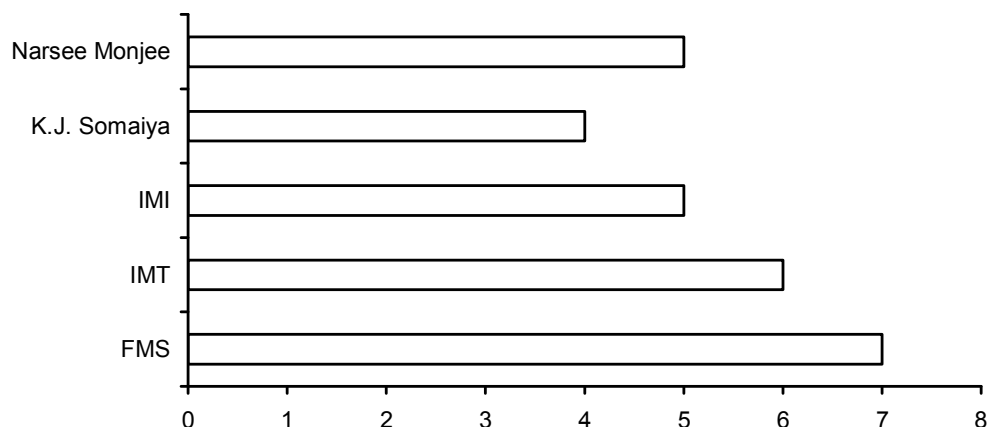
19. In 1999, how many companies have a profitability less than the average of the profitabilities of the four companies?
 - (a) 1
 - (b) 2
 - (c) 3
 - (d) 0
20. In 2002, if the cost in each company increased by 10% over 2001 and the revenue for each company decreased by 10% over 2001, what is the approximate profitability of all the companies taken together in 2002?
 - (a) 10.25%
 - (b) -10.25%
 - (c) -9.25%
 - (d) 8.75%
21. Arrange the companies in increasing order of their profitability in 2001.
 - (a) NIIT, Tata Infotech, Aptech, SSI
 - (b) NIIT, Tata Infotech, SSI, Aptech
 - (c) NIIT, Aptech, Tata Infotech, SSI
 - (d) SSI, Aptech, Tata Infotech, NIIT
22. Which company has the highest profitability in 2000?
 - (a) NIIT
 - (b) Aptech
 - (c) SSI
 - (d) Tata Infotech

23. The length of the hypotenuse of a right-angled triangle is 240 units. The perimeter of the given triangle is a perfect square. If the perimeter of the given triangle is greater than 550 units, then which of the following can be the length of a side of the given right-angled triangle?
- (a) 192 units (b) 168 units
(c) 144 units (d) Both (a) and (c)
24. What is the sum of the roots of all the quadratic equations that can be formed such that both the roots of the quadratic equation are common with the roots of equation $(x - a)(x - b)(x - c) = 0$?
- (a) $3(a + b + c)$ (b) $2(a + b + c)$
(c) $(a + b + c)$ (d) $4(a + b + c)$
25. 'f' is a real function such that $f(x + y) = f(xy)$ for all real values of x and y. If $f(-7) = 7$, then the value of $f(-49) + f(49)$ is
- (a) 7 (b) 14
(c) 0 (d) 49
26. ABCD is a rectangle with points E and F lying on sides AB and CD respectively. If the area of quadrilateral AEFB equals the area of quadrilateral CDEF, then which of the following statements is necessarily false with respect to the rectangle ABCD?
- (a) Length of AE is always equal to the length of CF.
(b) If the length of BC is 4 units, then the smallest integral length of EF is 5 units.
(c) Length of AE is equal to the length of DF.
(d) $\angle AEF = \angle EFC$.
27. If $\log_3 2$, $\log_3(2^x - 5)$ and $\log_3\left(2^x - \frac{7}{2}\right)$ are in Arithmetic Progression, then x is equal to
- (a) 2 (b) 3
(c) 2 or 4 (d) 2 or 3
28. An empty metal container (without its handle) weighs 15% of what it weighs when completely filled with a particular liquid. After adding the handle, the weight of the fully filled container increases by 5%. If the weight of a partly filled container is $\frac{1}{3}$ of the completely filled container with the handle attached, then what fraction of container is utilized?
- (a) $\frac{4}{17}$ (b) $\frac{3}{17}$
(c) $\frac{6}{19}$ (d) $\frac{3}{19}$
29. $P = \frac{1}{1! + 2!} + \frac{1}{2! + 3!} + \frac{1}{3! + 4!} + \dots + \frac{1}{9! + 10!}$. Find the value of P.
- (a) $\frac{1}{2!} - \frac{1}{11!}$ (b) $\frac{1}{2!} - \frac{1}{10!}$
(c) $\frac{1}{1!} - \frac{1}{10!}$ (d) $\frac{1}{1!} - \frac{1}{11!}$
30. P, Q and R start walking from the same point. P and Q start at 1 PM and R starts at 3 PM. R takes over P at 5 PM and then doubles his speed and takes over Q after another hour. What is the ratio of speed of A and speed of B?
- (a) 8 : 5 (b) 3 : 4
(c) 4 : 3 (d) 5 : 8

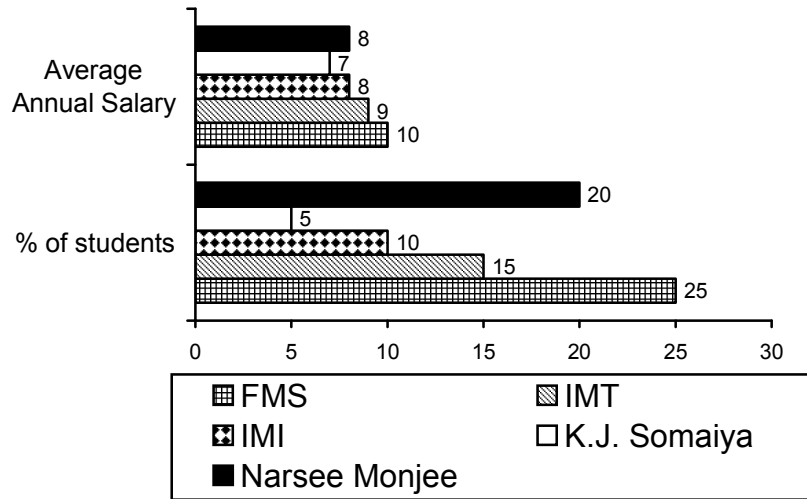
Directions for questions 31 to 33: Answer the questions on the basis of the information given below.

The average annual salary figures of five leading B-schools have been shown below.

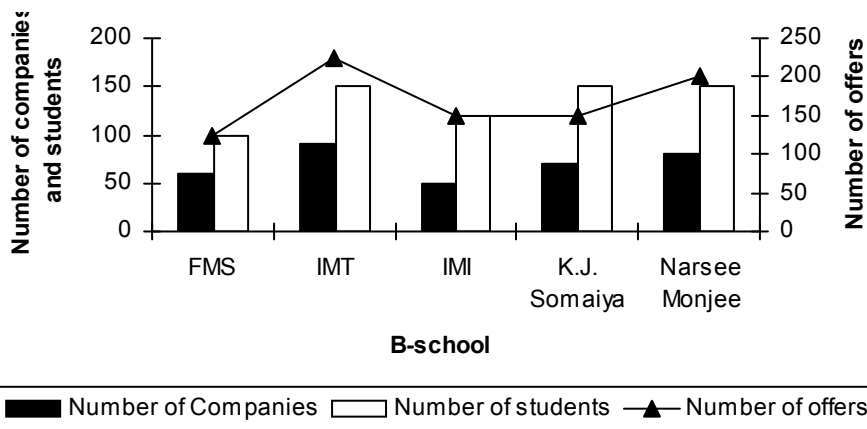
Average Annual Salary (Rs. in lakh)



The percentage of students getting PPOs (Pre-Placement offers) and their average annual salary in lakhs is shown below.



The number of students, the number of companies visiting the campus and total offers made (including PPO's) have been shown below for these five leading B-schools.

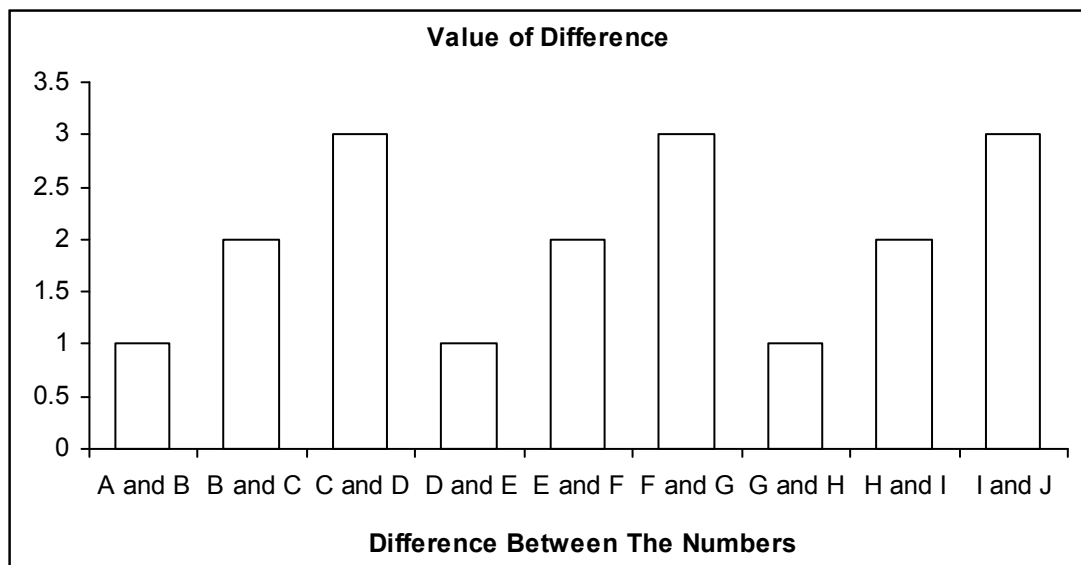


31. Which school has the highest total number of offers per student?
 - (a) IMT
 - (b) Narsee Monjee
 - (c) IMI
 - (d) FMS
32. The ratio of number of offers to the number of companies visiting the campus is highest for:
 - (a) IMT
 - (b) K.J. Somaiya
 - (c) IMI
 - (d) FMS
33. At FMS, what is the average salary of students, who did not get a PPO?
 - (a) Rs. 6.5 lakh
 - (b) Rs. 4.5 lakh
 - (c) Rs. 8 lakh
 - (d) Rs. 6 lakh
34. The sequence P_1, P_2, P_3, \dots is defined by $P_1 = 211, P_2 = 375, P_3 = 420, P_4 = 523$, and $P_n = P_{n-1} - P_{n-2} + P_{n-3} - P_{n-4}$ for all $n \geq 5$. What will be the value of $P_{531} + P_{753} + P_{975}$?
 - (a) 898
 - (b) 631
 - (c) 364
 - (d) 544
35. The top and bottom radii of a frustrum of a solid cone are 3 cm and 6 cm respectively. Its height is 8 cm. There is a conical cavity of height 3 cm and radius 6 cm at the bottom. The amount of material in the solid is
 - (a) $132 \pi \text{ cm}^3$
 - (b) $168 \pi \text{ cm}^3$
 - (c) $159 \pi \text{ cm}^3$
 - (d) Data Insufficient
36. Let S be an arbitrary point on the side PQ of an acute-angled ΔPQR . Let T be the point of intersection of QR and the straight line PT drawn parallel to SR through P. Let U be the point of intersection of PR and the straight line QU drawn parallel to SR through Q. If $PT = a$ units and $QU = b$ units, then the length of SR is
 - (a) $\frac{a+b}{ab}$ units
 - (b) $\frac{a-b}{ab}$ units
 - (c) $\frac{ab}{a+b}$ units
 - (d) $\frac{ab}{a-b}$ units

37. Find the number of ways in which a batsman can score 100 runs by scoring runs in 2's, 4's and 6's, such that he hits at least one double, one boundary and one six.
- (a) 184 (b) 185
(c) 192 (d) 208
38. Amar, Akbar and Antony are three students in a class of 9 students. A class photo is taken. The number of ways in which it can be taken such that no two of Amar, Akbar and Antony are sitting together is:
- (a) 151200 (b) 120960
(c) 181440 (d) 241920
39. The bisector of $\angle BAC$ of $\triangle ABC$ cuts BC at D and the circumcircle of the triangle at E. If $DE = 3$ cm, $AC = 4$ cm and $AD = 5$ cm, then the length of AB is
- (a) 7 cm (b) 8 cm
(c) 9 cm (d) 10 cm
40. A set 'P' is formed from the set of first 'N' natural numbers by deleting all the perfect squares and all the perfect cubes. If the numbers are arranged in an ascending order then, what is the 476th number of the set 'P'?
- (a) 500 (b) 501
(c) 502 (d) 503
41. If $7^a = 26$ and $343^b = 676$ then what is the relation between a and b?
- (a) $a = b$
(b) $a = 2b$
(c) $2a = 3b$
(d) $3a = 2b$
42. If $x(x - 3) = -1$, then the value of $x^3(x^3 - 18)$ is
- (a) 1
(b) 0
(c) -1
(d) 2
43. The percentage volumes of milk in three solutions A, B and C form a geometric progression in that order. If we mix the first, second and third solutions in the ratio 2 : 3 : 4, by volume, we obtain a solution containing 32% milk. If we mix them in the ratio 3 : 2 : 1, by volume, we obtain a solution containing 22% milk. What is the percentage of milk in A?
- (a) 6%
(b) 12%
(c) 18%
(d) 24%

Directions for questions 44 to 46: Answer the questions on the basis of the information given below.

There are ten real numbers A, B, C, D, E, F, G, H, I. Differences between any two of them are given in the diagram below.



44. If the value of A is known then how many distinct values are possible for J?
- (a) 512 (b) 256
(c) 128 (d) None of these
45. If all the 10 numbers from A to J are positive integers then at least how many of them are even?
- (a) 3 (b) 4
(c) 5 (d) 6

46. If all the 10 numbers from A to J are positive integers and A is equal to 1 then at a time at most how many of them can be perfect squares?

- (a) 7 (b) 9
(c) 8 (d) 6

47. 'P' is the product of ten consecutive two-digit natural numbers. If 2^a is one of the factors of P, then the maximum value that 'a' can assume is

- (a) 11 (b) 12
(c) 13 (d) 14

48. There are two factories – A and B – in Kaarobaarnagar. In factory A, the number of male employees is 50% more than that of female employees. In factory B, the number of female employees is 40% less than that of male employees. The number of female employees in factory B is 60 more than that of male employees in factory A. Which of the following cannot be the total number of male employees in the two factories put together?

- (a) 204
(b) 180
(c) 320
(d) 300

49. Find the domain of the function

$$f(x) = \frac{3}{9-x^2} + \log_{10}(x^3 - x).$$

- (a) $(-1, 0) \cup (1, 3)$
(b) $(-1, 0) \cup (1, 3) \cup (3, \infty)$
(c) $(-3, 0) \cup (3, \infty)$
(d) $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$

50. P1, P2, P3, ..., P11 are 11 friends. The number of balls with P1 through P11 in that order is in an Arithmetic Progression. If the sum of the number of balls with P1, P3, P5, P7, P9 and P11 is 72, what is the number of balls with P1, P6 and P11 put together?

- (a) 24
(b) 48
(c) 36
(d) Cannot be determined

Section II : VA & LR

51. Five sentences are given below, labeled A, B, C, D and E. They need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the most appropriate sequence.

- A. Two and a half years ago, her father received the grim news that he was suffering from the early symptoms of Alzheimer's.
B. She is focusing on her other career as a successful children's book author.
C. Her latest, *What's Happening to Grandpa?* is a touching, compassionate story about a young girl who learns that her grandfather is suffering from Alzheimer's disease.
D. As an author, she has taken up the challenge of tackling subjects that kids often don't understand and parents don't know how to talk about.
E. Sadly, this book - like her past two children's best-sellers *What's Heaven?* and *What's wrong with Timmy?* — stems from a firsthand family drama.

- (a) BDCEA (b) BEDCA
(c) ABEDC (d) None of the above

52. For the word given at the top of the table, match the dictionary definitions on the left with their corresponding usages on the right. Out of the four choices given in the columns below the table, select the one that has all the definitions and their usages correctly matched.

Cast

Dictionary Definition

Usage

- | | |
|----------------------------|--|
| A. Throw forcefully | E. The fisherman decided to cast his net into the sea only thrice a day. |
| B. Direct or cause to fall | F. The director cast new actors in his latest venture. |
| C. Register a vote | G. She cast a glance at him which made him crazy. |
| D. Actors in a play | H. Every responsible citizen must cast his or her vote. |

- (a) A–E, B–H, C–G, D–F
(b) A–F, B–H, C–G, D–E
(c) A–H, B–G, C–F, D–E
(d) A–E, B–G, C–H, D–F

53. Five sentences are given below, labeled A, B, C, D and E. They need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the most appropriate sequence.

- A. The knowledge worker is gaining importance since the opening up of global competition.
- B. So the bait is no longer fatter bonus, but much beyond that.
- C. Indian companies see the need to attract and retain good workers.
- D. From training sessions to spruce up their skills to fun parties — anything to keep them happy.
- E. Moreover, the employers recognize the importance of peaceful personal relationships in keeping employees happy.

- (a) ACEBD (b) CEABC
- (c) ABCDE (d) ADEBC

54. Given below are four sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are incorrect in terms of grammar and usage. Then, choose the most appropriate option.

- 1. Herbivores birds do not have teeth to grind up the vegetation they eat.
- 2. Teeth would make their skulls too heavy and make flight difficult.
- 3. Instead, a part of their digestive system, called the crop, contains stones, which grind up the plant material they eat.
- 4. Some herbivores are called ruminants.

- (a) 1 & 2 (b) 1
- (c) 2 (d) 3 & 2

55. Five sentences are given below, labeled A, B, C, D and E. They need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the most appropriate sequence.

- A. He also mentions the existential burdens on his brother with as much delicacy as the subject will permit.
- B. Many will be disappointed that there is little introspective dwelling on his relationship with Hillary.
- C. Even from the early part of his life, he seems to have inspired extraordinary loyalty from his friends, most of whom he managed to involve in his presidency.
- D. They will be disappointed because his early life in Arkansas is particularly well told.
- E. The early life contains description of his troubled family life with an abusive stepfather, the dilemmas of his mother.

- (a) ABEDC (b) BEDAC
- (c) ABCDE (d) BDEAC

56. Read the following arguments and answer the questions that follow.

A study of the effect of language on memory was performed by Loftus and Loftus, in 1975. They showed subjects a film of a traffic accident to two groups, and then asked them questions about what they had seen. After a week, the subjects were asked about the film again. One group of subjects was asked, immediately after seeing the film, "How fast were the cars going when they hit each other?" The other group of subjects was asked, "How fast were the cars going when they smashed into each other?" When they were tested later, the subjects were asked if they had seen any broken glass in the film. (There hadn't been any.) Those subjects who had heard the word "smashed" remembered seeing broken glass scattered around after the accident.

The findings of the study have significant relevance for

- (a) A move subscribing severe penalties for rash drivers who cause accidents amounting to culpable homicide.
- (b) A memory-improvement course for students who score below the national average in IQ tests.
- (c) People who are concerned about 'leading questions' in court, or in the police questioning of witnesses.
- (d) None of the above

Directions for questions 57 to 60 : Answer the questions on the basis of information given below.

A farmer has 60 hens in his poultry farm. Each of these 60 hens lays one egg per day. On each day out of the eggs laid, some of the eggs are found to be rotten and some of the eggs get broken. Only the eggs that are neither rotten nor broken are taken to the market for sale but due to some unavoidable reasons some eggs are not sold. The eggs that are not sold are brought back to the poultry farm.

Additional Information Given:

- I. Out of the eggs that are brought back on each day, 40% are rotten and 20% are broken the next morning (and they are always integers).
- II. Out of the eggs that are brought back to the poultry farm on each day, the eggs that are neither broken nor rotten are taken along with the eggs that are laid by the hens on the next day to the market for sale.
- III. On any particular day the number of eggs that are not sold is less than 20% of the number of eggs that are taken to be sold out of the eggs that are laid on each day.

- IV. Out of the eggs that are laid on each day, the number of eggs that are rotten is greater than 1 but less than 5 and the number of eggs that got broken is greater than 3 and less than 7.
- V. Every week has five days and each week starts from day 1 and ends on day 5. Assume there are no eggs with the farmer at the beginning of day 1 of the given week.
57. Find the minimum possible aggregate number of eggs sold on day 4 and day 5.
- (a) 84 (b) 83
(c) 86 (d) 85
58. If the number of eggs that got rotten and broken is maximum possible in a particular week, then find the difference between the total number of eggs that got rotten and the total number of eggs that got broken across all the five days of the week.
- (a) 4 (b) 2
(c) 6 (d) 8
59. What can be the maximum number of eggs (that are unbroken and not rotten) that were left unsold at the end of the fifth day?
- (a) 10 (b) 50
(c) 25 (d) Cannot be determined
60. If the number of eggs sold on any day of the week is maximum possible then what is the aggregate sum of the total number of eggs sold in the entire week?
- (a) 253 (b) 254
(c) 265 (d) 251
61. Read the following arguments and answer the questions that follow.

A letter from a Japanese ex-student to his American Professor:

Do you believe if I say that language can make a person different? What I mean is this. Now I can speak Japanese and English. When I was mainly speaking Japanese, I did not express myself much to other people. It can be because of the circumstances I had or the culture I have. Then I started speaking English and learnt how to express myself, and came to know who I was, what I was aiming for in the future ... Now I'm back in Japan and my mind has started thinking in Japanese. Again, I seem to stop expressing myself. If I tell you which part of mine I like better, I prefer me speaking in English even though my Japanese is far better than my English.

A possible explanation for the predicament could be:

- (a) the strong distinction of levels in Japanese society, which makes free communication very difficult.
- (b) we all lack appropriate words to express ourselves.
- (c) the Japanese ex-student did not grasp anything that he was taught within the precincts of the American classroom.
- (d) All of the above

Directions for questions 62 to 65: The passage given below is followed by a set of four questions. Choose the most appropriate answer to each question.

For as long as it has existed, fashion, being a language, has always been used as a means of communication. This very peculiar kind of communication takes place on two levels: an open one, and a hidden one. There is in fact an underlying fact, a creative value left to each individual that allows the transmission of ambiguous and equivocal messages; think of the eroticism of neglected lace, the hardness of riding boots or the provocative-ness of some metal details.

If we agree that fashion is a language we should emphasize that it is a very sophisticated one and, in a way, a complementary one — a tool for articulating and supporting words rather than substituting them. And if we agree that fashion is distinct from style, we must admit that its acknowledged codes are variable. This variation can occur at different levels mainly, but not only, visually, often revamping outdated meanings. The system of constantly shifting meanings, codes and values is in fact fundamental to fashion, as we understand it in our culture. Designers know this well and they are the first to perceive signs of instability. The instabilities, ambiguities and ambivalences, described by Fred Davis in his excellent book on the subject, drive creativity to and fro between opposites such as young/old, male/female, work/play, simplicity/complexity, revelation/concealment, freedom/constraint, conformism/rebellion, eroticism/chastity, discretion/overstatement and so on. The field where the game of change is played is framed within couples of constantly recurring antithetic meanings. Fashion delights us by playing on the tensions between these couples — we derive a frisson from the contradictions they suggest. We may tire of a look but whenever one of these themes returns, its freshness is restored; our fascination with them seems endless. James Carse, a professor of philosophy at New York University, and a friend of mine, in one of his books, divides the world of human relations into 'finite and infinite

games'. What is the difference? In the former case, the goal of the game is to select a winner; in the latter, it is to play the game forever. Incidentally, the latter is typical of the game of children, which were in fact the author's chief source of inspiration. Without doubt, fashion is an infinite game, since nobody is interested in starting the ultimate trend, the final one.

Though changes in fashion correspond to macro-changes in cultures or societies, they nevertheless require human action, the work of creative people, of industry and the complicity of consumers. Fashion, after all, does not happen by accident.

The fashion industry purposefully identifies garments and accessories as indicators of social status. Historians have suggested that this has been so since the fourteenth century. Nowadays, this identification has become a carefully planned and greatly accelerated activity. In the eternal ping-pong game between antithetical meanings, the motivating force for creativity within fashion is nearly always, or often, cultural. When Chanel urged her wealthy clients to dress like their maids, she was playing on the dialectics between the rich and the poor, the high and the low status; but the reason for her attraction to these particular themes, and the reason for the fashion's success, was her ability to intuit the predominant social tensions of the moment (in this case ideas about the uncertainties of wealth and power initiated by the economic unrest of the 1930s).

62. According to the passage, which of the following statements correctly describes one of the levels of communication through fashion?
- The open level leads to creative value which is easily understood by everyone but is shrouded by the transmission of ambiguous and equivocal messages.
 - The close level leads to creative value left for the individual which needs to be properly aligned with the open level communication.
 - The hidden level communicates creative value which can lead to transmission of ambiguous and equivocal messages.
 - All of the above
63. According to the passage, what is the relevance of the distinction between fashion and style?
- There can be significant variation in the fashion codes used by designers.
 - There is significant variation in the style codes used by designers.
 - Understanding the variability of fashion codes may make fashion more universal (which was achieved by Chanel).
 - All of the above
64. According to the passage, what is the role of contradictions, as mentioned by Fred Davis?
- Designers often avoid these contradictions in order to avoid being controversial.
 - Designers may use these well-known contradictions in order to be more creative.
 - Designers may utilize these contradictions in order to specialize in a particular genre and achieve fame and recognition.
 - Designers often collude with fashion magazines in order to resolve these contradictions.
65. What does the author wish to convey when he states that fashion is an infinite game?
- Fashion trends are numerous and cyclical.
 - No one in fashion talks about the ultimate trend.
 - Though designers believe in the ultimate trend, fashion magazines are skeptical.
 - The author calls fashion an infinite game based on its mass appeal.
- Directions for questions 66 to 69:** Answer the questions on the basis of the information given below.
- There are 6 friends — Gurvinder, Surinder, Mahinder, Bhupinder, Harinder and Joginder. Their wives are — Sita, Rama, Dolly, Monica, Trisna and Kaveri (not in the same order as their husbands). Each of these 6 friends belong to exactly one out of Ambala, Jaipur, Guntur, Kapurthala, Noida and Jammu (not necessarily in order). Each of them plays exactly one of the games — cricket, football, volleyball, snooker, TT and badminton (again not necessarily in that order). Each of the friends is married to one lady only.
- Husbands of Dolly, Trisna or Kaveri do not play football or volleyball.
 - The one who is from Guntur plays cricket.
 - Joginder plays football and is from Jammu.
 - Mahinder and Harinder are married to Sita and Monica respectively but are not from Guntur.
 - The men from Jaipur and Kapurthala are TT and volleyball players respectively.
 - Bhupinder is from Noida.
 - Rama is married to the man from Jammu.
 - Mahinder plays snooker.
66. Who is married to the man from Kapurthala?
- Dolly
 - Monica
 - Sita
 - Cannot be determined
67. The person who plays Snooker belongs to which place?
- Noida
 - Ambala
 - Jammu
 - Cannot be determined

68. Which game is being played by Bhupinder?
 (a) Badminton (b) Football
 (c) Volleyball (d) Cannot be determined
69. Who is the wife of Surinder?
 (a) Dolly (b) Trisna
 (c) Kaveri (d) Cannot be determined

Directions for questions 70 to 73: The passage given below is followed by a set of four questions. Choose the most appropriate answer to each question.

You see, society feels that it must control or discipline the citizen, shape his mind according to certain religious, social, moral and economic patterns. One of our most difficult problems is what we call discipline, and it is really very complex. Now, is discipline necessary at all? Most of us feel, especially while we are young, that there should be no discipline, that we should be allowed to do whatever we like, and we think that is freedom. But merely to say that we should or should not have discipline, that we should be free, and so on, has very little meaning without understanding the whole problem of discipline. The keen athlete is disciplining himself all the time, is he not? His joy in playing games and the very necessity to keep fit makes him go to bed early, refrain from smoking, eat the right food and generally observe the rules of good health. His discipline is not an imposition or a conflict, but a natural outcome of his enjoyment of athletics.

Now, does discipline increase or decrease human energy? Human beings throughout the world, in every religion, in every school of thought, impose discipline on the mind, which implies control, resistance, adjustment, suppression; and is all this necessary? If discipline brings about a greater output of human energy, then it is worthwhile, then it has meaning; but if it merely suppresses human energy, it is very harmful and destructive. All of us have energy, and the question is whether through discipline that energy can be made vital, rich and abundant, or whether discipline destroys whatever energy we have. I think this is the central issue. Many human beings do not have a great deal of energy, and what little energy they have is soon smothered and destroyed by the controls, threats and taboos of their particular society with its so-called education; so they become imitative, lifeless citizens of that society. And does discipline give increased energy to the individual who has a little more to begin with? Does it make his life rich and full of vitality?

When you are very young, as you all are, you are full of energy, are you not? You want to play, to rush about, to talk — you can't sit still, you are full of life. Then what happens? As you grow up, your teachers begin to curtail

that energy by shaping it, directing it into various moulds; and when at last you become men and women, the little energy you have left is soon smothered by society, which says that you must be proper citizens, you must behave in a certain way. Through so-called education and the compulsion of society, this abounding energy you have when you are young is gradually destroyed.

Now, can the energy you have at present be made more vital through discipline? If you have only a little energy, can discipline increase it? If it can, then discipline has meaning; but if discipline really destroys one's energy, then discipline must obviously be put aside.

What is this energy which we all have? This energy is thinking, feeling; it is interest, enthusiasm, greed, passion, lust, ambition, and hate. Painting pictures, inventing machines, building bridges, making roads, cultivating the fields, playing games, writing poems, singing, dancing, going to the temple, worshipping — these are all expressions of energy; and energy also creates illusion, mischief and misery. The very finest and the most destructive qualities are equally the expressions of human energy. But, you see, the process of controlling or disciplining this energy and letting it out in one direction and restricting it in another becomes merely a social convenience; the mind is shaped according to the pattern of a particular culture, and thereby its energy is gradually dissipated.

So, our problem is, can this energy, which in one degree or another we all possess, be increased, given greater vitality — and if so, to do what? What is energy for? Is it the purpose of energy to make war? Is it to invent jet planes and innumerable other machines, to pursue some guru, to pass examinations, to have children, to worry endlessly over this problem and that? Or can energy be used in a different way so that all our activities have significance in relation to something which transcends them all? Surely, if the human mind, which is capable of such astonishing energy, is not seeking reality or God, then every expression of its energy becomes a means of destruction and misery. To seek reality requires immense energy; and if man is not doing that, he dissipates his energy in ways which create mischief, and therefore society has to control him. Now, is it possible to liberate energy in seeking God or truth and, in the process of discovering what is true, to be a citizen who understands the fundamental issues of life and whom society cannot destroy? Are you following this, or is it a little bit too complex? You see, man is energy, and if man does not seek truth, this energy becomes destructive; therefore society controls and shapes the

individual, which smothers this energy. That is what has happened to the majority of grown-up people all over the world. And perhaps you have noticed another interesting and very simple fact: that the moment you really want to do something, you have the energy to do it. What happens when you are keen to play a game? You immediately have energy, do you not? And that very energy becomes the means of controlling itself, so you don't need outside discipline. In the search for reality, energy creates its own discipline. The man who is seeking reality spontaneously becomes the right kind of citizen, which is not according to the pattern of any particular society or government.

70. The athlete's example proves that
- When discipline is in-born, we enjoy it.
 - Games generate discipline naturally.
 - When one really enjoys doing something, discipline will follow as a natural outcome.
 - Athletes do not need the imposition of discipline, they are naturally disciplined.
71. As per the passage, the general effect of education is
- An organized society
 - Destruction of energy
 - Resistance and suppression
 - None of the above
72. The author believes that controlling discipline is
- Merely a social gimmick
 - Merely a social convenience at the cost of human potential
 - A necessary evil
 - Completely undesirable
73. According to the author, energy is
- Greed
 - Lust
 - Enthusiasm
 - All of the above

Directions for questions 74 to 77: The passage given below is followed by a set of four questions. Choose the most appropriate answer to each question.

Conscious of her approaching death, she has broken at last a lifetime's practice of concealment, of stashing the truth away in the manner of the papers and mementoes mouldering in her battered travel trunk. The woman in her eighties (her bones aching in the humid heat of summer, her step cautious in winter's frozen treachery) unwinds the past, sends it twisting and spiralling in an unstoppable black flow across the pages. The urgency of the project is insistent: impending foreclosure flays her on, reopening old wounds, forcing her to confront life in all its bewilderment and pain.

This, in the sparest of terms, is the framework of *The Blind Assassin*, the novel which has won for the Canadian writer, Margaret Atwood, this year's Booker Prize. Her previous near-winners were *The Handmaid's Tale*, *Cat's Eye*, and *Alias Grace*. In her latest book, Atwood explores again a theme central to her fictional universe: what happens to relationships, to human potential, to the possibility of happiness when women are kept subordinate, stultified by their inferior status and locked in silence.

Iris Chase, the woman who unravels her past across the pages of *The Blind Assassin*, is at first sight an improbable victim of history. The granddaughter of an entrepreneur who built an empire out of the manufacture of buttons and cheap clothing for the masses, she has lived, for the most part of her life, cocooned from economic hardship. In her narrative, she conjures up the whimsical splendours of Avilion, the evocatively titled domain her grandparents built in celebration of their new wealth and status and the place where she spent her childhood. Reliving her marriage to a young tycoon with political ambitions, she takes us into the sumptuous between-the-Wars world of the highly moneyed: the fur-draped fashions, the dinner parties, the Atlantic crossings on luxury liners. Such landscapes, replete with nostalgia, have in our own times yielded rich pickings to advertisers and commercial film-makers aware of the power of the past. In Atwood's case, however, evoking a class experience characterized by profligacy and privilege is not done to beguile us or set the book on course for film rights. Rather, it establishes a polarity between material advantage and emotional poverty, between the possibilities opened up by access to plenty and the reality of futile, empty lives. In a real sense, this is not only a political novel but also a morality tale.

In the book's opening pages, information is thrown at the reader from a variety of sources: from a narrative we do not yet understand to be Iris', from newspaper clippings, and from a book written by Laura Chase (Iris' sister). The last carries immediate poignancy, for we already know Laura to be dead, her car having plunged from a bridge; there is speculation that it was suicide.

This choice of structure allows Atwood to introduce, from the start, a sense of the contentious nature of experience: there is a world of difference between the clipped prose of the pro-establishment local paper and the dead Laura's unfolding of emotion (her novel is a high-intensity story of unmarried love which generated shock waves following its publication in the late 1940s). The structure also builds in elasticity, enabling the writer not only to throw the past against the present but also to change pace, to intensify and then release, in a way that tightens her hold on our sensibilities, propelling us deeper into the mystery.

There is a further dimension to this structure: through it we, the readers, find ourselves repeatedly revising the assumptions we formed at the novel's beginning. In the manner of a landscape viewed from a moving vantage point, the story shifts, rearranges itself, discloses elements once hidden from view. To specify the changes would be to give away too much of the plot, reducing the novel's capacity to surprise and challenge. What Atwood is attempting, one senses, is not a bid for authorial cleverness designed to leave the reader stunned and bemused, but rather a journey towards the truth which invites her reader to question, reformulate and reinterpret. Despite its old technology form, this is an interactive novel.

For the reader who accepts the invitation, this is a journey into pain. Atwood wields her pen like the most deadly and delicate of knives, cutting through to the raw edge of emotion, exposing our areas of greatest vulnerability: our relationships with others. Part of the stiletto sharpness of her writing derives from a use of language that is precise and alive to the sheer potency of words.

Atwood's use of analogy, too, can bring the reader up short. When Iris' father, lamed and broken, returns home in his uniform from the First World War, his medals "are like holes shot in the cloth, through which the dull gleam of his real, metal body can be seen". On board a ship at the start of her honeymoon, Iris watches professional dancers perform a passionless tango accompanied by music that is "... jagged, hobbled — like a four-legged animal lurching on three legs; a crippled bull with its head down, lunging".

This is also a book rich in tongue-in-cheek humour that at several points had me laughing out loud. In a narrative that has a strong aural quality to it, a pervasive sense of voice play, Atwood makes artful use of the character of Renee, the housekeeper at the ancestral home to whom Iris and Laura, having lost their own mother, turn for maternal attention. A working class woman with a no-nonsense outlook on life, Renee offers, through her repertoire of proverbs, sayings and catch-phrases, a running commentary on events that both entertains and unsettles. But the primary source of humour is Iris herself: curmudgeonly and difficult in old age, she is possessed of a capacity for wry observation, an ability to lay bare the incongruities of life, with humour jostling the sadness.

74. If medals "are like holes shot in the cloth", then Atwood is a critic of
- Perpetrators of war
 - Third grade tailoring
 - Glorification of war
 - All medals and awards

75. Pick the odd one out:
- A sense of the contentious nature of experience
 - An interactive novel
 - A moving vantage point
 - A capacity for wry observation
76. What does the author mean by 'the contentious nature of experience'?
- That quality of experience which makes us satisfied with our lot
 - Contextual nature of experience
 - Converging nature of experience
 - Collaborative nature of experience
77. Identify the central theme of Atwood's novel.
- Potential effects of female-subjugation
 - Presence of the past in the working of the present
 - Communality of human experience
 - None of the above

Directions for questions 78 to 81: Answer the questions on the basis of information given below.

Volleyball is a sport played by two teams on a playing court divided by a net.

The object of the game is to send the ball over the net in order to ground it on the opponent's court, and to prevent the same effort by the opponent.

The team has three hits for returning the ball.

The rally continues until the ball is grounded on the playing court, goes "out" or a team fails to return it properly. In Volleyball, the team winning a rally scores a point (Rally Point System).

There are six players on court in a volleyball team.

Matches are played in five sets. The first four sets are played to 25 points, with the final set being played to 15 points. A team must win a set by at least two points. There is no ceiling, so a set continues until one of the teams gains a two-point advantage.

A match was played between Brazil and Russia in which-

- Only three sets finished with the minimum threshold points.
- The final score of Russia was same in two of the sets in which it won one of the sets.
- In one of the sets, the final score of Brazil was less than half of Russia.
- The score of Brazil in one of the sets is same as the score of Russia in one of the other set. Both of them lost their respective sets with a different margin.
- The total score of five sets of Brazil and Russia were 108 and 116 respectively. Also, Brazil won 3 sets.

- (vi) The maximum score by any team in the five sets was 30 and the minimum was 12. Russia scored 23 points in one of the sets.
- (vii) There were only three sets in which a team won by exactly two-point advantage.
78. What was the maximum difference by which a team won the set?
- (a) 2 points (b) 12 points
(c) 13 points (d) 3 points
79. What was the score of Russia in the fifth set?
- (a) 12 points (b) 13 points
(c) 15 points (d) Cannot be determined
80. In how many sets, the score of Brazil was an even number?
- (a) 2 (b) 3
(c) 4 (d) 5
81. What was the score which was common with both the teams, and in which both won their respective sets?
- (a) 28 (b) 12
(c) 25 (d) No such score

Directions for questions 82 to 85: The passage given below is followed by a set of four questions. Choose the most appropriate answer to each question.

Attempts to explain prophecy must make suppositions about the future. The most fundamental supposition is that events in the future do not yet exist and cannot, therefore, produce effects in the present. The path of explanation that stems from this view leads necessarily to various ideas of the future as a potential that somehow exists in the present.

In their simplest form, these ideas follow the analogy of the seed and flower. A gardener can examine a seed and predict what flower it will produce. Some premonitions may indeed stem from clues scarcely noticed in a conscious way. An unfamiliar noise in a car, for example, may give rise to an accurate premonition of danger. The weakness of the theory, in this form, is that it requires of the precogniser an uncanny ability to analyze signs and indications that are not only imperceptible to the ordinary eye but also impossible to deduce theoretically. What clues in a dreamer's environment could prompt an accurate precognition of a disaster six months and 3,000 miles away? Some extraordinary suggestions have been made to explain how the future may be unrealized but cognizable in the present. One such suggestion, by Gerhard Dietrich Wasserman, a mathematical physicist at the University of Durliam in England, is that all events exist as timeless mental patterns, with which every living and non-living particle in the universe is associated.

This idea owes something to the ancient belief that the universe — the macrocosm — contains innumerable microcosms, each recapitulating the features and order of the large whole. Thus man was seen as a microcosm of the earth, his veins and arteries corresponding to streams and rivers, and so on.

By the end of the 17th century, the idea had undergone many transformations but was still potent. The great philosopher and mathematician Baron Gottfried Wilhelm von Leibniz, for example wrote, "All the different classes of being which taken together make up the universe are, in the ideas of God who knows distinctly their essential graduations, only so many ordinates of a single curve so closely united that it would be impossible to place others between any two of them, since that would imply disorder and imperfection."

Accordingly, the various orders of beings, animate and inanimate, so gradually approximate each other in their attributes and properties that they form a single chain, "so closely linked one to another that it is impossible to determine precisely the point at which one ends and the next begins." In this concept of a "chain of being" then, the animate, and therefore the spiritual or psychic, are connected with the inanimate by a gradation of shared attributes. For Leibniz the implication was that someone with enough insight "would see the future in the present as in a mirror." Another version of the idea that the future lies hidden in the present was advanced by Adrian Dobbs, a mathematician and physicist at the University of Cambridge, in 1965. As events unfold, he proposed, they actualize a relatively small number of the possibilities for change that exist at a subatomic level. In the process, disturbances are caused that create another dimension of time or what Dobbs calls a psitronic wave-front. This wave-front can be registered by the brain's neurons, at least in certain especially sensitive people, and be interpreted. A metaphor may help to clarify the process.

Imagine a pond, at one side of which a toy ship is launched; at the other side of the pond is a very small person. He is unable to see the ship, but as the ship travels forward, the waves it makes reach the shore on which he stands. As they travel across the pond, these waves pass around certain objects — weeds, leaves, a log — that are fixed or slowly drifting on its surface. The objects thus create disturbances in the wave-front, which the small person, who has a lifetime's experience in these things, is able to note in fine detail. From what he learns of the wave-fronts he not only obtains an image of the objects that produced them but also calculates how long it will be before they drift to the shore.

In this metaphor, the toy ship represents an event unfolding in time. Its course across the pond represents one of many paths it might take and the dimension of time it occurs in. The pond itself represents Dobbs's "psitronic wave-front," and the small person is, of course, the neuronal apparatus that receives the wave-front and converts it to a prediction. Granting that Dobbs's theory is purely hypothetical and that no psitronic wave has been discovered, the difficulty is in suggesting a neuronal mechanism by which the observer distinguishes the wave-front of a particular event from the presumable maelstrom of wave-fronts produced by simultaneously unfolding events. Again, the farther away the event is in the future, the more numerous the wave-fronts and the more complex the problem.

Such in general, are some of the theories that regard the future as being, in some way, a potential implicitly accessible in the present, and such are the difficulties and limitations attending them.

82. The given passage mentions each of the following EXCEPT
- Extraordinary skills of perception may be required in order to have premonitions.
 - The future does not yet exist.
 - Tremendous insight may be required in order to have premonitions.
 - Psitronic fronts are extremely elusive and stay hidden.
83. In the toy ship example, the author is least likely to agree with the statement that
- It is not possible for several events to unfold simultaneously.
 - Seemingly intangible wave-fronts can be converted to tangible predictions.
 - The toy ship could have followed different paths in the pond.
 - An analogy to Dobbs' wave-front can be drawn.
84. Which of the following is not correct as per the passage?
- Leibniz's theory did not permit the addition of new beings on the "chain of being".
 - Leibniz was convinced that animate beings share common attributes only with animate ones.
 - Animate beings, as per Leibniz, share attributes with inanimate ones also.
 - None of above
85. The word "uncanny" in the passage specifically refers to:
- The innumerable microcosms, each recapitulating the features and order of the large whole
 - The ability to analyse symptoms and indications that are not visible to the ordinary eye
 - Dobbs' version of the idea that the future lies hidden in the present
 - Premonitions that originate from hints and clues that are hardly noticed at the conscious level
86. There are two gaps in the sentence/paragraph given below. From the pairs of words given, choose the one that fills the gaps most appropriately. However, the adults in the audience may find even these _____ effects a relief, given the overwhelming _____ of most of the film.
- Gaffe, Tempo
 - Gauche, Blandness
 - Gauche, Traction
 - Gaffe, Speed
87. There are two gaps in the sentence/paragraph given below. From the pairs of words given, choose the one that fills the gaps most appropriately. Despite the _____ that has characterized much of Vietnamese history, a nationalist _____ has remained in the form of anti-colonization and anti-imperialism.
- Divisiveness, Continuity
 - Divisions, Colony
 - Schisms, Bridge
 - Tumult, Consistency
88. The word given below has been used in the given sentences in four different ways. Choose the option corresponding to the sentence in which the usage of the word is *incorrect or inappropriate*.
- Neck**
- The company that he founded in 1983 is now an albatross around his neck, making losses of several hundreds of thousands a year.
 - Your little brother who cannot sit for still for five seconds is a pain in the neck.
 - He stuck his neck out for the deal because he thought he could make some big money.
 - The two companies are neck to neck in the competition to win over customers.

89. The word given below has been used in the given sentences in four different ways. Choose the option corresponding to the sentence in which the usage of the word is *incorrect or inappropriate*.

Eyes

- (a) She cried her eyes after her husband died in a gruesome car accident.
- (b) We had a bird's eye view of the old town from the top of the city walls.
- (c) Martha married an abusive younger man with a roving eye and a habit of spending his days at the country inn.
- (d) She was a girl with stars in her eyes and dreams of becoming famous.
90. Given below are five sentences. Each sentence has a pair of words that are italicized. From the italicized words, select the most appropriate words (A or B) to form correct sentences. The sentences are followed by options that indicate the words, which may be

selected to correctly complete the set of sentences. From the options given, choose the most appropriate option.

- I. It would not be wrong to say that the politicians today are leeches (A) / leaches (B) feeding off the hard-working majority.
- II. He had been gulled (A) / culled (B) into believing that the documents were authentic
- III. The sole of the shoe should be designed in a manner such that it can take constant abrasion (A) / aberration (B).
- IV. He attenuated (A) / accentuated (B) the eccentricity of the already freakish costume by adopting theatrical attitudes and an air of satisfied negligence.
- V. She is the object of his unabashed amorphous (A) / amorous (B) intentions.
- (a) BAAAB (b) BBBAB
(c) AAABB (d) ABAAA

Directions for questions 91 to 93: Answer the questions on the basis of the information given below.

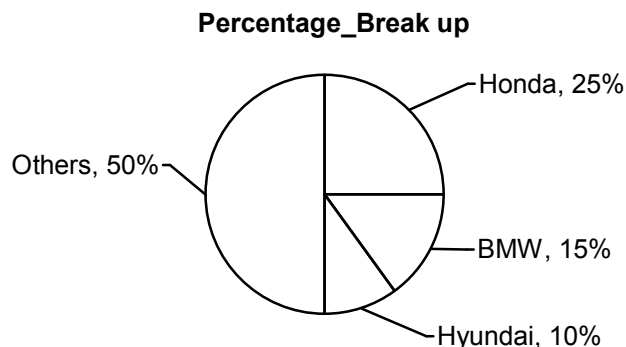
Mr. Alfonso has six cars such that each car is of a different brand. The cars with Mr. Alfonso are of the six brands Chevrolet, Ferrari, Honda, Mercedes, BMW and Hyundai. In the months of January and February in the year 2008, Mr. Alfonso drove exactly one car each day. The following table gives details about the days in January and February 2008 on which he did not drive a car of each of the given six brands. Given that January 1, 2008 was a Tuesday.

Chevrolet	Sunday	Monday	Wednesday	Friday
Ferrari	Tuesday	Thursday	Saturday	Monday
Honda	Sunday	Wednesday	Thursday	Friday
Mercedes	Tuesday	Monday	Wednesday	Thursday
BMW	Friday	Monday	Saturday	Tuesday
Hyundai	Sunday	Tuesday	Wednesday	Saturday

The number of days in January and February 2008 on which he drove a car of brand Chevrolet, Ferrari, Honda, Mercedes, BMW and Hyundai is denoted by CH, FE, HO, ME, BM and HY respectively.

It is also known that $HO > ME > CH > BM > HY > FE$.

The following pie – chart gives details about the number of days in January and February 2008 on which he drove a car of brand Honda, BMW and Hyundai.



91. Given that the number of days in January 2008 on which Mr. Alfonso drove the car of brand Honda is the maximum. What is the number of days in February 2008 on which he drove the car of brand Honda?
- (a) Zero (b) One
(c) Three (d) Two
92. If Mr. Alfonso drove the car of brand Chevrolet on all possible Saturdays in January 2008 and all possible Thursdays in January 2008 and February 2008, then what is the number of days on which he drove Ferrari in the given two months?
- (a) Four (b) Two
(c) Three (d) Five
93. What is the difference between the maximum and minimum possible number of days on which Mr. Alfonso drove the car of brand Mercedes in the given two months?
- (a) Four (b) Three
(c) Two (d) One
94. Given below are five sentences. Each sentence has a pair of words that are italicized. From the italicized words, select the most appropriate words (A or B) to form correct sentences. The sentences are followed by options that indicate the words, which may be selected to correctly complete the set of sentences. From the options given, choose the most appropriate option.
- The animal approached us *bellowing* (A) / *billowing* (B) and pawing the ground with the strength of many earthly bulls.
 - I have seen this whole body of soldiers, upon a word of command, draw their swords at once, and brandish (A) / blandish (B) them in the air.
 - I am surprised that plaintiffs' hyperbolic allegations and inflated damage claims are given any credence (A) / cadence (B).
 - A number of the species are edible, while others have been recorded as deleterious (A) / delirious (B).
 - From the top of the hill I decried (A) / descried (B) a solitary rider.
- (a) BABAB (b) BBBAB
(c) ABAAB (d) AAAAB
95. Given below are five sentences. Each sentence has a pair of words that are italicized. From the italicized words, select the most appropriate words (A or B) to form correct sentences. The sentences are followed by options that indicate the words, which may be selected to correctly complete the set of sentences. From the options given, choose the most appropriate option.
- A survey of the history of Christianity tells a disturbing tale, one wherein diffident (A) / dissident (B) cries for reform resulted in dangerous accusation of heresy and witchcraft.
 - Certainly the Arabs have no interest in seeing another war conflagrate (A) / conflate (B) in the Gulf region.
 - The government operates according to its own rules, bringing enormous benefits to the chosen few, and suffering and immiseration (A) / commiseration (B) to millions.
 - If the minority in such case cedes (A) / secedes (B) rather than acquiesces, it will make a precedent which in turn will divide and ruin them.
 - The full moon beams like a beckon (A) / beacon (B) in the clear sky.
- (a) BBAAB (b) BAABB
(c) ABBBA (d) AAABB
96. Four sentences are given below, labeled (a), (b), (c) and (d). Of these, three sentences need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the one that does not fit the sequence.
- With footage including wallowing hippos, galloping herds of antelope and lurching hyenas, it really shows the potential of drones in wildlife filmmaking.
 - So whether it's an aerial shot of surfers riding giant waves off the coast of Oahu, Hawaii or an eerie journey through ice caves in Alaska, we've rounded up six of the best videos filmed by drones around the world.
 - By using a drone, he gives you a rare look at the shape of the waves coming in, the flow of the surfers around the bay and the motion of the barrels as they break.
 - A state-of-the-art video being the one created by photographer Will Burrard-Lucas using his "BeetleCopter" - this stunning film takes a drone on a safari in the Serengeti.
97. Four sentences are given below, labeled (a), (b), (c) and (d). Of these, three sentences need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the one that does not fit the sequence.
- If that's what it is, there's little wonder Britain is no longer capable of marching into somebody else's country and forcing the indigenous population to wear ill-fitting suits and make us all a fried breakfast.
 - I should think that when the English Spirit of Cricket waddles self-deprecatingly into view looking down at the ground, the Australian Spirit of Cricket spits, readjusts its box and growls, "Strewth, what happened to you mate? Did you blow all the housekeeping money at the pie stall?"

EXPLANATIONS

1. Let the lengths of the sides of the rectangle be a units and b units.

By the problem,

$$\begin{aligned} ab &= 2a + 2b \\ a &= 2b / (b - 2) \end{aligned}$$

Two cases are possible-

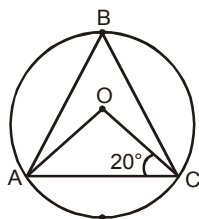
- (i) $a = 4, b = 4$
- (ii) $a = 3$ and $b = 6$

Thus, two different rectangles are possible.

2. There would be 2 cases.

Case I: When B lies in greater arc AC.

The figure would be as below.



$$\angle OAC = \angle OCA = 20^\circ$$

\Rightarrow

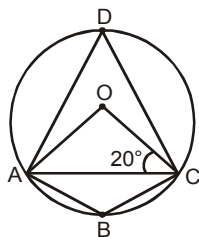
$$\angle AOC = 140^\circ$$

\therefore

$$\angle ABC = \frac{1}{2} \angle AOC = 70^\circ$$

Case II: When B lies in smaller arc AC.

The figure would be as given below.



Let D be a point O is the greater arc AC.

$$\angle OAC = \angle OCA = 20^\circ$$

\Rightarrow

$$\angle AOC = 140^\circ$$

\therefore

$$\angle ADC = \angle AOC = 70^\circ$$

ABCD is a cyclic quadrilateral

\therefore

$$\angle ABC = 180^\circ - 70^\circ = 110^\circ.$$

3. Say you have an equation,

$$(x - 1)(x - 2)(x - 3) = 0$$

$$\Rightarrow (x^2 - 3x + 2)(x - 3) = 0$$

$$\Rightarrow x^3 - 6x^2 + 11x - 6 = 0$$

By the question, $x = 3, a_n = -6, a_1 = -6$.

Substitute the above values in the option.

Option (a): $(-6)^3 \geq 3^3 \times -6$

$$\Rightarrow -216 \geq -168$$

This is incorrect, thus option (a) is incorrect.

Option (b): $3^3 \geq (-6)^3 \times -6$
 $27 \geq 6^4$

This is incorrect, thus option (b) is incorrect.

Option (c): $(-6)^3 \geq 3^3 \times -6$

$$\Rightarrow -216 \geq -168$$

This is incorrect, thus option (c) is incorrect.

Thus, none of the options is necessarily true.

4. $X = (\log_{10} 1 + \log_{10} 2 + \dots + \log_{10} n)$
 $- (\log_{10} 1 + \log_{10} 2 + \dots + \log_{10} p)$
 $- (\log_{10} 1 + \log_{10} 2 + \dots + \log_{10}(n - p))$
 $\Rightarrow X = \log_{10} n! - \log_{10} p! - \log_{10} (n - p)!$
 $\Rightarrow X = \log_{10} \frac{n!}{p!(n-p)!}$

X is maximum when $\frac{n!}{p!(n-p)!}$ is maximum.

$$\Rightarrow \frac{8!}{p!(8-p)!} \text{ is maximum, i.e. } {}^8C_p \text{ is maximum}$$

$$\Rightarrow p = 4$$

$$\Rightarrow X = \log_{10} \frac{8!}{4!(8-4)!} = \log_{10} 70 = 1 + \log_{10} 7.$$

5. Replace y by $-y$.

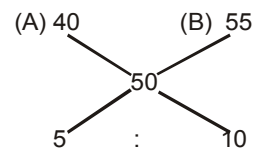
The equation becomes

$$\sqrt{3}x - y = \sqrt{3}.$$

\Rightarrow

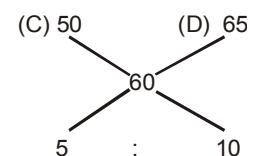
$$y = \sqrt{3}x - \sqrt{3}.$$

6. Using allegation,



$$\Rightarrow 1 : 2$$

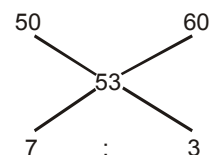
Hence $a : b = 1 : 2$



$$\Rightarrow 1 : 2$$

Hence, $c : d = 1 : 2$

Also,



Hence, $x : y = 7 : 3$

To have minimum x (= 7 kg) and y (= 3 kg)

we need $(a + b) \geq 7$ and $(c + d) \geq 3$.

Hence, minimum $a + b = 9$ (as it has to be in the ratio of 1 : 2 it must be a multiple of 3)

Minimum $c + d = 3$.

Minimum $a + b + c + d + x + y$
 $= 9 + 3 + 7 + 3 = 22$ kg.

$$\begin{aligned} 7. \quad f(2n) &= 1^4 + 2^4 + 3^4 + 4^4 + 5^4 + \dots + (2n)^4 \\ \Rightarrow f(2n) &= (1^4 + 3^4 + 5^4 + \dots + (2n-1)^4) + (2^4 + 4^4 \\ &\quad + 6^4 + \dots + (2n)^4) \end{aligned}$$

$$\begin{aligned} \therefore 1^4 + 3^4 + 5^4 + \dots + (2n-1)^4 &= f(2n) - (2^4 + 4^4 + 6^4 + \dots + (2n)^4) \\ &= f(2n) - 2^4 \times (1^4 + 2^4 + 3^4 + \dots + n^4) \\ &= f(2n) - 16 \times f(n). \end{aligned}$$

8. Minimum percentage to pass in a subject = 33.33%

Thus, 40° out of 360° represents 33.33%.

$\Rightarrow 60^\circ$ represents 50%.

9. Let maximum marks for each subject other than maths

$$= 100$$

\therefore Maximum marks in maths = 200.

For Geoffrey, $144^\circ = 200$ marks.

$\Rightarrow 360^\circ = 500$ marks.

For Tommen, if $120^\circ = 200$ marks then

$72^\circ > 100$ marks,

which is not possible.

\therefore For Tommen, $72^\circ = 100$ marks

$\Rightarrow 360^\circ = 500$ marks.

\therefore Ratio of maximum marks, in all the subjects put together, which Geoffrey can score to the maximum marks, in all the subjects put together, which Tommen can score = 1 : 1.

10. Before the change in pattern,

$$144^\circ = 100 \text{ marks}$$

$\Rightarrow 360^\circ = 250$ marks.

After the change in pattern,

$$80^\circ = 100 \text{ marks}$$

$\Rightarrow 360^\circ = 450$ marks.

\therefore Desired ratio = 450 : 250 = 9 : 5.

11. By the problem,

$$144^\circ = 100 \text{ marks}$$

$\Rightarrow 360^\circ = 250$ marks.

$$\begin{aligned} \therefore \text{Average percentage} &= \frac{250}{500} \times 100 \\ &= 50\%. \end{aligned}$$

12. If there are 60 chairs around a circular table, consider a scenario wherein there are two chairs vacant between every two consecutive people. Thus, there will be exactly 20 people sitting and exactly 40 vacant seats between them and in such a scenario, next person coming to sit will have to sit next to someone.

13. When common difference is 1, the first term can be anything from 1 to 46 i.e. 46 values.

When common difference is 2, the first term can be anything from 1 to 42 i.e. 42 values.

Similarly, when common difference is 12, the first term can be anything from 1 to 2 i.e. 2 values.

\therefore Total possible AP's = 46 + 42 + ... + 2

$$= 12 \left(\frac{2+46}{2} \right) = 288.$$

14. $p + q = 1$, i.e. $q = 1 - p$ ($0 = p, q = 1$)

Now when the sum of two variables is a constant then their multiplication is the maximum when they

are equal. So, pq will be maximum and $\left(\frac{1}{p}\right)\left(\frac{1}{q}\right)$ the

minimum when $p = q = \frac{1}{2}$.

Thus, the minimum value of $X = 0.25 + 4 = 4.25$.

15. Let the earlier cost price of the item = ₹ 100

\Rightarrow Earlier marked price = ₹ 105.

On that day, 30% discount is offered on

$$₹ 3 \times 105 = ₹ 315$$

Thus, new selling price = ₹ 220.50

\Rightarrow New Profit percentage = 120.50%.

16. There would be two cases.

They are as follows:

Case I: $x \geq 0$... (i)

The inequality becomes,

$$\frac{1}{x-2} < 0.5$$

$$\Rightarrow (x-2) < 0.5(x-2)^2$$

$$\Rightarrow (x-2)^2 - 2(x-2) > 0$$

$$\Rightarrow (x-2)(x-4) > 0$$

$$\Rightarrow x > 4 \text{ or } x < 2$$

Using (i), the range becomes

$$x > 4 \text{ or } 0 \leq x < 2 \quad \dots \text{(ii)}$$

Case II: $x < 0$... (iii)

The inequality becomes,

$$\frac{1}{-x-2} < 0.5$$

$$\Rightarrow \frac{1}{x+2} > -0.5$$

$$\Rightarrow 2(x + 2) + (x + 2)^2 > 0$$

$$\Rightarrow (x + 2)(x + 4) > 0$$

$$\Rightarrow x > -2 \text{ or } x < -4$$

Using (iii), the range becomes

$$-2 < x < 0 \text{ or } x < -4 \quad \dots \text{(iv)}$$

Combining (ii) and (iv),

The range is $(x < -4) \cup (-2 < x < 2) \cup (x > 4)$.

17. We obtain the sum of all the coefficients of a polynomial by equating all the variables to 1. Here by putting $x = 1$ in the polynomial, the required sum comes out to be zero.

18. Let the numbers be a and b .

We know, $a + b = 600$ and $\frac{a}{b} = \frac{7}{8}$

Solving, the above two equations, we get

$$a = 280$$

$$b = 320$$

$$\begin{aligned} \text{LCM}(a, b) &= \text{LCM}(280, 320) \\ &= 2240. \end{aligned}$$

19. Profitability of NIIT in 1999 is $\frac{106}{481} = 0.2204$

Profitability of Aptech in 1999 is $\frac{51}{320} = 0.1594$

Profitability of SSI in 1999 is $\frac{34}{85} = 0.4$

Profitability of Tata Infotech in 1999 is $\frac{6}{420} = 0.0143$

Average of the profitabilities of the four companies in 1999

$$= \frac{\frac{106}{481} + \frac{51}{320} + \frac{34}{85} + \frac{6}{420}}{4} = 0.1985.$$

\therefore Only Tata Infotech and Aptech have a profitability less than the average of the profitabilities in 1999.

20. Total revenues of four companies in 2001

$$= 509 + 285 + 231 + 523$$

$$= 1548 \text{ crore.}$$

Total profit in 2001 = $20 + 54 + 51 + 27$

$$= 152 \text{ crore}$$

So total cost = $(1548 - 152) = 1396$ crore

In 2002, total revenue $\approx (1548 - 155)$ crore

$$= 1393 \text{ crore.}$$

Total cost $\approx (1396 + 140) = 1536$ crore

Hence, net profit = $(1393 - 1536)$

$$= -143 \text{ crore}$$

\therefore Profitability = $\frac{-143}{1393} = -10.25\%$.

21. The profitability of NIIT, Aptech, SSI and Tata Infotech in 2001 is $\frac{20}{509}, \frac{54}{285}, \frac{51}{231}$ and $\frac{27}{523}$ respectively.

Thus, the correct order is:

NIIT, Tata Infotech, Aptech and SSI.

22. The profitability SSI is highest in 2000 and it is $= \frac{49}{131}$.

23. Let the length of the other two sides of the triangle be 'a' and 'b' respectively,

$$\Rightarrow a^2 + b^2 = 240^2 = 57600$$

Also, $a + b + 240$ must be a perfect square.

Perimeter of a right angled triangle is maximized when the two sides other than its hypotenuse are equal in length.

Therefore, the maximum perimeter of the right angled triangle will be

$$120(\sqrt{2}) + 120(\sqrt{2}) + 240 = 579(\text{approx}).$$

Also, the perimeter of the triangle should be greater than twice of the length of the hypotenuse of the triangle.

Therefore, the perimeter of the triangle should be greater than 480 and less than 579.

Possible squares in the above range are 484, 529 and 576.

But, as per the information given in the question, the perimeter can only be equal to 576.

The values of 'a' and 'b' will be 192 and 144 units not necessarily in that particular order.

Hence, option (d) is the correct choice.

24. The equations formed by the roots of the equation $(x - a)(x - b)(x - c)$ can be as follows:

(i) $(x - a)(x - b) \Rightarrow$ Roots are a, b

(ii) $(x - b)(x - c) \Rightarrow$ Roots are b, c

(iii) $(x - c)(x - a) \Rightarrow$ Roots are c, a

(iv) $(x - a)^2 \Rightarrow$ Roots are a, a

(v) $(x - b)^2 \Rightarrow$ Roots are b, b

(vi) $(x - c)^2 \Rightarrow$ Roots are c, c

Adding all these roots, we get $4(a + b + c)$.

25. Let us assume $f(0) = K$, where 'K' is a constant.

Then, $f(0 + y) = f(0.y) = f(0) = K$

and $f(x + 0) = f(x.0) = f(0) = K$.

This proves that the function is a constant function.

Thus, the value of

$$f(-49) = f(49) = 7$$

Hence, $f(-49) + f(49) = 14$.

26. Option (a): This statement is always true.
 Option (b): This statement is necessarily false as the smallest possible integral length of EF is 4 units.
 Option (c): This statement is true when EF is parallel to BC.
 Option (d): This statement is always true.
27. By the question,

$$\log_3(2^x - 5) - \log_3 2 = \log_3\left(2^x - \frac{7}{2}\right) - \log_3(2^x - 5)$$

$$\Rightarrow \log_3\left(\frac{2^x - 5}{2}\right) = \log_3\left(\frac{2^x - \frac{7}{2}}{2^x - 5}\right)$$

$$\Rightarrow \frac{2^x - 5}{2} = \frac{2^x - \frac{7}{2}}{2^x - 5}$$

Let $2^x = a$

$$\Rightarrow \frac{a - 5}{2} = \frac{a - \frac{7}{2}}{a - 5}$$

$$\Rightarrow a^2 - 10a + 25 = 2a - 7$$

$$\Rightarrow a^2 - 12a + 32 = 0$$

$$\Rightarrow (a - 4)(a - 8) = 0$$

$$\Rightarrow a = 4 \text{ or } 8$$

$$\therefore x = 2 \text{ or } 3.$$

Hence, $2^x - 5 = -1$,

when $x = 2$, which is not possible.

$$\therefore x = 3.$$

28. Let the container (without the handle) weigh $100x$ when it is completely filled with a liquid.
 \therefore The empty metal container (without its handle) weighs $15x$.

After handle is added weight of fully filled container
 $= 105x$.

\therefore Weight of handle $= 5x$.

\therefore Weight of partly filled container

$$= \frac{1}{3} \times 105x = 35x.$$

\therefore Weight of liquid in partly filled container

$$= 35x - (15x + 5x) = 15x.$$

Total capacity of container

$$= 105x - (15x + 5x) = 85x.$$

\therefore Fraction of container that is utilized

$$= \frac{15x}{85x} = \frac{3}{17}.$$

29. nth term of the series can be written as

$$\begin{aligned} \frac{1}{n! + (n+1)!} &= \frac{1}{n!(n+2)} \\ &= \frac{(n+1)}{(n+2)!} \\ &= \frac{1}{(n+1)!} - \frac{1}{(n+2)!}. \end{aligned}$$

Put $n = 1, 2, \dots, 10$ to get

$$\begin{aligned} \left(\frac{1}{2!} - \frac{1}{3!}\right) + \left(\frac{1}{3!} - \frac{1}{4!}\right) + \dots + \left(\frac{1}{10!} - \frac{1}{11!}\right) \\ = \frac{1}{2!} - \frac{1}{11!}. \end{aligned}$$

30. The distance covered by R in 2 hours (3 PM to 5 PM) is same as the distance covered by P in 4 hours (1 PM to 5 PM).

Ratio of speeds of P and R $= 1 : 2$.

Now, R takes over Q in another hour by doubling his speed, so R has covered a total distance in 3 hours (3 PM to 6 PM) which he would have covered in 4 hours without changing his speed.

To cover the same distance, a takes 5 hours (1 PM to 6 PM) Ratio of speed of Q and R $= 4 : 5$

\Rightarrow Ratio of speed of P and Q $= 5 : 8$.

For questions 31 to 33: The following table can be drawn.

B-school	No. of companies	No. of students	No. of offers	Offers per company	Offers per student
FMS	60	100	125	2.08	1.25
IMT	90	150	225	2.5	1.5
IMI	50	120	150	3	1.25
K.J.Somai	70	150	150	2.14	1
Narsee Monjee	80	150	200	2.5	1.33

31. IMT has the highest number of offers per student.

32. IMI has the highest ratio of offers per company.

33. Total salary for FMS $= 100 \times 7$
 $= ₹ 700$ lakh.

Total salary of PPO holders $= (25\% \text{ of } 100) \times 10$
 $= ₹ 250$ lakh.

\therefore Average annual salary of people not getting PPOs

$$\begin{aligned} &= \frac{700 - 250}{75} \\ &= 6 \text{ lakhs.} \end{aligned}$$

34. Put $n = 5$, in the given relation to get $P_5 = 267$.

$$P_6 = P_5 - P_4 + P_3 - P_2$$

$$\Rightarrow P_6 = -P_1$$

$$P_7 = -P_2$$

Similarly,

$$P_8 = -P_3$$

$$P_9 = -P_4$$

$$P_{10} = -P_5$$

The sequence repeats its terms after every 10 terms.

Following this pattern, we observe that

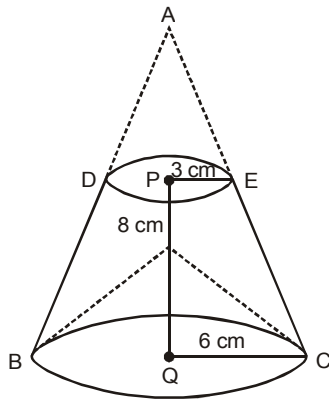
$$P_{531} = P_{(530+1)} = P_1 = 211$$

$$P_{753} = P_{(750+3)} = P_3 = 420$$

$$P_{975} = P_{(970+5)} = P_5 = 267$$

So; $P_{531} + P_{753} + P_{975} = 211 + 420 + 267 = 898$.

35.



In the figure given above, ABC represents the actual cone from which the frustum was made. DEBC represents the frustum and BRC represents the conical cavity.

Now, the volume of the material in the solid can be calculated by subtracting the volume of the cone ADE and the conical cavity BRC from the cone ABC.

ΔAPE and ΔAQC are similar,

$$\Rightarrow \frac{AP}{AQ} = \frac{PE}{QC}$$

$$\Rightarrow AP = 8 \text{ cm.}$$

$$\text{Volume of cone ABC} = \frac{1}{3}\pi(6)^2 \times 16$$

$$\text{Volume of cone APE} = \frac{1}{3}\pi(3)^2 \times 8$$

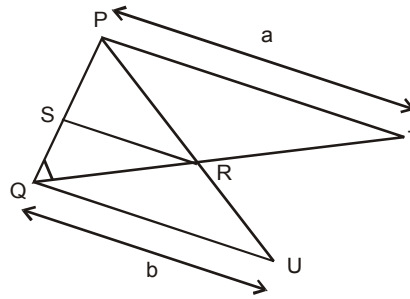
$$\text{Volume of conical cavity BRC} = \frac{1}{3}\pi(6)^2 \times 3$$

Required volume of solid

$$= \frac{1}{3}\pi(6)^2 \times 16 - \frac{1}{3}\pi(3)^2 \times 8 - \frac{1}{3}\pi(6)^2 \times 3$$

$$= 132\pi \text{ cm}^3.$$

36.



Given that $PT \parallel SR \parallel QU$

$PT = a$ units, $QU = b$ units.

ΔPQT and ΔSRQ are similar.

\therefore We have

$$\frac{PQ}{PT} = \frac{SQ}{SR}$$

or $\frac{PQ}{a} = \frac{SQ}{SR}$... (i)

ΔUQP and ΔRSP are similar.

\therefore We have $\frac{PQ}{QU} = \frac{PS}{SR}$

or $\frac{PQ}{b} = \frac{PS}{SR}$... (ii)

Combining (i) and (ii)

$$\frac{PQ}{a} + \frac{PQ}{b} = \frac{SQ+PS}{SR}$$

or $PQ\left(\frac{1}{a} + \frac{1}{b}\right) = \frac{PQ}{SR}$ [As $SQ + PS = PQ$]

$$PQ\left[\frac{a+b}{ab}\right] = \frac{PQ}{SR}$$

or $SR = \frac{ab}{a+b}$.

37. Let the batsman scored a 2's, b 4's and c 6's.

$$\Rightarrow 2a + 4b + 6c = 100$$

$$\Rightarrow a + 2b + 3c = 50. \quad \dots (i)$$

When $c = 1$, (i) becomes $a + 2b = 47$

$$\Rightarrow a = 47 - 2b \quad \dots (ii)$$

Since $a \geq 1$ and $b \geq 1$, the number of solutions of (ii) is 23.

When $c = 2$, (i) becomes $a + 2b = 44$

$$\Rightarrow a = 44 - 2b \quad \dots (iii)$$

Since $a \geq 1$ and $b \geq 1$, the number of solutions of (iii) is 21.

When $c = 3$, (i) becomes $a + 2b = 41$

$$\Rightarrow a = 41 - 2b \quad \dots (iv)$$

Since $a \geq 1$ and $b \geq 1$, the number of solutions of (iv) is 20.

When $c = 4$, (i) becomes $a + 2b = 38$

$$\Rightarrow a = 38 - 2b \quad \dots (v)$$

Since $a \geq 1$ and $b \geq 1$, the number of solutions of (v) is 18.

Thus, we see a pattern emerging.

$$\begin{aligned} \therefore \text{The total number of ways} &= 23 + 21 + 20 + 18 + \dots + 3 + 2 \\ &= 184. \end{aligned}$$

38. First let the 6 other students be seated in 6 chairs.

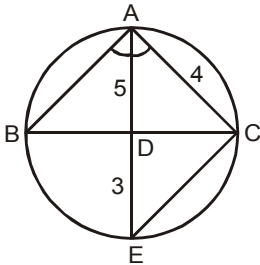
The number of spaces between the 6 students = 7.

\therefore Amar, Akbar and Anthony can be seated in the 7 places in 7C_3 ways.

Thus, the number of ways in the class photo can be taken such that no two of Amar, Akbar and Anthony are sitting together is

$$\begin{aligned} &= {}^7C_3 \times 3! \times 6! \\ &= 151200. \end{aligned}$$

39.



The figure would be as shown above.

Join EC.

Let $\angle BAD = x^\circ$

and $\angle ABD = y^\circ$.

$\Rightarrow \angle DAC = x^\circ$

and $\angle AEC = y^\circ$.

In $\triangle ABD$ and $\triangle AEC$,

$$\angle ABD = \angle AEC$$

$$\angle BAD = \angle EAC$$

$$\therefore \triangle ABD \sim \triangle AEC$$

$$\Rightarrow \frac{AB}{AD} = \frac{AE}{AC}$$

$$\Rightarrow AB = \frac{AE}{AC} \times AD$$

$$= \frac{8}{4} \times 5$$

$$= 10 \text{ cm.}$$

40. If we take the 1st option, and delete all perfect squares and perfect cubes, a total of 22 perfect square will be deleted ($1^2, 2^2, \dots, 22^2$) and a total of 7 perfect cubes will be deleted ($1^3, 2^3, \dots, 7^3$).

Two numbers are common in between them viz. 1^6 and 2^6 which are perfect squares as well as perfect cubes.

Thus, 500 is the $(500 - 22 - 7 + 2) = 473$ rd term.

Hence, the 476th term will be $500 + 3 = 503$.

$$41. \quad 343^b = 676$$

$$\Rightarrow 7^{3b} = 26^2$$

$$\text{Now, } 7^a = 26$$

$$\Rightarrow 7^{3b} = (7^a)^2$$

$$\Rightarrow 2a = 3b.$$

42. By the question,

$$x(x - 3) = -1$$

$$\Rightarrow x^3(x - 3)^3 = -1$$

$$\Rightarrow x^3(x^3 - 27 - 9x^2 + 27x) = -1$$

$$\Rightarrow x^3(x^3 - 18) + x^3(-9 - 9x^2 + 27x) = -1$$

$$\Rightarrow x^3(x^3 - 18) - 9x^3(x^2 - 3x + 1) = -1$$

$$\Rightarrow x^3(x^3 - 18) - 9x^3(-1 + 1) = -1$$

$$\Rightarrow x^3(x^3 - 18) = -1.$$

43. Suppose percentage of milk in A, B and C vessels is a , ar and ar^2 respectively.

By the problem,

$$\frac{2a + 3ar + 4ar^2}{900} = \frac{32}{100} \quad \dots (i)$$

$$\frac{3a + 2ar + ar^2}{600} = \frac{22}{100} \quad \dots (ii)$$

From (i) & (ii), $a = 12$ and $r = 2$.

\therefore The percentage of milk in A = 12%.

For questions 44 to 46:

The table below gives all the possible values of B, C, D, E, F, G, H, I and J if the value of A is assumed to be 'x'.

A	x
B	$x \pm 1$
C	$x \pm 1; x \pm 3$
D	$x; x \pm 2; x \pm 4; x \pm 6$
E	$x \pm 1; x \pm 3; x \pm 5; x \pm 7$
F	$x \pm 1; x \pm 3; x \pm 5; x \pm 7; x \pm 9$
G	$x; x \pm 2; x \pm 4; x \pm 6; x \pm 8; x \pm 10; x \pm 12$
H	$x \pm 1; x \pm 3; x \pm 5; x \pm 7; x \pm 9; x \pm 11; x \pm 13$
I	$x \pm 1; x \pm 3; x \pm 5; x \pm 7; x \pm 9; x \pm 11; x \pm 13; x \pm 15$
J	$x; x \pm 2; x \pm 4; x \pm 6; x \pm 8; x \pm 10; x \pm 12; x \pm 14; x \pm 16; x \pm 18$

44. Clearly only 19 distinct values are possible for J if the value of A is known.

Answer option (d) is the correct choice.

45. If 'x' is even then A, D, G and J are even. If 'x' is odd then B, C, E, F, H and I are even.

Answer option (b) is the correct choice.

46. If $x = 1$ then a possibility is that $B = 2, C = 4, D = 1, E = 2, F = 4, G = 1, H = 2, I = 4$ and $J = 1$ in which case 7 values are perfect squares. This is the maximum number of perfect squares which can occur at the same time i.e. in a single case.

47. In order to maximize the power of 2 in the product, one of the ten numbers has to be 64 as this is the highest two-digit number of the form 2^k , where k is a natural number.

There has to be maximum number of multiples of 8 among the ten numbers. In a set of ten consecutive natural numbers, there can be a maximum of two numbers that will be a multiple of 8.

The possible sets of ten consecutive natural numbers that satisfy the aforementioned conditions are 55 to 64, 56 to 65, 63 to 72 and 64 to 73. The highest power of 2 in the product of any of these sets of ten numbers will be 13.

48. Let the number of female employees in factory A and the number of male employees in factory B be $2a$ and $5b$ respectively. Therefore, the number of male employees in factory A and that of female employees in factory B will be $3a$ and $3b$ respectively.

$$\begin{aligned} \therefore \quad & 3b = 3a + 60 \\ \Rightarrow \quad & b - a = 20 \quad \dots(i) \end{aligned}$$

Total number of male employees in the two factories put together

$$\begin{aligned} &= 3a + 5b. \\ &= 3a + 5 \times (20 + a) \\ &= 8a + 100. \end{aligned}$$

Among the given options, only $8a + 100 = 320$ will not give a positive integer value of 'a'.

$$\begin{aligned} 49. \quad & f(x) = \frac{3}{9-x^2} + \log_{10}(x^3 - x) \\ & 9 - x^2 \neq 0 \\ \Rightarrow \quad & x^2 \neq 9 \\ \Rightarrow \quad & x \neq 3, -3 \quad \dots (i) \\ & x^3 - x > 0 \end{aligned}$$

$$\begin{aligned} \Rightarrow \quad & (x - 1)x(x + 1) > 0 \\ \Rightarrow \quad & x > 1 \\ \text{or} \quad & -1 < x < 0 \quad \dots (ii) \end{aligned}$$

Combining (i) and (ii)

$$x \in (-1, 0) \cup (1, 3) \cup (3, \infty).$$

50. Let the number of balls with

$$\begin{aligned} P_i &= a_i \quad (i = 1 \text{ to } 11) \\ a_1 + a_3 + a_5 \dots + a_{11} &= 6(a_6) \\ &= 72. \end{aligned}$$

As a_6 would be the arithmetic mean of these 11 numbers and

$$\begin{aligned} 2(a_6) &= (a_1 + a_{11}) \\ &= (a_2 + a_{10}) \\ &= (a_3 + a_9) \\ &= (a_4 + a_8) \\ &= (a_5 + a_7) \\ \therefore \quad a_1 + a_6 + a_{11} &= 3(a_6) \\ &= 36. \end{aligned}$$

51. Sentence B talks about the other career of a person; sentence D talks about what direction that has taken and sentence C mentions her latest book. Sentence E talks about how it has been inspired by an instance in her life and sentence A goes on to describe that instance. This makes option (a) the correct answer.

52. This question can be solved simply by working out the options for C. You can easily arrive at CH, which will give you option (d) as the answer

53. AC is a mandatory pair as both these sentences discuss the importance of knowledge workers in the face of global competition. E, B and D are connected to each other as they discuss means of keeping workers happy. Thus, option (a) is the correct answer.

54. Herbivorous birds would be correct; herbivorous is an adjective, herbivores is a noun. The other sentences are correct. Thus, option (b) is the correct answer.

55. BD is a mandatory pair. Sentence B mentions that many would be disappointed. Sentence D mentions the reason for this disappointment; sentence E then goes on to mention aspects of his early life and sentence A further adds to this. Sentence C ends the sequence with a comment about his relationship with his friends. This makes option (d) the correct answer.

56. Options (a) and (b) are irrelevant. Loftus and Loftus found that the way in which questions were asked had a significant impact on what the subjects recalled. The implication of this is that when someone is asked to recall something, the phrasing/wording of the question may distort their recollections. Hence, option (c) is the correct answer.

For questions 57 to 60:

Number of eggs laid on each day

$$= \text{Number of hens in the poultry farm} \\ = 60.$$

Out of the eggs laid on each day, the number of eggs that got rotten is either 2 or 3 or 4.

Out of the eggs laid on each day, the number of eggs that got broken is either 4 or 5 or 6.

Maximum possible number of eggs taken to the market for sale on day 1

$$= 60 - (2 + 4) \\ = 54.$$

Minimum possible number of eggs taken to the market for sale on day 1

$$= 60 - (4 + 6) \\ = 50.$$

The minimum number of eggs that are left unsold each day must be 5, as the number of eggs that are rotten and broken among them needs to be an integer. It can be at max 10, since number of egg left unsold on any day is less than 20% of the number of eggs laid on each day, i.e. 20% of 60 = 12.

So, the number of eggs that are sold on day 1 ranges from (50 - 10 = 40) to (54 - 5 = 49), (both inclusive).

On the next day again 60 eggs are laid, so from the above logic the range of number of eggs sold should again come out to be from 42 to 49 (both inclusive), but there are eggs that remain unsold at the end of the previous day.

Minimum possible number of eggs that are left over from the previous day and are taken along with the eggs laid on a day to the market for sale

$$= 5 - (40\% \text{ of } 5) - (2\% \text{ of } 5) = 2.$$

Maximum possible number of eggs that are left over from the previous day and are taken along with the eggs laid on a day to the market for sale

$$= 10 - (40\% \text{ of } 10) - (20\% \text{ of } 10) = 4.$$

So, the range of number of eggs that are sold on day 2 varies from (40 + 2 = 42) to (49 + 4 = 53) (both inclusive) and this holds true for day 3, day 4 and day 5 also.

	Eggs Laid	Rotten	Broken	Sold	Unsold
Day 1	60	2 - 4	4 - 6	40 - 49	5 or 10
Day 2	60	2 - 4	4 - 6	42 - 53	5 or 10
Day 3	60	2 - 4	4 - 6	42 - 53	5 or 10
Day 4	60	2 - 4	4 - 6	42 - 53	5 or 10
Day 5	60	2 - 4	4 - 6	42 - 53	5 or 10

57. The minimum possible number of eggs that were sold on day 4 can be 42.

42 eggs are sold in the scenario when 10 eggs are left unsold.

So, the next day i.e. day 5, the minimum number of eggs that were sold can be calculated as

Out of the 60 eggs that were laid – maximum rotten and broken eggs can be removed which are 4 and 6 respectively. Thus, left with 50 eggs. Also, from the 10 eggs of the previous day maximum rotten and broken can be removed which are 4 and 2 respectively, thus left with 4 eggs only. So, out of the total 54 eggs, a maximum of only 10 eggs can be left unsold. Therefore, the minimum eggs that were sold on day 5 were 54 - 10 = 44.

Hence, aggregate sum of eggs is 42 + 44 = 86.

Note: Most of the students will make a mistake of considering 42 eggs for both the days but this is not possible on any two consecutive days simultaneously.

58. Number of eggs that got rotten and broken is maximum possible.

So, assume that on each day 10 eggs remain unsold at the end of each day.

So, out of these 10 eggs that remain unsold at the end of each day, the number of eggs that get rotten and broken on the next day is 4 and 2 respectively.

The maximum number of eggs that got rotten and broken from among the eggs laid each day is 4 and 6 respectively.

So, the number of eggs that got broken across all the five days

$$= 6 \times 5 + 2 \times 4 \\ = 38.$$

Number of eggs that got rotten across all the five days

$$= 4 \times 5 + 4 \times 4 \\ = 36.$$

$$\text{Required difference} = 38 - 36 = 2.$$

59. The maximum number of eggs that were left unsold at the end of the fifth day can be 10.

60. The maximum number of eggs that were sold on day 1 can be 49, in a scenario when 5 eggs were left unsold. In this case, the maximum number of eggs that were sold on day 2 can be calculated as

$$60(\text{laid on day 2}) - 2(\text{minimum rotten out of } 60) - 4(\text{minimum broken out of } 60) + 5(\text{previous days unsold eggs}) - 2(\text{rotten out of } 5) - 1(\text{broken out of } 5) - 5(\text{minimum unsold}) = 51$$

Since, on day 2 also, 5 eggs were left unsold the maximum number eggs sold on day 3 will again be 51. The same holds true for day 4 and day 5.

So, the maximum number of eggs that can be sold in the entire week can be $49 + 51 \times 4 = 253$.

Note: Most of the students will make a mistake of considering 53 eggs for any two consecutive days but this is not possible on any two consecutive days simultaneously.

61. Option (b) is a very general statement and suggests that everyone should always have trouble while trying to express himself. But the paragraph indicates that the student "... started speaking English and learnt how to express ..." Option (c) also contradicts this information. Option (a) gives a plausible explanation for the student's predicament. Refer to the line "It can be because of the circumstances I had or the culture I have." Thus, option (a) is the correct answer.
62. Refer to the first paragraph "This very peculiar kind ... some metal details". This makes option (c) the correct answer.
63. The second paragraph delves into this issue and the author mentions that: "And if we agree ... perceive signs of instability". Thus, option (a) is the correct answer.
64. Refer to the lines "Designers know this well and they are the first to perceive signs of instability ... Fashion delights us by playing on the tensions between these couples". Thus, option (b) is the correct answer.
65. Refer to the last line of the second paragraph "...nobody is interested in starting the ultimate trend, the final one". Thus, option (b) is the correct answer.
69. The wife of Surinder can be one of Dolly, Trisna or Kaveri, which cannot be determined.
70. Refer to the last 3 lines of the first paragraph. Option (c) follows from this and hence, is the correct answer.
71. Refer to the second and third paragraphs. The author explains that education results in the destruction of energy. Thus, option (b) is the correct answer.
72. Refer to the fifth paragraph "... controlling or disciplining this energy and letting it out in one direction and restricting it in another becomes merely a social convenience; the mind is shaped according to the pattern of a particular culture, and thereby its energy is gradually dissipated". Thus, option (b) is the correct answer.
73. Refer to the fifth paragraph "What is this energy which we all have? This energy is thinking, feeling; it is interest, enthusiasm, greed, passion, lust, ambition, and hate". Thus, option (d) is the correct answer.
74. Medals are symbols of the glorification of war. By stating that medals are nothing more than holes in a cloth, Atwood is criticizing the glorification of war. Thus, option (c) is the correct answer.
75. Options (a), (b) and (c) are various attributes of Atwood's novel, as described by the author of this passage. Option (d) is the odd one out – the author has used this term to describe an attribute of Iris, a character in the novel. The author has not used this term to describe the novel itself. Option (d) is thus, the odd one out and hence, is the correct answer.
76. Refer to the fifth paragraph "...a sense of the contentious nature of experience: there is a world of difference between the clipped prose of the pro-establishment local paper and the dead Laura's unfolding of emotion ..." Thus, option (b) is the correct answer.
77. Refer to the second paragraph, the author states explicitly "In her latest book Atwood explores again a theme central to her fictional universe: what happens to relationships, to human potential, to the possibility of happiness when women are kept subordinate, stultified by their inferior status and locked in silence". Thus, option (a) is the correct answer.

For questions 66 to 69:

Name	Wife	Place	Game
Gurvinder		Jaipur / Guntur	TT / Cricket
Surinder		Guntur / Jaipur	Cricket / TT
Mahinder	Sita	Ambala	Snooker
Bhupinder		Noida	Badminton
Harinder	Monica	Kapurthala	Volleyball
Joginder	Rama	Jammu	Football

66. The man from Kapurthala is Harinder and is married to Monica.
67. Mahinder plays Snooker and belongs to Ambala.
68. Badminton is being played by Bhupinder.

For questions 78 to 81:

According to the given conditions, the minimum score that a winning team can score in the first four sets is 25 and in the last set is 15.

From statements (iii) and (vi), it can be inferred that in one of the sets the score of Brazil and Russia were 12 and 25 respectively.

From statements (ii), (v) and (vi), there are two possibilities-

Case I: Russia scored the maximum score 30. In this case Russia cannot win any other set as it can win only two sets. In this scenario, Russia must lose a set with a score of either 25 or 30. With a score of 30 it cannot lose a set as 30 is the maximum score, thus it must have lost a set with a score of 25. In that case, Brazil must have scored 27.

Also, Russia scored 23 points in one of sets, which means Brazil must have scored 25 points (as Russia lost the set), Now, to make the total of Russia as 116, it must have scored 13 and to make the total of Brazil as 108, it must have scored 16 in the final set, which is not possible. Brazil can reach a score of 16 only when Russia scored 14 otherwise Brazil must have won at the score of 15. Thus, it can be said that Russia did not score 30 points.

	Brazil	Russia	
Set 1	12	25	
Set 2	28	30	
Set 3	27	25	
Set 4	25	23	
Set 5	16	13	(Not possible)
Total Score	108	116	

Case II: Brazil scored 30 points and Russia scored 28. Also, in one of the sets Russia scored 23 points. Now, there are again two possibilities - either Russia won the set as Brazil scored 21 points then it must be the fifth set or Russia lost the set as Brazil scored 25 points and it is one of the first four sets. If the first possibility is considered, in that case, Brazil must win the remaining two sets as Russia has already won two sets (12-25, 21-23) and to win two sets the minimum score of Brazil must be 25 in each set. But in this case, the total score of Brazil in all the five sets will become more than 108. Hence, Russia lost the set with the score of 23.

So the scores of three sets are tabulated below-

	Brazil	Russia
Set 1	12	25
Set 2	30	28
Set 3	25	23
Set 4		
Set 5		
Total Score	108	116

Now, the sum of the scores of Russia in the remaining two sets is $116 - (25 + 28 + 23) = 40$.

Also, from statement (ii) one of the scores of the remaining two sets of Russia must be one of 23 or 25 or 28.

So, the possible scores of Russia in the remaining two sets are (23, 17), (25, 15) and (28, 12). Also, the sum of the scores of Brazil in the remaining two sets must be $108 - (12 + 30 + 25) = 41$. The various possibilities are-

	Brazil	Russia		Brazil	Russia	
Set 4	23	25		Set 4	27	25
Set 5 (NP)	18	15		Set 5 (NP)	14	15
	Brazil	Russia		Brazil	Russia	
Set 4	21	23		Set 4	25	23
Set 5 (NP)	20	17		Set 5 (NP)	16	17
	Brazil	Russia		Brazil	Russia	
Set 4	30	28		Set 4	26	28
Set 5 (NP)	11	12		Set 5	15	12

* NP - Not Possible

78. The maximum difference by which a team won a set is 13 points.
79. The score of Russia in the fifth set is 12 points.
80. In three of the sets the score of Brazil was an even number.
81. The required common score was 25.
82. All of the above have been mentioned in the passage, except option (d). Thus, option (d) is the correct answer.
83. Refer to the line "Its course across the pond represents one of many paths it might take..." Option (a) contradicts this and hence, is the correct answer.
84. Refer to the fifth paragraph. Option (b) contradicts this and hence, is the correct answer.
85. Refer to the second paragraph. Option (b) is the correct answer.

86. Gauche means unsophisticated/socially awkward and Blandness describes the quality of being boring, plain, insipid. Thus, option (b) is the correct answer.
87. Divisiveness means creating dissension or discord. Nationalist would refer to a common thread, a binding force. Thus, option (a) is the correct answer.
88. The correct idiom in option (d) is 'neck and neck'. If two people who are competing are neck and neck, they are very close and either of them could win. To stick one's neck out for someone or something means to take a risk. If someone is described as a pain in the neck, he/she is an annoyance. If something is an albatross around your neck, it's something that you have done or are connected with that keeps causing you problems. Thus, option (d) is the correct answer.
89. Option (a) is erroneous as the correct phrase is 'to cry one's eyes out' and therefore the correct sentence should have been "She cried her eyes out after her husband died in a gruesome car accident." A bird's eye view refers to a view from a very high place which allows you to see a large area. If someone has a roving eye, they are sexually attracted to people other than their partner. The idiom "stars in one's eyes" means to be dazzled or enraptured. Thus, option (a) is the correct answer.
90. The correct answer is AAABB. Leech is a noun which refers to bloodsucking parasites that feed on others while leach is a verb which means to drain away from soil, ash, or similar material by the action of a percolating liquid, especially rainwater. Gulled means fooled while culled means slaughtered (generally used for killing animals). Abrasion refers to the process of wearing down or rubbing away by means of friction and aberration means deviation or abnormality. To attenuate means to lessen the intensity of something and to accentuate means to intensify or emphasize. Amorphous means shapeless while amorous means passionate and lustful. Thus, option (c) is the correct answer.

For questions 91 to 93:

The total number of different days of the week in January and February 2008 are as follows:

- Mondays: 8 (4 each in January and February)
- Tuesdays: 9 (5 in January and 4 in February)
- Wednesdays: 9 (5 in January and 4 in February)
- Thursdays: 9 (5 in January and 4 in February)
- Fridays: 9 (4 in January and 5 in February)
- Saturdays: 8 (4 each in January and February)
- Sundays: 8 (4 each in January and February)

Total number of days in January and February 2008 = 60
 Total number of days on which he drove the car of brand Honda

$$= 25 \% \text{ of } 60 = 15.$$

Total number of days on which he drove the car of brand BMW

$$= 15 \% \text{ of } 60 = 9.$$

Total number of days on which he drove the car of brand Hyundai

$$= 10 \% \text{ of } 60 = 6.$$

Given that $HO > ME > CH > BM > HY > FE$

So, we get that $15 > ME > CH > 9 > 6 > FE.$

We also know that

$$ME + CH + FE = 60 - (15 + 9 + 6) = 30.$$

91. Given that the number of days on which Mr. Alfonso drove the car of brand in January 2008 is the maximum.

Now, the car of brand Honda is only driven on either of the three days of any week, i.e. Monday, Tuesdays and Saturdays.

Total number of Mondays, Tuesdays and Saturdays in January 2008

$$= 4 + 5 + 4 = 13.$$

Total number of days in January and February 2008 on which he drove the car of brand Honda is equal to 15.

$$\text{Required Answer} = 15 - 13 = 2.$$

92. Mr. Alfonso drove Chevrolet on all possible Saturdays in January 2008 i.e. 4 days and all possible Thursdays in January 2008 and February 2008 i.e. 9 days.

⇒ He drove Chevrolet on 13 days and Mercedes on 14 days as $15 > ME > CH$

⇒ Number of days on which he drove Ferrari

$$= 30 - (13 + 14) = 3 \text{ days.}$$

93. Maximum number of days on which Mr. Alfonso can drove the Mercedes in given two months = 14

To minimize the number of number of days when he drove Mercedes in the given two months, we will maximize the number of days on which he drove Ferrari and Chevrolet.

He could drove Ferrari for a maximum of 5 days as $FE < 6.$

$$\Rightarrow ME + CH = 25 \text{ and } ME > CH$$

⇒ The minimum value of $ME = 13$

Difference between maximum and minimum value of $ME = 14 - 13 = 1.$

94. The correct answer is AAAAB. Bellow means to roar or to shout while billow means to puff, swell or fill with something. Blandish means to coax someone with kind words or flattery and brandish means to exhibit something aggressively. Credence means belief in something or accepting something as true and cadence means rhythm or beat. Delirious means to be in a disturbed state of mind while deleterious means harmful. To decry means to denounce or criticize someone while descry means to catch sight of something. Thus, option (d) is the correct answer.
95. The correct answer is BAABB. Diffident means lacking self-confidence while dissident means a rebel or a non-conformist. Conflagrate means to inflame or incite and conflate means to mix different types of elements together. Immiseration means economic impoverishment and commiseration means pity or sympathy. Secede means to withdraw or disaffiliate from an organization/group while cede means to yield or surrender. Beacon means a shining example or a guiding light while beckon refers to a gesture to summon someone. Thus, option (b) is the correct answer.
96. The coherent sequence is bda. Statement b begins the discussion about filming of videos by drones around the world and d talks about one such video recorded on a safari in the Serengeti. Statement a should follow d because it carries forward the idea of the video recorded on the safari by giving details of what the video contains. Option (c) is the odd sentence because it talks about waves and surfers, which have nothing to do with the safari. Thus, option (c) is the correct answer.
97. The coherent sequence is dca. Statement d criticizes England's trickeries and amateurishness in the final session. Statement c carries forward this idea by giving an example and questioning the practice in English public schools. Statement a should follow c as it states the consequence of the situation mentioned in c. Only option (b) contrasts England's and Australia's spirit of cricket and hence, is the odd sentence. Thus, option (b) is the correct answer.
98. The coherent sequence is cad. Sentence c states that the US dishes out military aid to Mexico without bothering about how it is used and a further elaborates on this. Statement d discusses the possibility of the aid (mentioned in a) being spent on extrajudicial executions. Only option (b) discusses that America should look at alternatives to a military response. Thus, option (b) is the correct answer.
99. Option (c) uses 'their' instead of 'there'. The other incorrect options have subject verb agreement errors. Option (d) is the correct answer.
100. Sentence 2 should be corrected to 'its sequel' and sentence 3 should contain 'the easier'. Thus, option (b) is the correct answer.

