Question Paper with Solutions

CAT 2008

CAT 2008 Actual Paper

Instructions:

1. The Test Paper contains 90 questions. The duration of the test is 150 minutes.
2. The paper is divided into three sections. Section-I: 25 Q:, Section-II: 25 Q:, Section-III: 40 Q.
3. Wrong answers carry negative marks. There is only one correct answer for each question.

Section – I

1. The integers 1, 2, …, 40 are written on a blackboard. The following operation is then repeated 39 times: In each repetition, any two numbers, say a and b, currently on the blackboard are erased and a new number a + b – 1 is written. What will be the number left on the board at the end?
   (1) 820　　　　(2) 821　　　　(3) 781　　　　(4) 819　　　　(5) 780

2. What are the last two digits of 7^{2008}?
   (1) 21　　　　(2) 61　　　　(3) 01　　　　(4) 41　　　　(5) 81

3. If the roots of the equation $x^3 - ax^2 + bx - c = 0$ are three consecutive integers, then what is the smallest possible value of b?

   (1) $-\dfrac{1}{\sqrt{3}}$　　　(2) –1　　　(3) 0　　　(4) 1　　　(5) $\dfrac{1}{\sqrt{3}}$

4. A shop stores x kg of rice. The first customer buys half this amount plus half a kg of rice. The second customer buys half the remaining amount plus half a kg of rice. Then the third customer also buys half the remaining amount plus half a kg of rice. Thereafter, no rice is left in the shop. Which of the following best describes the value of x?
   (1) $2 \le x \le 6$　　　　　　(2) $5 \le x \le 8$　　　　　　(3) $9 \le x \le 12$
   (4) $11 \le x \le 14$　　　　　(5) $13 \le x \le 18$

Directions for Questions 5 and 6:
Let $f(x) = ax^2 + bx + c$, where a, b and c are certain constants and $a \ne 0$ It is known that f(5) = – 3f(2) and that 3 is a root of f(x) = 0.

5. What is the other root of f(x) = 0?
   (1) –7　　　　　　　(2) – 4　　　　　　　(3) 2
   (4) 6　　　　　　　(5) cannot be determined

6. What is the value of a + b + c?
   (1) 9　　　　　　　(2) 14　　　　　　　(3) 13
   (4) 37　　　　　　　(5) cannot be determined

7. The number of common terms in the two sequences 17, 21, 25,…, 417 and 16, 21, 26,…, 466 is
   (1) 78   (2) 19   (3) 20   (4) 77   (5) 22

8. How many integers, greater than 999 but not greater than 4000, can be formed with the digits 0, 1, 2, 3 and 4, if repetition of digits is allowed?
   (1) 499   (2) 500   (3) 375   (4) 376   (5) 501

Directions for questions 9 and 10:
The figure below shows the plan of a town. The streets are at right angles to each other. A rectangular park (P) is situated inside the town with a diagonal road running through it. There is also a prohibited region (D) in the town.
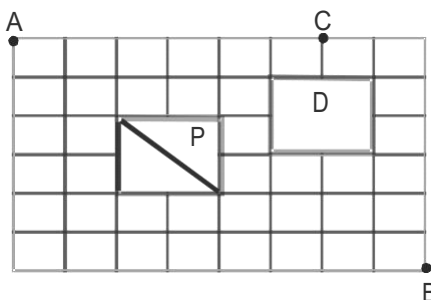
9. Neelam rides her bicycle from her house at A to her office at B, taking the shortest path. Then the number of possible shortest paths that she can choose is
   (1) 60   (2) 75   (3) 45   (4) 90   (5) 72

10. Neelam rides her bicycle from her house at A to her club at C, via B taking the shortest path. Then the number of possible shortest paths that she can choose is
    (1) 1170   (2) 630   (3) 792   (4) 1200   (5) 936

11. Let $f(x)$ be a function satisfying $f(x)f(y) = f(xy)$ for all real x, y. If $f(2) = 4$, then what is the value of $f\left(\left|\frac{1}{2}\right|\right)$?

    (1) 0   (2) $\frac{1}{4}$ (3) $\frac{1}{2}$

    (4) 1   (5) cannot be determined

12. Suppose, the seed of any positive integer n is defined as follows:
    $$seed(n) = n, \text{ if } n < 10$$
    $$= seed(s(n)), \text{ otherwise,}$$
    where s(n) indicates the sum of digits of n. For example,
    seed(7) = 7, seed(248) = seed(2 + 4 + 8) = seed(14) = seed(1 + 4) = seed(5) = 5 etc. How many positive integers n, such that n < 500, will have seed (n) = 9?
    (1) 39   (2) 72   (3) 81   (4) 108   (5) 55

13. In a triangle ABC, the lengths of the sides AB and AC equal 17.5 cm and 9 cm respectively. Let D be a point on the line segment BC such that AD is perpendicular to BC. If AD = 3 cm, then what is the radius (in cm) of the circle circumscribing the triangle ABC?
    (1) 17.05   (2) 27.85   (3) 22.45   (4) 32.25   (5) 26.25

14. Consider obtuse-angled triangles with sides 8 cm, 15 cm and x cm. If x is an integer, then how many such triangles exist?
    (1) 5   (2) 21   (3) 10   (4) 15   (5) 14

15. Consider a square ABCD with midpoints E, F, G, H of AB, BC, CD and DA respectively. Let L denote the line passing through F and H. Consider points P and Q, on L and inside ABCD, such that the angles APD and BQC both equal 120°. What is the ratio of the area of ABQCDP to the remaining area inside ABCD?
    (1) $\dfrac{4\sqrt{2}}{3}$ (2) $2 + \sqrt{3}$ (3) $\dfrac{10 - 3\sqrt{3}}{9}$ (4) $1 + \dfrac{1}{\sqrt{3}}$ (5) $2\sqrt{3} - 1$

16. What is the number of distinct terms in the expansion of $(a + b + c)^{20}$?
    (1) 231   (2) 253   (3) 242   (4) 210   (5) 228

Directions for Questions 17 and 18:
Five horses, Red, White, Grey, Black and Spotted participated in a race. As per the rules of the race, the persons betting on the winning horse get four times the bet amount and those betting on the horse that came in second get thrice the bet amount. Moreover, the bet amount is returned to those betting on the horse that came in third, and the rest lose the bet amount. Raju bets Rs. 3000, Rs. 2000 and Rs. 1000 on Red, White and Black horses respectively and ends up with no profit and no loss.

17. Which of the following cannot be true?
    (1) At least two horses finished before Spotted
    (2) Red finished last
    (3) There were three horses between Black and Spotted
    (4) There were three horses between White and Red
    (5) Grey came in second

18. Suppose, in addition, it is known that Grey came in fourth. Then which of the following cannot be true?
    (1) Spotted came in first
    (2) Red finished last
    (3) White came in second
    (4) Black came in second
    (5) There was one horse between Black and White

Directions for Questions 19 and 20:
Mark (1) if Q can be answered from A alone but not from B alone.
Mark (2) if Q can be answered from B alone but not from A alone.
Mark (3) if Q can be answered from A alone as well as from B alone.
Mark (4) if Q can be answered from A and B together but not from any of them alone.
Mark (5) if Q cannot be answered even from A and B together.

In a single elimination tournament, any player is eliminated with a single loss. The tournament is played in multiple rounds subject to the following rules :
(a) If the number of players, say n, in any round is even, then the players are grouped into n/2 pairs. The players in each pair play a match against each other and the winner moves on to the next round.
(b) If the number of players, say n, in any round is odd, then one of them is given a bye, that is he automatically moves on to the next round. The remaining (n–1) players are grouped into (n–1)/2 pairs. The players in each pair play a match against each other and the winner moves on to the next round. No player gets more than one bye in the entire tournament.

Thus, if n is even, then n/2 players move on to the next round while if n is odd, then (n+1)/2 players move on to the next round. The process is continued till the final round, which obviously is played between two players. The winner in the final round is the champion of the tournament.

19. What is the number of Matches played by the champion?
   A. The entry list for the tournament consists of 83 players.
   B. The champion received one bye.

20. If the number of players, say n, in the first round was between 65 and 128, then what is the exact value of n?
   A. Exactly one player received a bye in the entire tournament.
   B. One player received a bye while moving on to the fourth round from the third round.

21. Two circles, both of radii 1 cm, intersect such that the circumference of each one passes through the centre of the other. What is the area (in sq. cm.) of the intersecting region?
   (1) $\dfrac{\pi}{3} - \dfrac{\sqrt{3}}{4}$
   (2) $\dfrac{2\pi}{3} + \dfrac{\sqrt{3}}{2}$
   (3) $\dfrac{4\pi}{3} - \dfrac{\sqrt{3}}{2}$
   (4) $\dfrac{4\pi}{3} + \dfrac{\sqrt{3}}{2}$
   (5) $\dfrac{2\pi}{3} - \dfrac{\sqrt{3}}{2}$

22. Rahim plans to drive from city A to station C, at the speed of 70 km per hour, to catch a train arriving there from B. He must reach C at least 15 minutes before the arrival of the train. The train leaves B, located 500 km south of A, at 8:00 am and travels at a speed of 50 km per hour. It is known that C is located between west and northwest of B, with BC at 60° to AB. Also, C is located between south and southwest of A with AC at 30° to AB. The latest time by which Rahim must leave A and still catch the train is closest to
   (1) 6 : 15 am   (2) 6 : 30 am   (3) 6 :45 am
   (4) 7 : 00 am   (5) 7 : 15 am

23. Three consecutive positive integers are raised to the first, second and third powers respectively and then added. The sum so obtained is perfect square whose square root equals the total of the three original integers. Which of the following best describes the minimum, say m, of these three integers?

(1) $1 \le m \le 3$ (2) $4 \le m \le 6$ (3) $7 \le m \le 9$

(4) $10 \le m \le 12$ (5) $13 \le m \le 15$

24. Find the sum $\sqrt{1+\dfrac{1}{1^2}+\dfrac{1}{2^2}} + \sqrt{1+\dfrac{1}{2^2}+\dfrac{1}{3^2}} + \ldots + \sqrt{1+\dfrac{1}{2007^2}+\dfrac{1}{2008^2}}$

(1) $2008 - \dfrac{1}{2008}$ (2) $2007 - \dfrac{1}{2007}$ (3) $2007 - \dfrac{1}{2008}$

(4) $2008 - \dfrac{1}{2007}$ (5) $2008 - \dfrac{1}{2009}$

25. Consider a right circular cone of base radius 4 cm and height 10 cm. A cylinder is to be placed inside the cone with one of the flat surfaces resting on the base of the cone. Find the largest possible total surface area (in sq. cm) of the cylinder.

(1) $\dfrac{100\pi}{3}$ (2) $\dfrac{80\pi}{3}$ (3) $\dfrac{120\pi}{7}$ (4) $\dfrac{130\pi}{9}$ (5) $\dfrac{110\pi}{7}$

Section − II

Directions for Questions 26 to 28: Answer the following questions based on the statements given below:

(i)   There are three houses on each side of the road.
(ii)   These six houses are labeled as P, Q, R, S, T and U.
(iii)   The houses are of different colours, namely, Red, Blue, Green, Orange, Yellow and White.
(iv)   The houses are of different heights.
(v)   T, the tallest house, is exactly opposite to the Red coloured house.
(vi)   The shortest house is exactly opposite to the Green coloured house.
(vii)   U, the Orange coloured house, is located between P and S.
(viii) R, the Yellow coloured house, is exactly opposite to P.
(ix)   Q, the Green coloured house, is exactly opposite to U.
(x)   P, the White coloured house, is taller than R, but shorter than S and Q.

26.   What is the colour of the house diagonally opposite to the Yellow coloured house?
              (1) White   (2) Blue   (3) Green
       (4) Red   (5) none of these

27.   Which is the second tallest house?
       (1) P   (2) S   (3) Q
       (4) R   (5) cannot be determined

28.   What is the colour of the tallest house?
       (1) Red   (2) Blue   (3) Green
       (4) Yellow   (5) none of these

Directions for questions 29 to 31: Answer the following questions based on the information given below:

Telecom operators get revenue from transfer of data and voice. Average revenue received from transfer of each unit of data is known as ARDT. In the diagram below, the revenue received from data transfer as percentage of total revenue received and the ARDT in US Dollars (USD) are given for various countries.
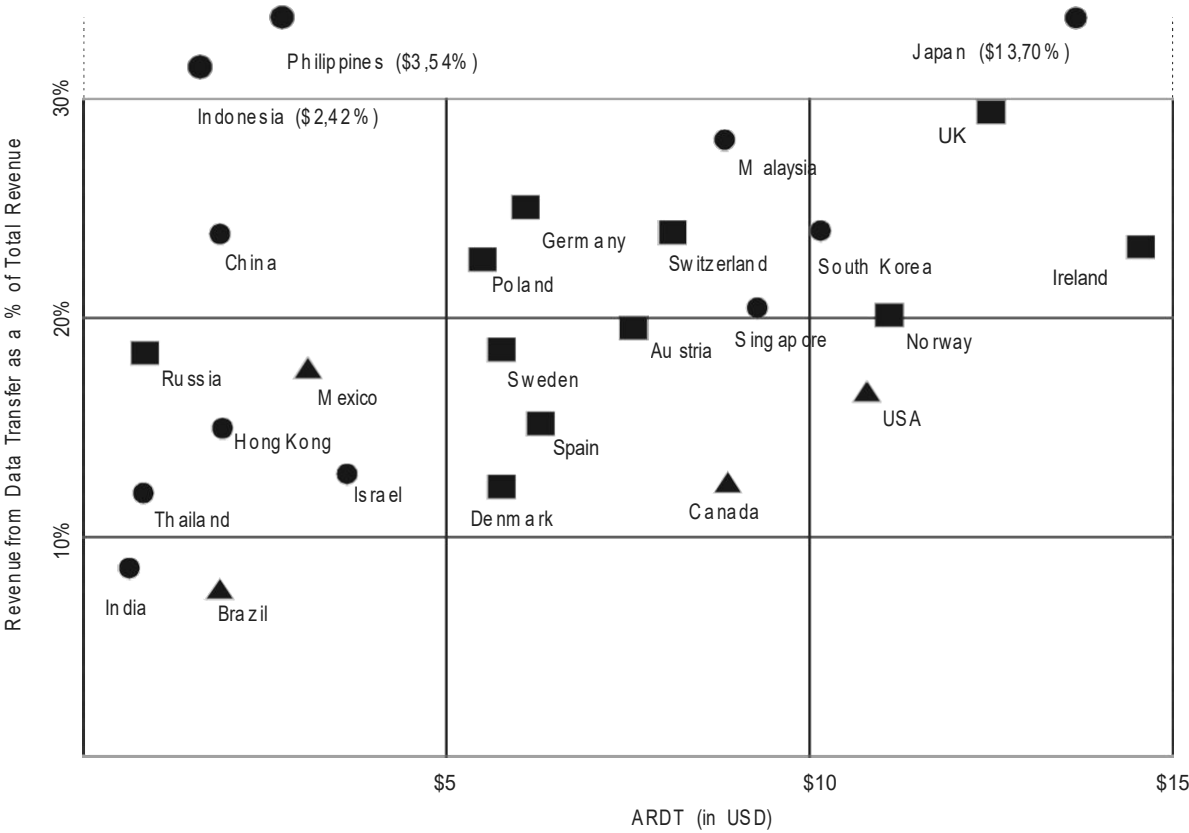
Legend : ● ASIA   ■ EUROPE   ▲ AMERICAS

29. It was found that the volume of data transfer in India is the same as that of Singapore. Then which of the following statements is true?
    (1) Total revenue is the same in both countries.
    (2) Total revenue in India is about 2 times that of Singapore.
    (3) Total revenue in India is about 4 times that of Singapore.
    (4) Total revenue in Singapore is about 2 times that of India.
    (5) Total revenue in Singapore is about 4 time that of India.

30. It is expected that by 2010, revenue from data transfer as a percentage of total revenue will triple for India and double for Sweden. Assume that in 2010, the total revenue in India is twice that of Sweden and that the volume of data transfer is the same in both the countries. What is the percentage increase of ARDT in India if there is no change in ARDT in Sweden?
    (1) 400%   (2) 550%   (3) 800%
    (4) 950%   (5) cannot be determined

31. If the total revenue received is the same for the pairs of countries listed in the choices below, choose the pair that has approximately the same volume of data transfer.
   (1) Philippines and Austria
   (2) Canada and Poland
   (3) Germany and USA
   (4) UK and Spain
   (5) Denmark and Mexico

Directions for Questions 32 to 34: Answer the following questions based on the information given below:

For admission to various affiliated colleges, a university conducts a written test with four different sections, each with a maximum of 50 marks. The following table gives the aggregate as well as the sectional cut-off marks fixed by six different colleges affiliated to the university. A student will get admission only if he/she gets marks greater than or equal to the cut-off marks in each of the sections and his/her aggregate marks are at least equal to the aggregate cut-off marks as specified by the college.

	Sectional Cut – off Marks				Aggregate Cut-off Marks
	Section A	Section B	Section C	Section D	
College 1	42	42	42		176
College 2		45	45		175
College 3			46		171
College 4	43			45	178
College 5	45		43		180
College 6		41		44	176

32. Bhama got calls from all colleges. What could be the minimum aggregate marks obtained by her?
   (1) 180   (2) 181   (3) 196   (4) 176   (5) 184

33. Charlie got calls from two colleges. What could be the minimum marks obtained by him in a section?
   (1) 0   (2) 21   (3) 25   (4) 35   (5) 41

34. Aditya did not get a call from even a single college. What could be the maximum aggregate marks obtained by him?
   (1) 181   (2) 176   (3) 184   (4) 196   (5) 190

Directions for Questions 35 to 38: Answer the following questions based on the information given below: In a sports event, six teams (A, B, C, D, E and F) are competing against each other. Matches are scheduled in two stages. Each team plays three matches in stage – I and two matches in Stage – II. No team plays against the same team more than once in the event. No ties are permitted in any of the matches. The observations after the completion of Stage – I and Stage – II are as given below.

Stage-I:
- One team won all the three matches.
- Two teams lost all the matches.
- D lost to A but won against C and F.
- E lost to B but won against C and F.
- B lost at least one match.
- F did not play against the top team of Stage-I.

Stage-II:

- The leader of Stage-I lost the next two matches.
- Of the two teams at the bottom after Stage-I, one team won both matches, while the other lost both matches.
- One more team lost both matches in Stage-II.

35. The two teams that defeated the leader of Stage-I are:
    (1) F & D   (2) E & F   (3) B & D   (4) E & D   (5) F & D

36. The only team(s) that won both matches in Stage-II is (are):
    (1) B   (2) E & F   (3) A, E & F   (4) B, E & F   (5) B & F

37. The teams that won exactly two matches in the event are:
    (1) A, D & F   (2) D & E   (3) E & F   (4) D, E & F   (5) D & F

38. The team(s) with the most wins in the event is (are):
    (1) A   (2) A & C   (3) F   (4) E   (5) B & E

Directions for Questions 39 to 42: Answer the following questions based on the information given below: The bar chart below shows the revenue received in million US Dollars (USD), from subscribers to a particular Internet service. The data covers the period 2003 to 2007 for the United States (US) and Europe. The bar chart also shows the estimated revenues from subscription to this service for the period 2008 to 2010.
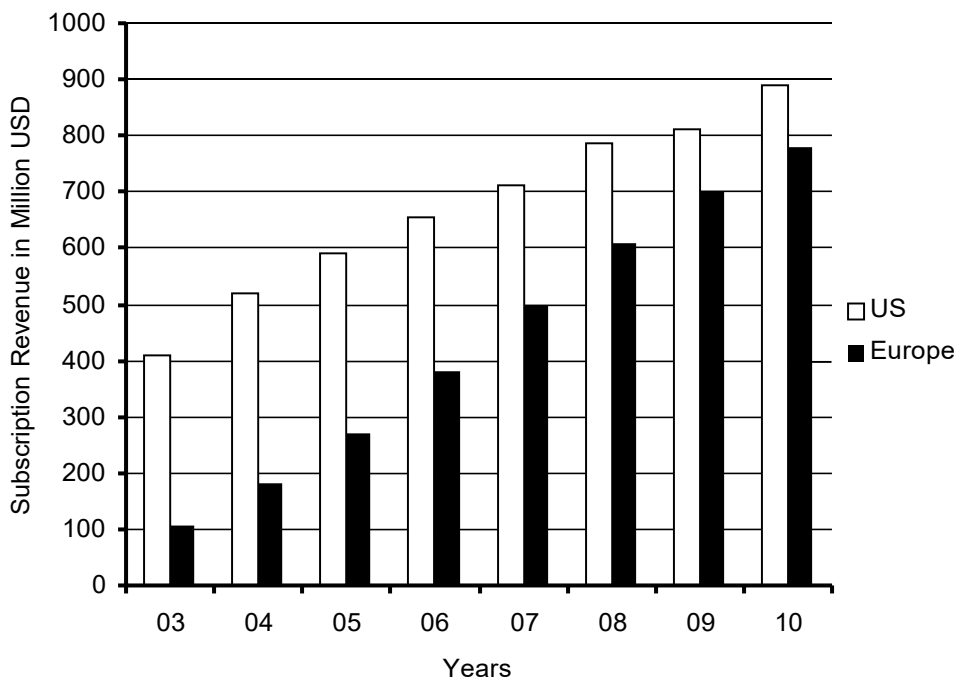
39. The difference between the estimated subscription in Europe in 2008 and what it would have been if it were computed using the percentage growth rate of 2007 (over 2006), is closest to:
    (1) 50   (2) 80   (3) 20   (4) 10   (5) 0

40. In 2003, sixty percent of subscribers in Europe were men. Given that women subscribers increase at the rate of 10 percent per annum and men at the rate of 5 percent per annum, what is the approximate percentage growth of subscribers between 2003 and 2010 in Europe? The subscription prices are volatile and may change each year.
   (1) 62   (2) 15   (3) 78   (4) 84   (5) 50

41. Consider the annual percent change in the gap between subscription revenues in the US and Europe. What is the year in which the absolute value of this change is the highest?
   (1) 03 - 04   (2) 05 - 06   (3) 06 - 07   (4) 08 - 09   (5) 09 - 10

42. While the subscription in Europe has been growing steadily towards that of the US, the growth rate in Europe seems to be declining. Which of the following is closest to the percent change in growth rate of 2007 (over 2006) relative to the growth rate of 2005 (over 2004)?
   (1) 17   (2) 20   (3) 35   (4) 60   (5) 100

Directions for questions 43 to 47: Answer the following questions based on the information given below:

Abdul, Bikram and Chetan are three professional traders who trade in shares of a company XYZ Ltd. Abdul follows the strategy of buying at the opening of the day at 10 am and selling the whole lot at the close of the day at 3 pm. Bikram follows the strategy of buying at hourly intervals: 10 am, 11 am, 12 noon, 1 pm, and 2 pm, and selling the whole lot at the close of the day. Further, he buys an equal number of shares in each purchase. Chetan follows a similar pattern as Bikram but his strategy is somewhat different. Chetan's total investment amount is divided equally among his purchases. The profit or loss made by each investor is the difference between the sale value at the close of the day less the investment in purchase. The "return" for each investor is defined as the ratio of the profit or loss to the investment amount expressed as a percentage.

43. On a day of fluctuating market prices, the share price of XYZ Ltd. ends with a gain, i.e, it is higher at the close of the day compared to the opening value. Which trader got the maximum return on that day?
   (1) Bikram
   (2) Chetan
   (3) Abdul
   (4) Bikram or Chetan
   (5) cannot be determined

44. Which one of the following statements is always true?
   (1) Abdul will not be one with the minimum return
   (2) Return for Chetan will be higher than that of Bikram
   (3) Return for Bikram will be higher than that of Chetan
   (4) Return for Chetan cannot be higher than that of Abdul
   (5) none of the above

45. On a "boom" day the share price of XYZ Ltd. keeps rising throughout the day and peaks at the close of the day. Which trader got the minimum return on that day?
   (1) Bikram   (2) Chetan   (3) Abdul
   (4) Abdul or Chetan   (5) cannot be determined

One day, two other traders, Dane and Emily joined Abdul, Bikram and Chetan for trading in the shares of XYZ Ltd. Dane followed a strategy of buying equal numbers of shares at 10 am. 11 am and 12 noon, and selling the same numbers at 1 pm, 2 pm and 3 pm. Emily, on the other hand, followed the strategy of buying shares using all her money at 10 am and selling all of them at 12 noon and again buying the shares for all the money at 1 pm and again selling all of them at the close of the day at 3 pm. At the close of the day the following was observed.

    i.   Abdul lost money in the transactions.
    ii.   Both Dane and Emily made profits.
    iii.   There was an increase in share price during the closing hour compared to the price at 2 pm.
    iv.   Share price at 12 noon was lower than the opening price

46.   Share price was at its highest at
    (1) 10 am   (2) 11 am   (3) 12 noon
    (4) 1 pm   (5) cannot be determined

47.   Which of the following is necessarily false?
    (1) Share price was at its lowest at 2 pm
    (2) Share price was at its lowest at 11 am
    (3) Share price at 1 pm was higher than the share price at 2 pm
    (4) Share price at 1 pm was higher than the share price at 12 noon
    (5) none of the above

Directions for Questions 48 to 50: Answer the following questions based on the information given below:

There are 100 employees in an organization across five departments. The following table gives the department-wise distribution of average age, average basic pay and allowances. The gross pay of an employee is the sum of his/her basic pay and allowances.

Department	Number of Employees	Average Age (Years)	Average Basic Pay (Rs.)	Allowances (% of Basic Pay)
HR	5	45	5000	70
Marketing	30	35	6000	80
Finance	20	30	6500	60
Business Development	35	42	7500	75
Maintenance	10	35	5500	50

There are limited numbers of employees considered for transfer/promotion across departments. Whenever a person is transferred/promoted from a department of lower average age to a department of higher average age, he/she will get an additional allowance of 10% of basic pay over and above his/her current allowance. There will not be any change in pay structure if a person is transferred/promoted from a department with higher average age to a department with lower average age.

Questions below are independent of each other.

48.   What is the approximate percentage change in the average gross of the HR department due to transfer of a 40-year old person with basic pay of Rs. 8000 from the Marketing department?
    (1) 9%   (2) 11%   (3) 13%   (4) 15%   (5) 17%

49. There was a mutual transfer of an employee between Marketing and Finance departments and transfer of one employee from Marketing to HR. As a result, the average age of Finance department increased by one year and that of Marketing department remained the same. What is the new average age of HR department?
    (1) 30   (2) 35   (3) 40
    (4) 45   (5) cannot be determined

50. If two employees (each with a basic pay of Rs. 6000) are transferred from Maintenance department to HR department and one person (with a basic pay of Rs. 8000) was transferred from Marketing department to HR department, what will be the percentage change in average basic pay of HR department?
    (1) 10.5%   (2) 12.5%   (3) 15%   (4) 30%   (5) 40%

Section – III

Directions for Questions 51 to 54: In each of the following questions there are sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are correct in terms of grammar and usage (including spelling, punctuation and logical consistency). Then, choose the **most appropriate option.**

51. A. In 1849, a poor Bavarian imigrant named Levi Strauss
    B. landed in San Francisco, California,
    C. at the invitation of his brother-in-law David Stern
    D. owner of dry goods business.
    E. This dry goods business would later became known as Levi Strauss & Company.
    (1) B only   (2) B and C   (3) A and B   (4) A only   (5) A, B and D

52. A. In response to the allegations and condemnation pouring in,
    B. Nike implemented comprehensive changes in their labour policy.
    C. Perhaps. sensing the rising tide of global labour concerns,
    D. from the public would become a prominent media issue,
    E. Nike sought to be a industry leader in employee relations.
    (1) D and E   (2) D only   (3) A and E   (4) A and D   (5) B, C and E

53. A. Charges and countercharges mean nothing
    B. to the few million who have lost their home.
    C. The nightmare is far from over, for the government
    D. is still unable to reach hundreds who are marooned.
    E. The death count have just begun.
    (1) A only   (2) C only   (3) A and C   (4) A, C and D   (5) D only

54. A. I did not know what to make of you.
    B. Because you'd lived in India, I associate you more with my parents than with me.
    C. And yet you were unlike my cousins in Calcutta, who seem so innocent and obedient when I visited them.
    D. You were not curious about me in the least.
    E. Although you did make effort to meet me.
    (1) A only   (2) A and B   (3) A and E   (4) D only   (5) A and D

Directions for Questions 55 to 58: In each question, there are five sentences. Each sentence has a pair of words that are italicized and highlighted. From the italicized and highlighted 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** one.

55. Anita wore a beautiful **broach (A)/brooch (B)** on the lapel of her jacket.
    If you want to complain about the amenities in your neighbourhood, please meet your **councillor(A)/counsellor(B).**
    I would like your **advice(A)/advise(B)** on which job I should choose.
    The last scene provided a **climactic(A)/climatic(B)** ending to the film.
    Jeans that **flair(A)/flare(B)** at the bottom are in fashion these days.
    (1) BABAA   (2) BABAB   (3) BAAAB   (4) ABABA   (5) BAABA

56. The cake had lots of **currents(A)/currants(B)** and nuts in it.
    If you engage in such **exceptional(A)/exceptionable(B)** behaviour, I will be forced to punish you.
    He has the same capacity as an adult to **consent(A)/assent(B)** to surgical treatment.
    The minister is **obliged (A)/compelled(B)** to report regularly to a parliamentary board.
    His analysis of the situation is far too **sanguine(A)/genuine(B).**
    (1) BBABA   (2) BBAAA   (3) BBBBA   (4) ABBAB   (5) BABAB

57. She managed to bite back the **ironic(A)/caustic(B)** retort on the tip of her tongue.
    He gave an impassioned and **valid(A)/cogent(B)** plea for judicial reform.
    I am not **adverse(A)/averse(B)** to helping out.
    The **coupé(A)/coup(B)** broke away as the train climbed the hill.
    They heard the bells **peeling(A)/pealing(B)** far and wide.
    (1) BBABA   (2) BBBAB   (3) BAABB   (4) ABBAA   (5) BBBBA

58. We were not successful in **defusing(A)/diffusing(B)** the Guru's ideas.
    The students **baited(A)/bated(B)** the instructor with irrelevant questions.
    The **hoard(A)/horde(B)** rushed into the campus.
    The prisoner's **interment(A)/interment(B)** came to an end with his early release.
    The hockey team could not deal with his **unsociable(A)/unsocial(B)** tendencies.
    (1) BABBA   (2) BBABB   (3) BABAA   (4) ABBAB   (5) AABBA

Directions for Questions 59 to 62: In each of the questions, a word has been used in sentences in five different ways. Choose the option corresponding to the sentence in which the usage of the word is **incorrect or inappropriate.**

59. **Run**
    (1) I must run fast to catch up with him.
    (2) Our team scored a goal against the run of play.
    (3) You can't run over him like that.
    (4) The newly released book is enjoying a popular run.
    (5) This film is a run-of-the-mill production.

60. **Round**
    (1) The police fired a round of tear gas shells.
    (2) The shop is located round the corner.
    (3) We took a ride on the merry-go-round.
    (4) The doctor is on a hospital round.
    (5) I shall proceed further only after you come round to admitting it.

61. **Buckle**
    (1) After the long hike our knees were beginning to buckle.
    (2) The horse suddenly broke into a buckle.
    (3) The accused did not buckle under police interrogation.
    (4) Sometimes, an earthquake can make a bridge buckle.
    (5) People should learn to buckle up as soon as they get into a car.

62. **File**
    (1) You will find the paper in the file under C.
    (2) I need to file an insurance claim.
    (3) The cadets were marching in a single file.
    (4) File your nails before you apply nail polish.
    (5) When the parade was on, a soldier broke the file.

Directions for Questions 63 to 66: Each of the following questions has a sentence with two blanks. Given below each question are five pairs of words. Choose the pair that best completes the sentence.

63. The genocides in Bosnia and Rwanda, apart from being mis-described in the most sinister and _____ manner as 'ethnic cleansing', were also blamed, in further hand-washing rhetoric, on something dark and interior to _____ and perpetrators alike.
    (1) innovative; communicator   (2) enchanting; leaders
    (3) disingenuous; victims   (4) exigent; exploiters
    (5) tragic; sufferers

64. As navigators, calendar makers, and other _____ of the night sky accumulated evidence to the contrary, ancient astronomers were forced to_____that certain bodies might move in circles about points, which in turn moved in circles about the earth.
    (1) scrutinizers; believe   (2) observers; agree
    (3) scrutinizers; suggest   (4) observers; concede
    (5) students; conclude

65. Every human being, after the first few days of his life, is a product of two factors: on the one hand, there is his_____endowment; and on the other hand, there is the effect of environment, including _____
    (1) constitutional; weather   (2) congenital; education
    (3) personal; climate   (4) economic; learning
    (5) genetic; pedagogy

66. Exhaustion of natural resources, destruction of individual initiative by governments, control over men's minds by central_____of education and propaganda are some of the major evils which appear to be on the increase as a result of the impact of science upon minds suited by _____ to an earlier kind of world.

    (1) tenets; fixation
    (2) aspects; inhibitions
    (3) institutions; inhibitions
    (4) organs; tradition
    (5) departments; repulsion

Directions for Questions 67 to 70: Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the sentence that completes the paragraph in the most **appropriate way.**

67. Most people at their first consultation take a furtive look at the surgeon's hands in the hope of reassurance. Prospective patients look for delicacy, sensitivity, steadiness, perhaps unblemished pallor. On this basis, Henry Perowne loses a number of cases each year. Generally, he knows it's about to happen before the patient does: the downward glance repeated, the prepared questions beginning to falter, the overemphatic thanks during the retreat to the door.

    (1) Other people do not communicate due to their poor observation.
    (2) Other patients don't like what they see but are ignorant of their right to go elsewhere.
    (3) But Perowne himself is not concerned.'
    (4) But others will take their place, he thought.
    (5) These hands are steady enough, but they are large.

68. Trade protectionism, disguised as concern for the climate, is raising its head. Citing competitive-ness concerns, powerful industrialized countries are holding out threats of a levy **on** imports of energy-intensive products from developing countries that refuse to accept their demands. The actual source of protectionist sentiment in the OECD countries is, of course, their current lacklustre economic performance, combined with the challenges posed by the rapid economic rise of China and India - in that order.

    (1) Climate change is evoked to bring trade protectionism through the back door.
    (2) OECD countries are taking refuge in climate change issues to erect trade barriers against these two countries.
    (3) Climate change concerns have come as a convenient stick to beat the rising trade power of China and India.
    (4) Defenders of the global economic status quo are posing as climate change champions.
    (5) Today's climate change champions are the perpetrators of global economic inequity.

69. Mattancherry is Indian Jewry's most famous settlement. Its pretty streets of pastel coloured houses, connected by first-floor passages and home to the last twelve saree-and-sarong-wearing, white-skinned Indian Jews are visited by thousands of tourists each year. Its synagogue, built in *1568,* with a floor of blue-and-white Chinese tiles, a carpet given by Haile Selassie and the frosty Yaheh selling tickets at the door, stands as an image of religious tolerance.

    (1) Mattancherry represents, therefore, the perfect picture of peaceful co-existence.
    (2) India's Jews have almost never suffered discrimination, except for European colonizers and each other.
    (3) Jews in India were always tolerant.
    (4) Religious tolerance has always been only a façade and nothing more.
    (5) The pretty pastel streets are, thus, very popular with the tourists.

70. Given the cultural and intellectual interconnections, the question of what is 'Western' and what is 'Eastern' (or 'Indian') is often hard to decide, and the issue can be discussed only in more dialectical terms. The diagnosis of a thought as 'purely Western' or 'purely Indian' can be very illusory.
    (1) Thoughts are not the kind of things that can be easily categorized.
    (2) Though 'occidentalism' and 'orientalism' as dichotomous concepts have found many adherents.
    (3) 'East is East and West is West' has been a discredited notion for a long time now.
    (4) Compartmentalizing thoughts is often desirable.
    (5) The origin of a thought is not the kind of thing to which 'purity' happens easily.

Directions for Questions 71 to 75: The passage given below is followed by a set of five questions. Choose the **most appropriate** answer to each question.

When I was little, children were bought two kinds of ice cream, sold from those white wagons with canopies made of silvery metal: either the two-cent cone or the four-cent ice-cream pie. The two-cent cone was very small, in fact it could fit comfortably into a child's hand, and it was made by taking the ice cream from its container with a special scoop and piling it on the cone. Granny always suggested I eat only a part of the cone, then throw away the pointed end, because it had been touched by the vendor's hand (though that was the best part, nice and crunchy, and it was regularly eaten in secret, after a pretence of discarding it).

The four-cent pie was made by a special little machine, also silvery, which pressed two disks of sweet biscuit against a cylindrical section of ice cream. First you had to thrust your tongue into the gap between the biscuits until it touched the central nucleus of ice cream; then, gradually, you ate the whole thing, the biscuit surfaces softening as they became soaked in creamy nectar. Granny had no advice to give here: in theory the pies had been touched only by the machine; in practice, the vendor had held them in his hand while giving them to us, but it was impossible to isolate the contaminated area.

I was fascinated, however, by some of my peers, whose parents bought them not a four-cent pie but two two-cent cones. These privileged children advanced proudly with one cone in their right hand and one in their left; and expertly moving their head from side to side, they licked first one, then the other. This liturgy seemed to me so sumptuously enviable, that many times I asked to be allowed to celebrate it. In vain. My elders were inflexible: a four-cent ice, yes; but two two-cent ones, absolutely no.

As anyone can see, neither mathematics nor economy nor dietetics justified this refusal. Nor did hygiene, assuming that in due course the tips of both cones were discarded. The pathetic, and obviously mendacious, justification was that a boy concerned with turning his eyes from one cone to the other was more inclined to stumble over stones, steps, or cracks in the pavement. I dimly sensed that there was another secret justification, cruelly pedagogical, but I was unable to grasp it.

Today, citizen and victim of a consumer society, a civilization of excess and waste (which the society of the thirties was not), I realize that those dear and now departed elders were right. Two two-cent cones instead of one at four cents did not signify squandering, economically speaking, but symbolically they surely did. It was for this precise reason, that I yearned for them: because two ice creams suggested excess. And this was precisely why they were denied to me: because they looked indecent, an insult to poverty, a display of fictitious privilege, a boast of wealth. Only spoiled children ate two cones at once, those children who in fairy tales were rightly punished, as Pinocchio was when he rejected the skin and the stalk. And parents

who encouraged this weakness, appropriate to little parvenus, were bringing up their children in the foolish theatre of "I'd like to but I can't." They were preparing them to turn up at tourist-class check-in with a fake Gucci bag bought from a street peddler on the beach at Rimini.

Nowadays the moralist risks seeming at odds with morality, in a world where the consumer civilization now wants even adults to be spoiled, and promises them always something more, from the wristwatch in the box of detergent to the bonus bangle sheathed, with the magazine it accompanies, in a plastic envelope. Like the parents of those ambidextrous gluttons I so envied, the consumer civilization pretends to give more, but actually gives, for four cents, what is worth four cents. You will throwaway the old transistor radio to purchase the new one, that boasts an alarm clock as well, but some inexplicable defect in the mechanism will guarantee that the radio lasts only a year. The new cheap car will have leather seats, double side mirrors adjustable from inside, and a panelled dashboard, but it will not last nearly so long as the glorious old Fiat 500, which, even when it broke down, could be started again with a kick.

The morality of the old days made Spartans of us all, while today's morality wants all of us to be Sybarites.

71. Which of the following cannot be inferred from the passage?
    (1) Today's society is more extravagant than the society of the 1930s.
    (2) The act of eating two ice cream cones is akin to a ceremonial process.
    (3) Elders rightly suggested that a boy turning eyes from one cone to the other was more likely to fall.
    (4) Despite seeming to promise more, the consumer civilization gives away exactly what the thing is worth.
    (5) The consumer civilization attempts to spoil children and adults alike.

72. In the passage, the phrase "little parvenus" refers to
    (1) naughty midgets.   (2) old hags.   (3) arrogant people.
    (4) young upstarts.   (5) foolish kids.

73. The author pined for two two-cent cones instead of one four-cent pie because
    (1) it made dietetic sense.
    (2) it suggested intemperance.
    (3) it was more fun.
    (4) it had a visual appeal.
    (5) he was a glutton.

74. What does the author mean by "nowadays the moralist risks seeming at odds with morality"?
    (1) The moralists of yesterday have become immoral today.
    (2) The concept of morality has changed over the years.
    (3) Consumerism is amoral.
    (4) The risks associated with immorality have gone up.
    (5) The purist's view of morality is fast becoming popular.

75. According to the author, the justification for refusal to let him eat two cones was plausibly
    (1) didactic.   (2) dietetic.   (3) dialectic.   (4) diatonic.   (5) diastolic.

Directions for Questions 76 to 80: The passage given below is followed by a set of five questions. Choose the **most appropriate** answer to each question.

Language is not a cultural artifact that we learn the *way* we learn to tell time or how the federal government works. Instead, it is a distinct piece of the biological makeup of our brains. Language is a complex, specialized skill, which develops in the child spontaneously, without conscious effort or formal instruction, is deployed without awareness of its underlying logic, is qualitatively the same in every individual, and is distinct from more general abilities to process information or behave intelligently. For these reasons some cognitive scientists have described language as a psychological faculty, a mental organ, a neural system, and a computational module. But I prefer the admittedly quaint term "instinct". It conveys the idea that people know how to talk in more or less the sense that spiders know how to spin webs. Web-spinning was not invented by some unsung spider genius and does not depend on having had the right education or on having an aptitude for architecture or the construction trades. Rather, spiders spin spider webs because they have spider brains, which give them the urge to spin and the competence to succeed. Although there are differences between webs and words, I will encourage you to see language in this way, for it helps to make sense of the phenomena we will explore.

Thinking of language as an instinct inverts the popular wisdom, especially as it has been passed down in the canon of the humanities and social sciences. Language is no more a cultural invention than is upright posture. It is not a manifestation of a general capacity to use symbols: a three-year-old, we shall see, is a grammatical genius, but is quite incompetent at the visual arts, religious iconography, traffic signs, and the other staples of the semiotics curriculum. Though language is a magnificent ability unique to *Homo sapiens* among living species, it does not call for sequestering the study of humans from the domain of biology, for a magnificent ability unique to a particular living species is far from unique in the animal kingdom. Some kinds of bats home in on flying insects using Doppler sonar. Some kinds of migratory birds navigate thousands of miles by calibrating the positions of the constellations against the time of day and year. In nature's talent show, we are simply a species of primate with our own act, a knack for communicating information about who did what to whom by modulating the sounds we make when we exhale.

Once you begin to look at language not as the ineffable essence of human uniqueness hut as a biological adaptation to communicate information, it is no longer as tempting to see language as an insidious shaper of thought, and, we shall see, it is not. Moreover, seeing language as one of nature's engineering marvels — an organ with "that perfection of structure and co-adaptation which justly excites our admiration," in Darwin's words - gives us a new respect for your ordinary Joe and the much-maligned English language (or any language). The complexity of language, from the scientist's point of view, is part of our biological birthright; it is not something that parents teach their children or something that must be elaborated in school — as Oscar Wilde said, "Education is an admirable thing, but it is well to remember from time to time that nothing that is worth knowing can be taught." A preschooler's tacit knowledge of grammar is more sophisticated than the thickest style manual or the most state-of-the-art computer language system, and the same applies to all healthy human beings, even the notorious syntaxfracturing professional athlete and the, you know, like, inarticulate teenage skateboarder. Finally, since language is the product of a well-engineered biological instinct, we shall see that it is not the nutty barrel of monkeys that entertainer-columnists make it out to be.

76. According to the passage, which of the following does not stem from popular wisdom on language?
    (1) Language is a cultural artifact.
    (2) Language is a cultural invention.
    (3) Language is learnt as we grow.
    (4) Language is unique to *Homo sapiens.*
    (5) Language is a psychological faculty.

77. Which of the following can be used to replace the "spiders know how to spin webs" analogy as used by the author?
    (1) A kitten learning to jump over a wall
    (2) Bees collecting nectar
    (3) A donkey carrying a load
    (4) A horse running a Derby
    (5) A pet clog protecting its owner's property

78. According to the passage, which of the following is unique to human beings?
    (1) Ability to use symbols while communicating with one another.
    (2) Ability to communicate with each other through voice modulation.
    (3) Ability to communicate information to other members of the species.
    (4) Ability to use sound as means of communication.
    (5) All of the above.

79. According to the passage, complexity of language cannot be taught by parents or at school to children because
    (1) children instinctively know language.
    (2) children learn the language on their own.
    (3) language is not amenable to teaching.
    (4) children know language better than their teachers or parents.
    (5) children are born with the knowledge of semiotics.

80. Which of the following best summarizes the passage?
    (1) Language is unique to *Homo sapiens.*
    (2) Language is neither learnt nor taught.
    (3) Language is not a cultural invention or artifact as it is made out.
    (4) Language is instinctive ability of human beings.
    (5) Language is use of symbols unique to human beings.

To summarize the Classic Maya collapse, we can tentatively identify five strands. I acknowledge, however, that Maya archaeologists still disagree vigorously among themselves in part, because the different strands evidently varied in importance among different parts of the Maya realm; because detailed archaeological studies are available for only some Maya sites; and because it remains puzzling why most of the Maya heartland remained nearly empty of population and failed to recover after the collapse and after re-growth of forests.

With those caveats, it appears to me that one strand consisted of population growth outstripping available resources: a dilemma similar to the one foreseen by Thomas Malthus in 1798 and being played out today in Rwanda, Haiti and elsewhere. As the archaeologist David Webster succinctly puts it, "Too many farmers grew too many crops on too much of landscape." Compounding that mismatch between population and resources was the second strand: the effects of deforestation and hillside erosion, which caused a decrease in the amount of useable farmland at a time when more rather than less farmland was needed, and possibly exacerbated by an anthropogenic drought resulting from deforestation, by soil nutrient depletion and other soil problems, and by the struggle to prevent bracken ferns from overrunning the fields.

The third strand consisted of increased fighting, as more and more people fought over fewer resources. Maya warfare, already endemic, peaked just before the collapse. That is not surprising when one reflects that at least five million people, perhaps many more, were crammed into an area smaller than the US state of Colorado (104,000 square miles). That warfare would have decreased further the amount of land available for agriculture, by creating no-man's lands between principalities where it was now unsafe to farm. Bringing matters to a head was the strand of climate change. The drought at the time of the Classic collapse was not the first drought that the Maya had lived through, but it was the most severe. At the time of previous droughts, there were still uninhabited parts of the Maya landscape, and people at a site affected by drought could save themselves by moving to another site. However, by the time of the Classic collapse the landscape was now full, there was no useful unoccupied land in the vicinity on which to begin anew, and the whole population could not be accommodated in the few areas that continued to have reliable water supplies.

As our fifth strand, we have to wonder why the kings and nobles failed to recognize and solve these seemingly obvious problems undermining their society. Their attention was evidently focused on their short-term concerns of enriching themselves, waging wars, erecting monuments, competing with each other, and extracting enough food from the peasants to support all those activities. Like most leaders throughout human history, the Maya kings and nobles did not heed long-term problems, insofar as they perceived them.

Finally, while we still have some other past societies to consider before we switch our attention to the modern world, we must already he struck by some parallels between the Maya and the past societies. As on Mangareva, the Maya environmental and population problems led to increasing warfare and civil strife. Similarly, on Easter Island and at Chaco Canyon, the Maya peak population numbers were followed swiftly by political and social collapse. Paralleling the eventual extension of agriculture from Easter Island's coastal lowlands to its uplands, and from the Mimbres floodplain to the hills, Copan's inhabitants also

expanded from the floodplain to the more fragile hill slopes, leaving them with a larger population to feed when the agricultural boom in the hills went bust. Like Easter Island chiefs erecting ever larger statues, eventually crowned by pukao, and like Anasazi elite treating themselves to necklaces of 2,000 turquoise beads, Maya kings sought to outdo each other with more and more impressive temples, covered with thicker and thicker plaster — reminiscent in turn of the extravagant conspicuous consumption by modern American CEOs. The passivity of Easter chiefs and Maya kings in the face of the real big threats to their societies completes our list of disquieting parallels.

81. According to the passage, which of the following best represents the factor that has been cited by the author in the context of Rwanda and Haiti?
    (1) Various ethnic groups competing for land and other resources
    (2) Various ethnic groups competing for limited land resources
    (3) Various ethnic groups fighting with each other
    (4) Various ethnic groups competing for political power
    (5) Various ethnic groups fighting for their identity

82. By an anthropogenic drought, the author means
    (1) a drought caused by lack of rains.
    (2) a drought caused due to deforestation.
    (3) a drought caused by failure to prevent bracken ferns from overrunning the fields.
    (4) a drought caused by actions of human beings.
    (5) a drought caused by climate changes.

83. According to the passage, the drought at the time of Maya collapse had a different impact compared to the droughts earlier because
    (1) the Maya kings continued to be extravagant when common people were suffering.
    (2) it happened at the time of collapse of leadership among Mayas.
    (3) it happened when the Maya population had occupied all available land suited for agriculture.
    (4) it was followed by internecine warfare among Mayans.
    (5) irreversible environmental degradation led to this drought.

84. According to the author, why is it difficult to explain the reasons for Maya collapse?
    (1) Copan inhabitants destroyed all records of that period.
    (2) The constant deforestation and hillside erosion have wiped out all traces of the Maya kingdom.
    (3) Archaeological sites of Mayas do not provide any consistent evidence.
    (4) It has not been possible to ascertain which of the factors best explains as to why the Maya civilization collapsed.
    (5) At least five million people were crammed into a small area.

85. Which factor has not been cited as one of the factors causing the collapse of Maya society?
    (1) Environmental degradation due to excess population
    (2) Social collapse due to excess population
    (3) Increased warfare among Maya people
    (4) Climate change
    (5) Obsession of Maya population with their own short-term concerns

A remarkable aspect of art of the present century is the range of concepts and ideologies which it embodies. It is almost tempting to see a pattern emerging within the art field - or alternatively imposed upon it a *posteriori* - similar to that which exists under the umbrella of science where the general term covers a whole range of separate, though interconnecting, activities. Any parallelism is however - in this instance at least - misleading. A scientific discipline develops systematically once its bare tenets have been established, named and categorized as conventions. Many of the concepts of modern art, by contrast, have resulted from the almost accidental meetings of groups of talented individuals at certain times and certain places. The ideas generated by these chance meetings had twofold consequences. Firstly, a corpus of work would be produced which, in great part, remains as a concrete record of the events. Secondly, the ideas would themselves be disseminated through many different channels of communication - seeds that often bore fruit in contexts far removed from their generation. Not all movements were exclusively concerned with innovation. Surrealism, for instance, claimed to embody a kind of insight which can be present in the art of any period. This claim has been generally accepted so that a sixteenth century painting by Spranger or a mysterious photograph by Atget can legitimately be discussed in surrealist terms. Briefly, then, the concepts of modern art are of many different (often fundamentally different) kinds and resulted from the exposures of painters, sculptors and thinkers to the more complex phenomena of the twentieth century, including our ever increasing knowledge of the thought and products of earlier centuries. Different groups of artists would collaborate in trying to make sense of a rapidly changing world of visual and spiritual experience. We should hardly be surprised if no one group succeeded completely, but achievements, though relative, have been considerable. Landmarks have been established - concrete statements of position which give a pattern to a situation which could easily have degenerated into total chaos. Beyond this, new language tools have been created for those who follow - semantic systems which can provide a springboard for further explorations.

The codifying of art is often criticized. Certainly one can understand that artists are wary of being pigeon-holed since they are apt to think of themselves as individuals - sometimes with good reason. The notion of self-expression, however, no longer carries quite the weight it once did; objectivity has its defenders. There is good reason to accept the ideas codified by artists and critics, over the past sixty years or so, as having attained the status of independent existence - an independence which is not without its own value. The time factor is important here. As an art movement slips into temporal perspective, it ceases to be a living organism - becoming, rather, a fossil. This is not to say that it becomes useless or uninteresting. Just as a scientist can reconstruct the life of a prehistoric environment from the messages codified into the structure of a fossil, so can an artist decipher whole webs of intellectual and creative possibility from the recorded structure of a 'dead' art movement. The artist can match the creative patterns crystallized into this structure against the potentials and possibilities of his own time. As T.S. Eliot observed, no one starts anything from scratch; however consciously you may try to live in the present, you are still involved with a nexus of behaviour patterns bequeathed from the past. The original and creative person is not someone who ignores these patterns, but someone who is able to translate and develop them so that they conform more exactly to his - and our - present needs.

86. Many of the concepts of modern art have been the product of
    (1) ideas generated from planned deliberations between artists, painters and thinkers.
    (2) the dissemination of ideas through the state and its organizations.
    (3) accidental interactions among people blessed with creative muse.
    (4) patronage by the rich and powerful that supported art.
    (5) systematic investigation, codification and conventions.

87. In the passage, the word 'fossil' can be interpreted as
    (1) an art movement that has ceased to remain interesting or useful.
    (2) an analogy from the physical world to indicate a historic art movement.
    (3) an analogy from the physical world to indicate the barrenness of artistic creations in the past.
    (4) an embedded codification of pre-historic life.
    (5) an analogy from the physical world to indicate the passing of an era associated with an art movement.

88. In the passage, which of the following similarities between science and art may lead to erroneous conclusions?
    (1) Both, in general, include a gamut of distinct but interconnecting activities.
    (2) Both have movements not necessarily concerned with innovation.
    (3) Both depend on collaborations between talented individuals.
    (4) Both involve abstract thought and dissemination of ideas.
    (5) Both reflect complex priorities of the modern world.

89. The range of concepts and ideologies embodied in the art of the twentieth century is explained by
    (1) the existence of movements such as surrealism.
    (2) landmarks which give a pattern to the art history of the twentieth century.
    (3) new language tools which can be used for further explorations into new areas.
    (4) the fast changing world of perceptual and transcendental understanding.
    (5) the quick exchange of ideas and concepts enabled by efficient technology.

90. The passage uses an observation by T.S. Eliot to imply that
    (1) creative processes are not 'original' because they always borrow from the past.
    (2) we always carry forward the legacy of the past.
    (3) past behaviours and thought processes recreate themselves in the present and get labeled as 'original' or 'creative'.
    (4) 'originality' can only thrive in a 'greenhouse' insulated from the past biases.
    (5) 'innovations' and 'original thinking' interpret and develop on past thoughts to suit contemporary needs.

Answers and Explanations

1	3	**2**	3	**3**	2	**4**	2	**5**	2	**6**	5	**7**	3	**8**	4	**9**	4	**10**	1
11	2	**12**	5	**13**	5	**14**	3	**15**	5	**16**	1	**17**	4	**18**	3	**19**	4	**20**	4
21	5	**22**	2	**23**	1	**24**	1	**25**	1	**26**	4	**27**	5	**28**	2	**29**	5	**30**	3
31	4	**32**	2	**33**	3	**34**	3	**35**	2	**36**	4	**37**	5	**38**	5	**39**	1	**40**	1
41	4	**42**	3	**43**	5	**44**	5	**45**	1	**46**	1	**47**	1,4	**48**	3	**49**	3	**50**	2
51	1	**52**	4	**53**	3	**54**	1	**55**	3	**56**	2	**57**	2	**58**	1	**59**	3	**60**	4
61	2	**62**	5	**63**	3	**64**	4	**65**	2	**66**	4	**67**	2	**68**	4	**69**	2	**70**	5
71	3	**72**	4	**73**	2	**74**	2	**75**	1	**76**	5	**77**	2	**78**	2	**79**	1	**80**	4
81	1	**82**	4	**83**	3	**84**	4	**85**	5	**86**	3	**87**	5	**88**	1	**89**	4	**90**	5

MY PERFORMANCE							
		Total Questions	Time Taken (Min)	Total Attempts	Correct Attempts	Incorrect Attempts	Net Score
Quantitative Ability	Section I	25					
Data Interpretation and Reasoning	Section II	25					
Language Comprehension and English Usage	Section III	40					
TOTAL		**90**	**150**				

Disclaimer: There are mismatches in our VA Answer key (Question nos. 54, 60, 66, 67 & 69) with the solutions that IIMs have provided. However, all these questions are quite controversial and Career Launcher stands by its answer key as we have debated, discussed and 'googled' it time and again.

1. 3 Total sum of the numbers written on the blackboard

$= \dfrac{40 \times 41}{2} = 820$

When two numbers 'a' and 'b' are erased and replaced by a new number a + b − 1, the total sum of the numbers written on the blackboard is reduced by 1. Since, this operation is repeated 39 times, therefore, the total sum of the numbers will be reduced by 1 × 39 = 39.

Therefore, after 39 operations there will be only 1 number that will be left on the blackboard and that will be 820 − 39 = 781.

2. 3 The last two digits of any number in the form of 7^{4n} will always be equal to 01.
For example: $7^4 = 2401$ and $7^8 = 5764801$.

3. 2 $x^3 - ax^2 + bx - c = 0$
Let the roots of the above cubic equation be $(\alpha - 1),\ \alpha,\ (\alpha + 1)$
$\Rightarrow \alpha(\alpha - 1) + \alpha(\alpha + 1) + (\alpha + 1)(\alpha - 1) = b$
$\Rightarrow \alpha^2 - + \alpha^2 + \alpha + \alpha^2 - 1 = b \Rightarrow 3\alpha^2 - 1 = b$

Thus, the minimum possible value of 'b' will be equal to − 1 and this value is attained at $\alpha = 0$.

4. 2 Amount of rice bought by the first customer

$= \left(\dfrac{x}{2} + \dfrac{1}{2}\right)$ kgs

Amount of rice remaining $= x - \left(\dfrac{x}{2} + \dfrac{1}{2}\right) = \dfrac{x-1}{2}$ kgs

Amount of rice bought by the second customer

$= \dfrac{1}{2} \times \left(\dfrac{x-1}{2}\right) + \dfrac{1}{2} = \dfrac{x+1}{4}$ kgs

Amount of rice remaining

$= \left(\dfrac{x-1}{2}\right) - \left(\dfrac{x+1}{4}\right) = \dfrac{x-3}{4}$ kgs

Amount of rice bought by the third customer

$= \dfrac{1}{2} \times \left(\dfrac{x-3}{4}\right) + \dfrac{1}{2} = \dfrac{x+1}{8}$ kgs

As per the information given in the question

$\dfrac{x+1}{8} = \dfrac{x-3}{4}$ because there is no rice left after the third customer has bought the rice.
Therefore, the value of 'x' = 7 kgs.

5. 2 Given that $f(x) = ax^2 + bx + c$
Also, $f(5) = -3f(2) \Rightarrow f(5) + 3f(2) = 0$
$\Rightarrow (25a + 5b + c) + 3(4a + 2b + c) = 0$
$\Rightarrow 37a + 11b + 4c = 0$ ...(i)
Also, as 3 is a root of f(x) = 0, thus, f(3) = 0.
Therefore, 9a + 3b + c = 0 ...(ii)
Using equation (i) and (ii), we get that a = b

Therefore, c = −12a
$\Rightarrow f(x) = a(x^2 + x - 12) = a(x + 4)(x - 3)$
Therefore, the other root of f(x) = 0 is −4.

6. 5 $f(x) = a(x^2 + x - 12)$
Therefore, the value of a + b + c cannot be uniquely determined.

7. 3 Total number of terms in the sequence 17, 21, 25 …

417 is equal to $\dfrac{417 - 17}{4} + 1 = 101$.

Total number of terms in the sequence 16, 21, 26 …

466 is equal to $\dfrac{466 - 16}{5} + 1 = 91$.

n^{th} term of the first sequence = 4n + 13.
m^{th} term of the second sequence = 5m + 11.
As per the information given in the question 4n + 13 = 5m + 11
$\Rightarrow 5m - 4n = 2$.
Possible integral values of n that satisfy 5m = 2 + 4n are (2, 7, 12 … 97)
Therefore, the total number of terms common in both the sequences is 20.

8. 4 In other words we need to find the total number of 4-digit numbers not more than 4000 using the digits 0, 1, 2, 3 and 4.
The digit at the thousands place can be selected in 3 ways.
The digits at the hundreds place can be selected in 5 ways.
The digits at the tens place can be selected in 5 ways.
The digits at the units place can be selected in 5 ways.
Therefore, the total number of 4-digit numbers less than 4000 is equal to
3 × 5 × 5 × 5 = 375.
Therefore, the total number of 4-digit numbers not more than 4000 is equal to 375 + 1 = 376.

9. 4
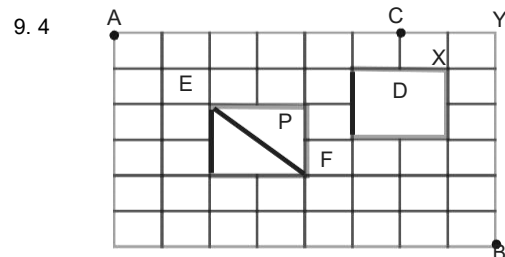
For the shortest route, Neelam follows the following path:

$A \rightarrow E \rightarrow F \rightarrow B$

No. of ways to reach from A to E: $\dfrac{(2+2)!}{2! \times 2!} = 6$

No. of ways to reach from E to F: 1

No. of ways to reach from F to B: $\dfrac{(4+2)!}{4! \times 2!} - 15$

⇒ Total number of possible shortest paths
= 6 × 1 × 15 = 90

10. 1   Neelam has to reach C via B.
From A to B, the number of paths are 90, as found in question 9.
From B to C, Neelam follows the route:

Case I: $B \to X \to C$

OR **Case II:** $B \to Y \to C$.

Case I: $B \to X \to C$

No. of ways to reach from B to X: $\dfrac{(5+1)!}{5! \times 1!} = 6$

No. of ways to reach from X to C : 2
So, total number of paths are 6 × 2 = 12 ways.

Case II: $B \to Y \to C$ **:**
There is just one way.
Therefore, from B to C, there are 6 × 2 + 1 = 13 ways
∴ Total number of ways of reaching from A to C, via B = 90 × 13 = 1170.

11. 2 $f(x).f(y) = f(xy)$
Given, f(2) = 4
We can also write,
f(2) = f(2 × 1) = f(2) × f(1)
OR f(1) × 4 = 4
⇒ f(1) = 1
Now we can also write,
$f(1) = f\left(2 \times \dfrac{1}{2}\right) = f(2) \times f\left(\dfrac{1}{2}\right)$

$\Rightarrow f\left(\dfrac{1}{2}\right) = \dfrac{f(1)}{f(2)} = \dfrac{1}{4}$

12. 5   seed(n) function will eventually give the digit-sum of any given number, n.
All the numbers 'n' for which seed(n) = 9 will give the remainder 0 when divided by 9.
For all positive integers n, n < 500, there are 55 multiples of 9.

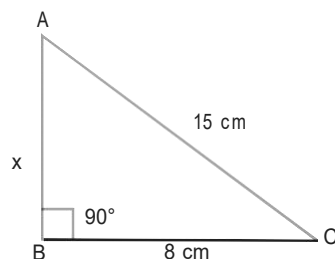13. 5   We can use the formula for the circum radius of a triangle:

$R = \dfrac{a \times b \times c}{4 \times (\text{Area of the triangle})}$

or $R = \dfrac{a \times b \times c}{4 \times \left(\dfrac{1}{2} \times b \times AD\right)} = \dfrac{a \times c}{2 \times AD}$

$= \dfrac{17.5 \times 9}{2 \times 3} = 26.25$ cm

14. 3   The three sides of the obtuse triangle are 8 cm, 15 cm and x cm. As 15 is greater than 8, hence either x or 15 will be the largest side of this triangle. Consider two cases:
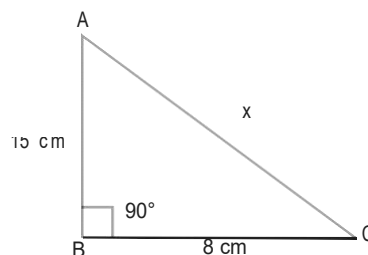
Case I:

Consider the right ΔABC above,

$x = \sqrt{15^2 - 8^2} = 12.68$ cm

For all values of x < 12.68, the ΔABC will be obtuse. But as the sum of two sides of triangle must be greater than the third side, hence (x + 8) > 15 or x > 7.
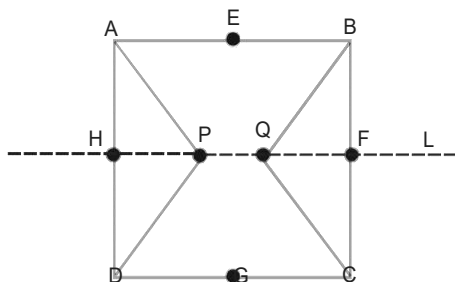Thus, the permissible values of x are 8, 9, 10, 11 and 12.

Case II:

In the right ΔABC above, $x = \sqrt{15^2 + 8^2} = 17$.

For all values of x > 17, ΔABC will be obtuse. But, as the length of third side should be less than the sum of other two sides, hence x < (15 + 8) or x < 23. The permissible values of x are: 18, 19, 20, 21 and 22.
From Case I and II, x can take 10 values.

15. 5

Let, the length of AH = 'x' cm

By symmetry of the figure given above, we can conclude that $\triangle APD$ and $\triangle BQC$ will have the same area.

$\angle APD$ is 120° and line 'L' divides the square ABCD in 2 equal halves, therefore

$\angle APH = \angle HPD = 60°$

In $\triangle AHP$: $\dfrac{AH}{HP} = \tan 60° = \sqrt{3} \Rightarrow HP = \dfrac{x}{\sqrt{3}}$ cm

Area of $\triangle APD = 2 \times$ area$(\triangle AHP)$

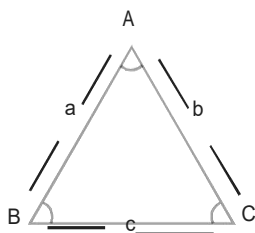$= 2 \times \dfrac{1}{2} \times x \times \dfrac{x}{\sqrt{3}} = \dfrac{x^2}{\sqrt{3}}$ cm

Area of ABQCDP = area (ABCD) – 2 area ($\triangle APD$)

$$= 4x^2 - \dfrac{2x^2}{\sqrt{3}} = \dfrac{2x^2\left(2\sqrt{3}-1\right)}{\sqrt{3}}$$

Required Ratio $= \dfrac{\dfrac{2x^2\left(2\sqrt{3}-1\right)}{\sqrt{3}}}{\dfrac{2x^2}{\sqrt{3}}} = 2\sqrt{3}-1$
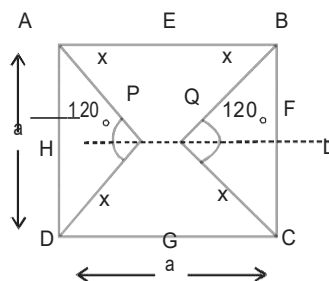
Alternate method:

Concepts used:

$\Rightarrow \dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

Also, area of $\triangle ABC = \dfrac{1}{2} ab \sin C$

$= \dfrac{1}{2} bc \sin A = \dfrac{1}{2} ac \sin B$

In the given figure

For $\triangle APD$, Let AP = PD = x cms

$\Rightarrow \dfrac{a}{\sin 120°} = \dfrac{x}{\sin 30°} = \dfrac{x}{\sin 30°}$

$\Rightarrow \sin 120° = \sin(90 + 30) = \cos 30 = \dfrac{\sqrt{3}}{2}$, $\sin 30 = \dfrac{1}{2}$

$\Rightarrow \dfrac{a}{\dfrac{\sqrt{3}}{2}} = \dfrac{x}{\dfrac{1}{2}} \Rightarrow x = \dfrac{a}{\sqrt{3}}$ cms

Thus, area of $\triangle APD$ is $\dfrac{1}{2} \times AP \times PD \times \sin 120°$

$= \dfrac{1}{2} \times \dfrac{a}{\sqrt{3}} \times \dfrac{a}{\sqrt{3}} \times \dfrac{\sqrt{3}}{2} = \dfrac{a^2}{4\sqrt{3}}$ cm²

by symmetry, Area of $\triangle APD$ = Area of $\triangle BQC$

Thus, ratio of $\dfrac{\text{Area of ABQCDP}}{\text{[Removing area inside square ABCD}}$

$= \dfrac{\text{Area of square ABCD} - 2 \times (\text{Area of } \triangle APD)}{2 \times (\text{Area of } \triangle APD)}$

$= 2\sqrt{3}-1$

16. 1 Number of terms in the given expansion is nothing but the non-negative integral solutions of the equation $a + b + c = 20$.

Total number of non-negative integral solutions

$$= {}^{20+3-1}C_{3-1} = {}^{22}C_2 = 231$$

Alternative Method:

$$(a + b + c)^{20} = \{(a + b) + c\}^{20}$$

$$= {}^{20}C_0(a+b)^{20}.C^0 + {}^{20}C_1(a+b)^{19}.C^1 + ... {}^{20}C_{20}(a+b)^0.C^{20}$$

Number of terms = 21 + 20 + 19 + ... + 1 = 231

For questions 17 to 18:

Raju bets on the horses as follows:

Red – Rs.3000 , White – Rs.2000 and Black – Rs.1000 = Total of

Rs.6000

He makes no profit no loss in the game. So the possible ways of recovering his money (Rs.6000) is as follows:

Case (i): 3000 + 3(1000)

Case (ii): 2000 + 4(1000)

Case (iii): 3(2000) + 0

Case (a): A breakup of 3000 + 3(1000) can be arrived at if the Black horse finished at 2nd and the Red horse at 3rd positions.

Then the White horse is either on the 4th or 5th position.

	1st	2nd	3rd	4th	5th
I	Grey/Spotted	Black	Red	White	Spotted/Grey
II	Grey/Spotted	Black	Red	Spotted/Grey	White

Case (b): A breakup of 2000 + 4(1000) can be arrived at if the Black horse finished at 1st and the White horse at 3rd positions.
Then the Red horse is either on the 4th or 5th position.

	1st	2nd	3rd	4th	5th
I	Black	Grey/Spotted	White	Red	Spotted/Grey
II	Black	Grey/Spotted	White	Spotted/Grey	Red

Case (c): A breakup of 3(2000) + 0 can be arrived at if the White horse finished at 2nd position.

Then the Red and Black horses must have finished at the 4th and 5th positions, not necessary in that order.

	1st	2nd	3rd	4th	5th
I	Spotted/Grey	White	Grey/Spotted	Red/Black	Black/Red

17. 4 None of the cases has three horses between White and Red horses.

18. 3 If Grey came fourth, we consider cases (a) and (b). All the options except (c) can hold true for these cases. White horse can either be 2nd or 5th in the race.

19. 4 Statement A: If the number of players at the entry level is 83, we can get the following table.

Round	Number of players	Pair of players	Byes	Number of matches
1	83	41	1	41
2	41 + 1 = 42	21	0	21
3	21	10	1	10
4	10 + 1 = 11	5	1	5
5	5 + 1 = 6	3	0	3
6	3	1	1	1
7	1 + 1 = 2	1	0	1

Since we do not know the number of byes given to the champion, we cannot ascertain the number of matches played by him.
Hence, statement A alone is not sufficient.
Statement B: The champion received one bye, but no information is given regarding the number of entrants in the tournament.
Hence, statement B alone is not sufficient.

Combining statements A and B, we get that the total number of matches played by the champion = 7 - 1 = 6
Hence, statements A and B both are required to answer.

20. 4 Using statement A:
When n = 127, exactly one bye is given in round 1.
When = 96, exactly one bye is given in round 6.
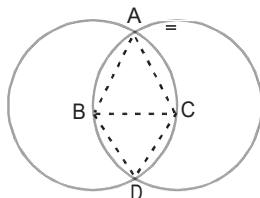As no unique value of n can be determined, hence, statement A alone is not sufficient.

Using statement B:
As we do not know exactly how many bye 5 are given in total, we cannot determine the value of n, uniquely.

Combining statement A and B:
There is a unique value of n = 124, for which exactly 1 bye is given from the third round to the fourth round.

21. 5

It is given that AB = BC = AC = BD = DC = 1 cm.

Therefore, $\triangle ABC$ is an equilateral triangle.

Hence, $\angle ACB = 60°$

Now area of sector $\overset{\frown}{AB} = \dfrac{60}{360} \times \pi(1)^2 = \dfrac{\pi}{6}$

Area of equilateral triangle $\triangle ABC = \dfrac{\sqrt{3}}{4}(1)^2 = \dfrac{\sqrt{3}}{4}$

Area of remaining portion in the common region
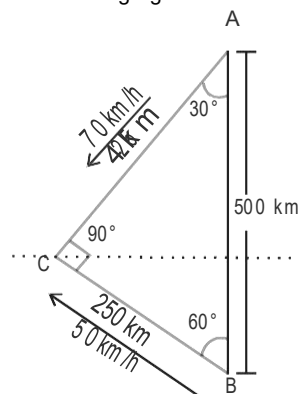
$\overset{\frown}{ABC}$ excluding ABC

$= 2 \times \left(\dfrac{\pi}{6} - \dfrac{\sqrt{3}}{4} \right)$

Hence, the total area of the intersecting region =

$2 \times \dfrac{\sqrt{3}}{4} \times (1)^2 + 4 \times \left(\dfrac{\pi}{6} - \dfrac{\sqrt{3}}{4} \right)$

$= \dfrac{2\pi}{3} - \dfrac{\sqrt{3}}{2}$ sq. cm.

22. 2 As per the conditions given in the questions, we get the following figure.

The train leaving at B reaches C at 1:00 p.m. taking a total time of 5 hours, which means that Rahim should reach C by 12:45 p.m.

Now total time taken by Rahim moving with a speed of 70 km/hr is 't'.

$t = \dfrac{250\sqrt{3}}{70}$ km/hr = 6 hrs 12 mins (approx)

The time by which Rahim must start from A
= 13 : 00 − 0 : 15 − 6 : 12 = 6 : 33
Therefore, the latest time by which Rahim must leave A and still catch the train is closest to 6:30 a.m.

23. 1 Let the three consecutive positive integers be equal to 'n − 1', 'n' and 'n + 1'.

$\Rightarrow n - 1 + n^2 + (n+1)^3 = (3n)^2$

$\Rightarrow n^3 + 4n^2 + 4n = 9n^2$

$\Rightarrow n^2 - 5n + 4 = 0$

$\therefore n = 1$ or $n = 4$

Since, the three integers are positive, the value of 'n' cannot be equal to 1, therefore the value of 'n' = 4 or m = n − 1 = 3.
Hence, the three consecutive positive integers are 3, 4 and 5.

24. 1

$S = \sqrt{1 + \dfrac{1}{1^2} + \dfrac{1}{2^2}} + \sqrt{1 + \dfrac{1}{2^2} + \dfrac{1}{3^2}} + ... + \sqrt{1 + \dfrac{1}{2007^2} + \dfrac{1}{2008^2}}$
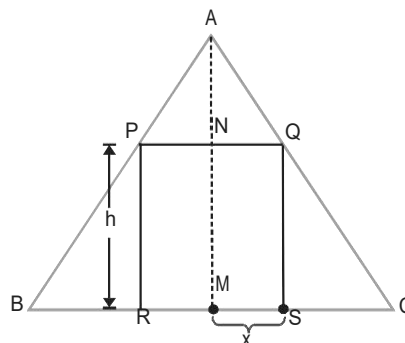
$T_n = \sqrt{1 + \dfrac{1}{n^2} + \dfrac{1}{(n+1)^2}}$

$= \sqrt{\dfrac{n^4 + 2n^3 + 3n^2 + 2n + 1}{n^2(n+1)^2}}$

$= \dfrac{n^2 + n + 1}{n^2 + n} = 1 + \dfrac{1}{n^2 + n}$

$S = \sum_{n=1}^{2007} T_n = 2007 + \sum_{n=1}^{2007} \left\{ \dfrac{1}{n} - \dfrac{1}{n+1} \right\} = 2008 - \dfrac{1}{2008}$

25. 1

Let, the height of the cylinder be 'h' cm and radius be 'x' cm.

$\triangle ANQ$ is similar to $\triangle QSC$

$$\rightarrow \frac{AN}{NQ} - \frac{QS}{SC} \rightarrow \frac{10-h}{x} - \frac{h}{4-x}$$

$$\Rightarrow \frac{10}{h} - 1 = \frac{x}{4-x} \Rightarrow \frac{10}{h} = \frac{4}{4-x}$$

$$\therefore h = \frac{5}{2}(4-x)$$

Surface area of the cylinder PQSR

$$= 2\pi\left[x^2 + hx\right] = 2\pi\left[x^2 + \frac{5x}{2}(4-x)\right]$$

$$= 2\pi\left[x^2 - \frac{5}{2}x^2 + 10x\right] = 2\pi\left[10x - \frac{3}{2}x^2\right]$$

$$= 2\pi\left[-\frac{3}{2}\left(x - \frac{10}{3}\right)^2 + \frac{50}{3}\right]$$
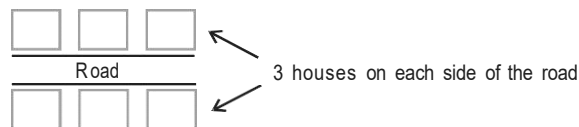
Maximum value of surface area of the cylinder will

be at $x = \frac{10}{3}$.

For questions 26 to 28:
The given information can be depicted as follows.
(i)

Road

3 houses on each side of the road

(ii)   Six houses – P, Q, R, S, T, U

(iii)   Colours – Red, Blue, Green, Orange, Yellow, White
(iv)   Different heights
(v)   T = tallest & opposite to Red
(vi)   Shortest opposite to Green
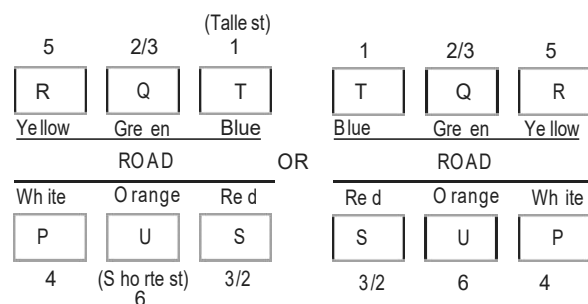(vii)   U = orange & the position of U is: P/S U S/P
(viii)   R = yellow & opposite to P
(ix)   Q = Green & opposite to U
(x)   P = White & (S, Q) > P > R (in height)

From (iv), (v), (vi), (ix) & (x), T > (S, Q) > P > R > U in terms of height
From (iv), (vii), (viii), (ix) & (x), we get the following two cases.

26. 4   Diagonally opposite to yellow is red.

27. 5   Second tallest house is either Q or S. So, we can not determine.

28. 2   Tallest house is T whose colour is Blue.

29. 5   Let volume of data transfer in India = Volume of data transfer in Singapore = x

For INDIA:
ARDT for India ≈ $1 (approx)

∴ Revenue from data transfer = $x (approx)

$$\frac{\text{Revenue from data transfer}}{\text{Total Revenue}} \times 100 = 9\% \text{ (approx)}$$

$$\Rightarrow \text{Total Revenue} \simeq \frac{x}{9} \times 100 \text{ (approx)}$$

For SINGAPORE:

ARDT = $9 (approx)

∴ Revenue from data transfer = $9x (approx)

$$\frac{\text{Revenue from data transfer}}{\text{Total Revenue}} \times 100 = 20.5\% \text{ (approx)}$$

$$\Rightarrow \text{Total Revenue} = \frac{9x}{20.5} \times 100 \text{ (approx)}$$

$$\frac{\text{Total Revenue for Singapore}}{\text{Total Revenue for India}} = \frac{\frac{9x}{20.5} \times 100}{\frac{x}{9} \times 100} \approx 4 \text{ (approx)}$$

30. 3   Let total revenue of Sweden in 2010 = x
Therefore total Revenue of India in 2010 = 2x

For Sweden in 2010:

ARDT = $6
Revenue from data transfer = 2 × 18% of x

$$\therefore \text{Volume of data transfer} = \frac{2 \times 18\% \text{ of } x}{6}$$

For India in 2010:

Let ARDT = y
Revenue from data transfer = 3 × 9% of 2x

$$\therefore \text{Volume of data transfer} = \frac{3 \times 9\% \text{ of } 2x}{y}$$

$$\text{Therefore } \frac{2 \times 18\% \text{ of } x}{6} = \frac{3 \times 9\% \text{ of } 2x}{y} \Rightarrow y = \$9$$

Therefore % change in ARDT of India

$$= \frac{9-1}{1} \times 100 = 800\%$$

31. 4 **For UK**:

$$\frac{\text{Revenue from Data transfer}}{\text{Total Revenue}} \times 100 = 30\% \text{ (approx)}$$

$$\text{Revenue from Data transfer} = \frac{30}{100} \times \text{Total Revenue}$$

ARDT = $ 13 (approx)

$$\therefore \text{ Volume of Data transfer} = \frac{30}{100} \times \frac{\text{Total Revenue}}{13}$$

$$\approx \frac{3}{130} \times \text{Total Revenue}$$

For Spain:

$$\frac{\text{Revenue from Data transfer}}{\text{Total Revenue}} \times 100 = 15\% \text{ (approx)}$$

ARDT = 6.5 (approx)

$$\therefore \text{ Volume of Data transfer} = \frac{15}{100} \times \frac{\text{Total Revenue}}{6.5}$$

$$\approx \frac{3}{130} \times \text{Total Revenue}$$

Similarly, we can check the other options and easily see that the volume of data transfer is NOT the same for given pair countries.

32. 2 Since Bhama got calls from all colleges, she has to score marks in each section equal to at least the maximum of the cut-offs across colleges which means 45, 45, 46 & 45 in section A, B, C & D respectively. This makes her total to be 181 with which she will clear the overall cut-offs of all institutes also.

33. 3 Since we have to minimise the marks in a particular section, we will have to maximise the marks in other 3 sections. Let us assume that marks obtained in each of the three sections in which we are going to maximize the score, is equal to 50. Now, the lowest overall cut-off is 171 & second lowest is 175. Hence, Charlie must have scored at least 175 – (50 + 50 + 50) = 25 marks in the remaining section.

Let us confirm whether he can clear sectional cut-offs also with such a distribution. On seeing the sectional cut-offs, we conclude that they can be cleared with 50 marks each in section A, B & C and 25 marks in section D, which may enable Charlie to clear the sectional cut-off of section D for college 1, 2, 3 or 5. Hence, 25 is the correct answer.

34. 3 Since we have to maximize Aditya's marks, let us take the base values of 50 marks in each section and try to reduce that by minimum values to ensure he doesn't get any call. We notice that by reducing the marks obtained in section C to 41, we ensure colleges 1, 2, 3 & 5 are ruled out. Now for colleges 4 & 6, reducing the marks obtained in section D to 43, ensures these colleges are also ruled out. Please note that we are reducing the score to 1 less than the minimum cut-off across all colleges for that particular section.

In the other two sections A and B, Aditya may score 50 each. So the maximum possible aggregate marks = 50 + 50 + 41 + 43 = 184.

For questions 35 to 38:
The given basic information can be collated as below:
(i)   Six teams – A, B, C, D, E, F.
(ii)   Matches scheduled in two stages – I & II.
(ii)   No team plays against the same team more than once.
(iv)   No ties permitted.
As per the instructions given for stage – I, we can reach the following conclusions:
(a)   As B lost at least one match, A won all the 3 matches.
(b)   The two teams who lost all the matches cannot be A (as explained above), cannot be B (E lost to B), cannot be D (D won against C & F). Hence, the two teams must be C and F.
(c)   F did not play against the top team (i.e. A).
We get the following table for stage – I.

(To be read from rows)

	A	B	C	D	E	F
A	X	W	W	W		
B	L	X			W	W
C	L		X	L	L	
D	L		W	X		W
E		L	W		X	W
F		L		L	L	X

As per the instructions given for Stage-II, we can reach the following conclusions.
(d)   A lost both its matches against E and F.
(e)   F won against A, hence is the bottom team (out of C & F) which won both the matches ⇒ F won against C as well.
This also means that C lost both its matches against B and F.
(f)   )   Apart from A and C, one more team lost both the matches in Stage-II.
That team can neither be E (A lost to E), nor B (as C lost to B), nor F (as F won both its matches). Hence, the team must be D.

We get the following table for Stage-II.

(To be read from rows)

	A	B	C	D	E	F
A	X				L	L
B		X	W	W		
C		L	X			L
D		L		X	L	
E	W			W	X	
F	W		W			X

35. 2 E and F defeated A. **[Please note that in this question, options (1) and (5) were the same.]**

36. 4 B, E and F won both the matches in Stage-II.

37. 5 D and F won exactly two matches in the event.

38. 5 B and E have most wins, 4 each.

39. 1 Subscription in Europe in 2006 = 380 Mn USD
Subscription in Europe in 2007 = 500 Mn USD

% change in 2007 $= \dfrac{500 - 380}{380} \times 100 \approx 30\%$

Therefore subscription (based upon the growth rate of 2007 over 2006) in 2008 should have been
= 500 × 1.3 = 650 Mn USD (approx)
Therefore difference from the estimated subscription = 650 – 600 = 50 Mn USD (approx)
[Please note that the unit is mentioned neither in the question, nor in the options]

40. 1 Let the total number of subscribers = 100x
Number of men = 60x
Therefore number of men in 2010 = 60x × (1.05)[7]
= 84.42x (approx)
Number of women = 40x
Therefore, number of women in 2010 = 40x × 1.1[7]
= 77.94x (approx)
Therefore, total number of subscribers = 84.42x + 77.94x
 = 162.36x
Percentage growth of subscribers

$= \dfrac{162.36x - 100x}{100x} = 62.36$ (approx)

41. 4 Gap in 2008 = 780 – 600 = 180 Mn USD
Gap in 2009 = 810 – 700 = 110 Mn USD

Annual % change $= \dfrac{110 - 180}{180} \times 100 = -39\%$

Absolute change = 39% which is the highest.
Among the other options, option (3) '06-07' is closest, but it will lead to only 22% change in gap.

42. 3 Growth rate of 2007 $= \dfrac{500 - 380}{380} \times 100 = 31.58\%$

Growth rate of 2005 $= \dfrac{280 - 190}{190} \times 100 = 47.37\%$

Therefore % change in growth rate of 2007 relative to growth rate of 2005 is

$\dfrac{47.37 - 31.58}{47.37} \times 100 \approx 35\%$

43. 5 Since we do not know what are the share prices during different times of the day we cannot come to any conclusion.

44. 5 Abdul buys all his shares at 10 am while the other two purchases once every hour. Since the share prices throughout the day is not specified, we cannot compare the returns of Abdul with the other two. Let us observe the strategies adopted by Bikram and Chetan.
Bikram buys equal number of shares every one hour, irrespective of their prices.
Chetan invests equal amount every one hour, irrespective of the share prices. This means that higher the share price, lesser the number of shares purchased by him. This in turn reduces his return. So whenever the prices are changing, Chetan's returns will be higher than Bikram's. In case, the share prices remain the same, the returns of Bikram and Chetan will be equal.
Hence, the correct option is (5) – none of the above.

45. 1 As the share prices are increasing throughout the day, the earlier a person invests, the more profitable it would be. Therefore, Abdul who invested in the beginning only, had reaped in the maximum return.
Between Bikram and Chetan, Bikram bought a fixed number of shares every one hour, i.e. towards the end , he must have bought the same number of shares at an even higher rate. Meanwhile, Chetan invested same amount every one hour, i.e. he bought higher number of shares when the prices were low and vice versa. Hence, Chetan's return will be definitely higher than Bikram's.

Additional data for questions 46 to 47:
Let the share prices (in Rs.) at 10 am, 11 am, 12 noon, 1 pm, 2 pm and 3 pm be a, b, c, d, e and f respectively. Abdul purchased all his shares at 10 am and sold off the same at 3 pm. It is given that he incurred a loss. If he bought n shares, then his investment = na must be more than his sale price = nf, i.e. na > nf ⇒ a > f … (i)
Similarly, Emily bought/sold same number of shares at 10 am/12 noon and 1 am/3 pm and finally made profit.
i.e. c + f > a + d   … (ii)
Similar observation for Dane can be made
i.e. d + e + f > a + b + c   … (iii)

It is given that share price at 12 noon is less than the opening price, i.e. $\quad$ a > c

$\cdots$ (iv)

Also, share price at 2 pm is lower than the closing price

i.e. f > e $\qquad\qquad\qquad\qquad$ $\cdots$ (v)

From (i) and (ii), we get c > d $\qquad$ $\cdots$ (vi)

From (i), (iii) and (vi), we get e > b

Hence, we have a > f > e > b and a > c > d.

46. 1   The share price was the highest at 10 am.

47. 1 and 4

Share price was lowest either at 11 am or 1 pm. Therefore, option (a) is false.

Share price at 1 pm was higher than that at 12 noon (equation (vi)).

48. 3   Average gross pay of HR department before transfer

= Rs. 5000 × 1.7 = Rs. 8500

Basic pay of the transferred person = Rs. 8000

New allowance of the transferred person = (80 + 10) = 90% of the basic pay

New Gross pay of the transferred person

= Rs. 8000 × 1.9 = Rs. 15,200

New average gross pay of HR dept.

$$= \text{Rs. } 8500 + \left(\frac{15200 - 8500}{6}\right) = \text{Rs. } (8500 + 1116)$$

$$\text{Percentage change} = \frac{1116}{8500} \times 100 \approx 13\%$$

49. 3   Since increase in average age of the Finance department. is one year, the age of the person moving from Marketing to Finance is more than that moving from Finance to Marketing, by 1 × 20 = 20 years.

Hence, due to this transfer, cumulative age of Marketing department has gone down by 20 yrs. But since the average age of Marketing department remaining unchanged, the person moving from Marketing to HR has age = (Avg. age of Marketing) − 20 = 15 years.

$$\text{New average age of HR dept.} = \frac{(5 \times 45) + (1 \times 15)}{5 + 1}$$

$$= 40 \text{ yrs.}$$

50. 2   Total basic pay of HR

= 5 × 5000 (existing) + 2 × 6000 (from Maintenance) + 1 × 8000 (from Marketing) = Rs. 45,000

$$\text{New average} = \frac{45,000}{8} = \text{Rs. } 5,625$$

$$\text{Percentage change} = \frac{625}{5000} \times 100 = 12.5\%.$$

51. 1   Sentence A is incorrect as the spelling of 'imigrant' is not correct , should be 'immigrant'. Sentence D is incorrect because of a missing article and should be ' the owner of a dry goods ….'. Sentence E is incorrect and should be '….. would later be known as…..'. Sentence C is incorrect. We require a comma between 'brother-in-law' and 'David Stern'.

52. 4   Sentence B should be'….its labour policy' because the subject is Nike and we can't substitute it with the plural pronoun 'their'. Sentence C should be 'Perhaps sensing that the rising tide…' as without 'that' the sentence structure is incomplete. Sentence E should be ' ….an industry..' as the word industry begins with a vowel so the appropriate article is 'an'.

53. 3 Sentence B should be '…few millions…. 'Sentence D should be … reach the hundreds who are marooned.. Sentence E is incorrect as per subject verb agreement and should be '…death count has begun'.

54. 1 Sentence B has tense inconsistency, it should be '…I associated you…'. Sentence C has a similar error and should be '….who seemed…'. Sentence D has an error of modifier placement and should be '…not in the least curious..' Sentence E has a missing article, should be'…you did make an effort…'.

55. 3 In option (1) Anita wore a *brooch* is the correct option. As broach means to mention and suggest for the first time. While *brooch* means a clasp or an ornament. In the second sentence one has to meet a *councillor* to complain about neighbourhood amenities as a *councillor* draws from the word council - which is responsible for keeping the county in order. A *counsellor* is one who helps you take an informed decision about one or more of your concerns, therefore *councillor* is the right option here. In the third sentence *advice* has to take the noun form and not the verb form, therefore *advice* is the right option. *When Mr. Raymond advises people, he gives them advice.* *Climactic* refers to climax, while *climatic* to weather conditions, therefore climactic is the right option. *Flair* refers to a natural talent; it is commonplace to say that one has a *flair for writing. Flare* means to spread gradually outward, as the end of a trumpet, the bottom of a wide skirt, or the sides of a ship. Therefore, BAAAB (3) is the right option.

56. 2 *Currents* refer to prevailing or flowing, while *currants* are deciduous shrubs; therefore B is the right option. In the second sentence, *exceptional* means unusual or extraordinary. While, *exceptionable* means objectionable. *Assent* means to concur or subscribe to. While *consent* means to agree, comply or yield. In the third sentence *obliged* refers to bind morally or legally, as by a promise or contract. While, *compelled* refers to being forced. Therefore, A is the correct option. *Sanguine* refers to being cheerfully optimistic, 'far too' in the sentence provides the cue to choose

option A. While *genuine* refers to authenticity and is usually not used with *far too.* Therefore BBAAA (2) is the right option.

57. 2 *Caustic* refers to severely critical or sarcastic, while *ironic* draws from irony which refers to the use of words to convey a meaning that is the opposite of its literal meaning. Therefore B is the correct option. *Cogent* refers to clear, or an incisive presentation. While *valid* refers to being sound. And, being impassionate usually does not necessitate being valid. *Averse* means having a strong feeling of opposition, or antipathy. While *adverse* refers to something being unfavourable. Therefore B is the correct option. *Coup* is a clever action or accomplishment. A *coupé* is the end compartment in a European railroad car. Therefore, A is the correct option. *Peal* refers to a ringing of a set of bells, especially a change or set of changes rung on bells. While, *peel* refers to that which is peeled from something, as a piece of the skin or rind of a fruit. Therefore, B is the right option. Therefore, BBBAB (2) is the right option.

58. 1 *Defusing* means to remove the fuse from a bomb, mine etc. *Diffuse* means to spread or scatter widely or disseminate. Therefore B is the right option. *Baited* means to entice, especially by trickery or strategy. While, *bated* means to lessen or diminish; abate. Therefore, A is the right option. In sentence three *hoard* refers to a supply or accumulation that is hidden or carefully guarded for preservation. While, *horde* refers to a large group, mass or crowd. Therefore B is the correct option. In sentence four *interment* refers to burial, while *internment* refers to restrict to or confine within prescribed limits. Therefore B is the correct option. In sentence five *unsociable* refers to showing, or marked by a disinclination to friendly social relations; withdrawn and *unsocial* comes close in meaning to *unsociable* and is used more specifically when talking about predispositions or tendencies. Therefore, your answer choice should have corresponded with the options in the previous sentences treating these two words as synonyms. Therefore BABBA (1) is the correct answer.

59. 3 In Sentence 3 'run over' as a phrasal verb means being physically mowed down and it is not appropriate to convey the symbolic sense of brow beating somebody.

60. 4 Sentence 4 is incorrect and should be ' The doctor is on a round/the doctor is on a round of the hospital.'

61. 2 The expression 'the horse suddenly broke into a buckle' is idiomatically incorrect. The correct idiomatic expression is "broke into a gallop".

62. 5 In sentence 5, the expression '…a soldier broke the file…' is grammatically incorrect. The correct idiomatic expression is "broke ranks".

63. 3 The word 'disingenuous' means insincere and is suitable in the given context (suggested by the word- 'sinister') . The word 'victims' brings out the contrast with 'perpetrators' most aptly.

64. 4 In the first blank the word 'scrutinizers' is inappropriate as the context suggests observation and not analysis, therefore 'observers' is the right word. In the second blank 'concede' would be more appropriate than 'agree' as the sense is that of yielding ground as suggested by the expression 'forced to…'

65. 2 The best option is 2 (congenital, education) as the word 'environment' in the sentence is used figuratively to suggest the overall surroundings/conditions which shape a person. Option 3 seems close but is incorrect as the word 'climate' is insufficient to convey this figurative sense of environment.

66. 4 Going by the first blank, option (3) and (4) are close. In the second blank the context requires a word which goes along with the sense of 'minds' which are accustomed to the former or the old school of thought and hence the word 'tradition' aptly fits in here.

67. 2 In the paragraph the author suggests why the doctor loses some of his patients. Option 5 can be easily eliminated as the pronoun "these" has no antecedent in the para. Option 3 & 4 are farfetched as they are to do with the doctor's attitude towards the problem, which the para does not indicate in any way. Option 1 can also be done away with as it suggests those patients who fail to speak up and not about those who leave his treatment, as indicated in the para. Option 2 fits in perfectly as it speaks of those who have no other alternative but to seek his treatment.

68. 4 Options 1 and 3 are very generalized statements. Option 2 is a repetition of the idea presented in the beginning of the paragraph. The para talks about how developed countries indulge in trade protectionism as a move against China and India's economic rise , under the guise of climate concern. Option 4 and 5 talk about the same thing but 4 goes along with the subtle suggestive tone of the para while 5 is more curt in its accusation of 'perpetrators of inequity'.

69. 2 The para is a description of the Jewry settlement,. (4) can be eliminated as it brings in a hint of skepticism. (3) is a mere repetition of an idea already discussed in the para (that of jews being tolerant). (5) can also be eliminated as it is brings an alien concept – that of Mattancherry's popularity with the tourists . Between (1) and (2), we will eliminate (1) as it has a more conclusive tone, which is not in sync with the descriptive nature of the paragraph.

70. 5 Option 1 can be easily eliminated as it is a mere repetition of the ideas presented in the para. Option 2 is a little farfetched as it should come one or two more sentences later in the para . Option 3 does not match with the idea presented in the passage. Option 4 does not match with the tone of the paragraph. Option 5 completes the idea as the emphasis in the last line of the para is that the idea of 'pure Western and pure Indian thoughts' is deceptive.

71. 3 Refer to the 4th paragraph of the passage. The elders were of the opinion that turning of the eyes by the child while having the ice-creams in both hands could make the child fall down or trip over stones, steps in the pavement. The phrase 'rightly suggested' changes the meaning of the given sentence and hence it cannot be inferred from the passage.

72. 4 'Parvenus' refer to persons who have suddenly risen to a higher social and economic class but have not yet received social acceptance by others in that class. Hence, the phrase 'little parvenus' would appropriately refer to 'young upstarts'.

73. 2 Refer to the 5th paragraph of the passage. The sentence 'two two-cent ….suggested excess' clearly tell us that it was intemperance on part of the author which made him pine for two two-cent ice-cream cones instead of one four-cent pie.

74. 2 In the lines 'Nowadays the moralist   spoiled'. The author is talking about morality in the context of the present day world. The rest of the options are out of the scope of the passage.

75. 1 Refer to the last line of the 4th paragraph of the passage. Here the author says that the intentions of his elders in not letting him eat two-cent cones was 'cruelly pedagogical'. This implies that the justification was 'didactic' in nature. This makes option (1) correct. The rest of the options are incorrect in context of the passage. 'Dietetic' refers to anything related with diet or the use of food. 'Dialectic' refers to the nature of logical argumentation. 'Diatonic' refers to using only the seven tones of a standard scale without chromatic alterations. 'Diastolic' refers to the rhythmically occurring relaxation and the dilation of the heart chambers.

76. 5 According to popular wisdom, language is a cultural artifact or cultural invention or it is part of the leaning process or it is unique to *Homo sapiens*. But option(5) has been stated as the viewpoint of the cognitive scientists as can be seen in the lines 'Language is a complex specialized. module'. The author also agrees with the cognitive scientists' view as he confirms to the view that language comes by instinct. He further corroborates this by saying that people know how to talk in the same manner as spiders know how to spin the web.

77. 2 "Spiders know how to spin webs" highlights the inherent qualities of living species. This analogy can be replaced in a similar way by "Bees collecting nectar" which is also a part of their inane trait. Options(1), (3), (4), (5) mention traits which are acquired over a period of time by putting in some kind of effort in order to be adept at them.

78. 2 Refer to the last sentence of the 2nd paragraph of the passage. It states that 'In nature's talent show, we are simply a species of primate with our own act, a knack for communicating information about who did what to whom by modulating the sounds we make when we exhale'. Hence, communicating with each other through voice modulation is the unique quality of human beings as per the passage.

79. 1 Refer to the 3rd paragraph of the passage where the author says that the scientists believe that the complexity of language is part of our biological birthright. He further illustrates the scientists' point of view that it cannot be taught. The author strengthens this view by quoting Oscar Wilde, making option(1) as the correct answer option. The rest of the options are not mentioned in the passage.

80. 4 Throughout the passage, the author is talking about language as a type of instinct that is existent is human beings and not any specific attribute or skill that is learnt by them over a period of time. In the first paragraph, the author claims 'But I prefer the admittedly quaint term instinct'. Similarly in the last paragraph of the passage, the author concludes by saying that 'Finally, since language is the product of a well engineered biological instinct, we shall see that it is not the nutty barrel of monkeys that entertainer-columnists make it out to be'.

81. 1 The 2nd paragraph of the passage begins with 'With those caveats, it appears to me that one strand consisted to prevent bracken ferns from over running the fields'. Hence in the context of Rwanda and Haiti, the author is referring to the existence of too many people fighting for limited land and other resources. Hence, option (1) is the most appropriate answer.

82. 4 'Anthropogenic' refers to being caused or produced by human beings. So 'anthropogenic drought' refers to the drought caused by actions of human beings. Further hint is given in the 8th line of the 2nd paragraph of the passage.

83. 3 In the 3rd paragraph, refer to the lines 'At the time of previous droughts. to have reliable water supplies'. Hence, it is evident that the final drought which caused the collapse of the Maya civilization was different from the previous droughts because man had left no unoccupied land away from agriculture to start life in a new way.

84. 4 The first paragraph of the passage states that 'To summarize the Classic Maya collapse, we can tentatively identify five strands. I acknowledge, however, that Maya archaeologists still disagree vigorously among themselves-in part, because the different strands evidently varied in importance among different parts of the Maya realm; because detailed archaeological studies are available for only some Maya sites, and because it remains puzzling why most of the Maya heartland remained nearly empty of population and failed to recover after the collapse and after re-growth of forests'. Hence, there is not one specific factor that can individually explain the collapse of the Maya civilization. Therefore, the correct answer would be option 4.

85. 5 The answer is clearly indicated in the 4th paragraph of the passage where it is mentioned that the Maya kings and leaders were more focussed on their short-term concerns of enriching themselves. The entire Maya population was not obsessed with its short-term interests. Hence, it cannot be cited as one of the factors causing the collapse of the Maya society.

86. 3 In the first paragraph of the passage, refer to the lines 'Many of the concepts of modern art, by contrast, have resulted from the almost accidental meetings of groups of talented individuals at certain times and certain places'. Hence, option 3 is the reason for the emergence of the concepts of modern art.

87. 5 According to the author, with the passage of time an art movement ceases to be a living organism and it becomes a fossil. The author then takes the example of a scientist who reconstructs the life of the past era which are codified in the form of messages in the structure of a fossil. He goes on to say similarly an artist also analyses the intellectual and creative possibilities from the art movements of the past. 'Fossil' here signifies the temporal phasing of an era associated with the art movement. This makes option 5 the correct option. Option 1 is contradictory to the facts mentioned in the passage. In option 2, the word 'historic' means significant which is not being indicated by the author. Option 3 is contradictory to the author's point of view. Option 4 is out of the scope of the argument.

88. 1 Refer to the first sentence of the first paragraph of the passage where science and art have been stated as similar in including a whole range of separate, though interconnecting activities. Hence, option(1) is the correct answer.

89. 4 In the first paragraph of the passage, refer to the lines 'Briefly, then, the concepts of modern art are of legitimately visual and spiritual experience'. Hence, the ideologies of the art of the twentieth century can be better realised by the fast changing world of visual and metaphysical understanding. The rest of the options have no link with the concepts and ideologies of the art of the twentieth century.

90. 5 In the last paragraph of the passage, refer to the lines 'As T.S Eliot observed, no one starts anything from the scratch however consciously you may try to live in the present, you are still involved with a nexus of behaviour patterns bequeathed from the past. The original and creative person is not someone who ignores these patterns but someone who is able to translate and develop them so that they conform more exactly to his and our present needs'. Hence, new and original thinking is always developed on the basis of the past thoughts in order to cater to the modern needs. Therefore, option(5) is the most appropriate answer.