SECTION – I

Sub – Section I – A:
Number of Questions = 26

Note: Questions 1 to 26 one mark each.

DIRECTIONS *for Questions 1 to 4:* Answer the questions on the basis of the information given below. Prof. Singh has been tracking the number of visitors to his homepage. His service provider has provides him with the following data on the country of origin of the visitors and the university they belong to:

Number of visitors

COUNTRY	DAY		
	1	2	3
Canada	2	0	0
Netherlands	1	1	0
India	1	2	0
UK	2	0	2
USA	1	0	1

Number of Visitors

UNIVERSITY	DAY		
	1	2	3
University 1	1	0	0
University 2	2	0	0
University 3	0	1	0
University 4	0	0	2
University 5	1	0	0
University 6	1	0	1
University 7	2	0	0
University 8	0	2	0

1. University 1 can belong to

    1. UK   2. Canada   3. Netherlands   4. USA

2. To which country does University 5 belong?

    1. India or Netherlands but not USA   2. India or USA but not Netherlands
    3. Netherlands or USA but not India   4. India or USA but not UK

3. Visitors from how many universities from UK visited Prof. Singh's homepage in the three days?

    1. 1   2. 2   3. 3   4. 4

4. Which among the listed countries can possibly host three of the eight listed universities?

    1. None   2. Only UK
    3. Only India   4. Both India and UK

DIRECTIONS *for Questions 5 to 8:* Answer the questions on the basis of the information given below. A study was conducted to ascertain the relative importance that employees in five different countries assigned to five different traits in their Chief Executive Officers. The traits were compassion (C), decisiveness (D), negotiation skills (N), public visibility (P), and vision (V). The level of dissimilarity between two countries is the maximum difference in the ranks allotted by the two countries to any of the five traits. The following table indicates the rank order of the five traits for each country.

Rank	Country				
	India	China	Japan	Malaysia	Thailand
1.	C	N	D	V	V
2.	P	C	N	D	C
3.	N	P	C	P	N
4.	V	D	V	C	P
5.	D	V	P	N	D

5.   Three of the following four pairs of countries have identical levels of dissimilarity. Which pair is the odd one out?

1. Malaysia & China   2. China & Thailand
3. Thailand & Japan   4. Japan & Malaysia

6.   Which amongst the following countries is most dissimilar to India?

1. China   2. Japan   3. Malaysia   4. Thailand

7.   Which of the following countries is least dissimilar to India?

1. China   2. Japan   3. Malaysia   4. Thailand

8.   Which of the following pairs of countries are most dissimilar?

1. China & Japan   2. India & China
3. Malaysia & Japan   4. Thailand & Japan

DIRECTIONS *for Questions 9 to 12:* Answer the questions on the basis of the information given below. The data points in the figure below represent monthly income and expenditure data of individual members of the Ahuja family (■), the Bose family (□), the Coomar family (○), and the Dubey family (●). For these questions, savings is defined as
Savings = Income - Expenditure
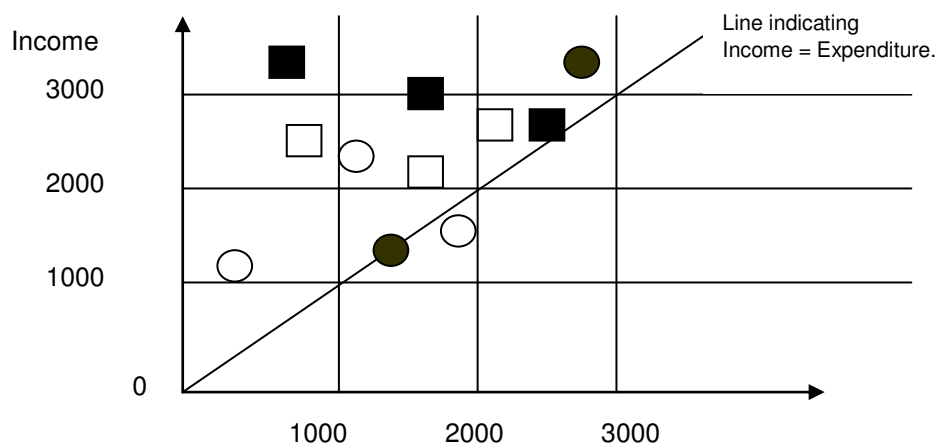
9.   Which family has the highest average expenditure?

        1. Ahuja   2. Bose   3. Coomar   4. Dubey

10.   Which family has the lowest average income?

        1. Ahuja   2. Bose   3. Coomar   4. Dubey

11.   The highest amount of savings accrues to a member of which family?

        1. Ahuja   2. Bose   3. Coomar   4. Dubey

12.   Which family has the lowest average savings?

        1. Ahuja   2. Bose   3. Coomar   4. Dubey

DIRECTIONS *for Questions 13 to 16:* Answer the questions on the basis of the information given below. The Dean's office recently scanned student results into the central computer system. When their character reading software cannot read something, it leaves that space blank. The scanner output reads as follows:

Name	Finance	Marketing	Statistics	Strategy	Operations	GPA
Aparna		B	F			1.4
Bikas	D	D	F	F		
Chandra		D	A	F	F	2.4
Deepak	A	B		D	D	3.2
Fazal	D	F	B		D	2.4
Gowri	C	C	A		B	3.8
Hari		B	A		D	2.8
Ismet			B		A	
Jagdeep	A	A	B		C	3.8
Kunal	F		A	F	F	1.8
Leena	B	A		B	F	3.2
Manab			A	B	B	
Nisha	A	D	B	A	F	3.6
Osman	C		B	B	A	4.6
Preeti	F	D		D		3.2
Rahul	A	C	A		F	4.2
Sameer		C	F	B		
Tara	B					2.4
Utkarsh			F	C	A	3.0
Vipul	A		C	C	F	2.4

In the grading system, A, B, C, D, and F grades fetch 6, 4, 3, 2, and 0 grade respectively. The Grade Point Average (GPA) is the arithmetic mean of the grade points obtained in the five subjects. For example Nisha's GPA is $(6 + 2 + 4 + 6 + 0) / 5 = 3.6$.
Some additional facts are also known about the student's grades. These are
(a). Vipul obtained the same grade in Marketing as Aparna obtained in Finance and Strategy.
(b). Fazal obtained the same grade in Strategy as Utkarsh did in Marketing.
(c). Tara received the same grade in exactly three courses.

13.   In operations, tara could have received the same grade as

        1. Ismet   2. Hari   3. Jagdeep   4. Manab

14. What grade did Preeti obtain in statistics?

    1. A   2. B   3. C   4. D

15. What grade did Utkarsh obtain in Finance?

    1. B   2. C   3.D   4. F

16. In Strategy, Gowri's grade point was higher than that obtained by

    1. Fazal   2. Hari   3. Nisha   4. Rahul

DIRECTIONS *for Questions 17 to 20:* Answer the questions on the basis of the information given below. Purana and Naya are two brands of kitchen mixer-grinders available in the local market. Purana is an old brand that was introduced in 1990, while Naya was introduced in 1997. For both these brands, 20 % of the mixer-grinders bought in a particular year are disposed off as junk exactly two years later. It is known that 10 Purana mixer-grinders were disposed off in 1997. The following figures show the number of Purana and Naya mixer-grinders in operation from 1995 to 2000, as at the end of the year.

17. How many Naya mixer-grinders were disposed off by the end of 2000?
.
    1. 10   2. 16   3. 22   4. Cannot be determined from the data

18. How many Naya mixer-grinders were purchased in 1999?

    1. 44   2. 50   3. 55   4. 64

19. How many Purana mixer-grinders were purchased in 1999?

    1. 20   2. 23   3. 50   4. Cannot be determined

20. How many Purana mixer-grinders were disposed off in 2000?

    1. 0   2. 5
    3. 6   4. Cannot be determined from the data.

DIRECTIONS *for Questions 21 to 26:* Each Question is followed by two statements, A and B. Answer each question using the following instructions:

Choose 1   if the question can be answered by using one of the statements alone but not by using the other statement alone.
Choose 2   if the question can be answered by using either of the statement alone.
Choose 3   if the question can be answered by using both statements together but not by either statement alone.
Choose 4   if the question cannot be answered on the basis of the two statements.

21.   Ravi spent less than Rs. 75 to buy one kilogram each of potato, onion, and gourd. Which one of the three vegetables bought was the costliest?

   A: 2 kg potato and 1 kg of gourd cost less than 1 kg potato and 2 kg gourd
   B: 1 kg potato and 2 kg onion together cost the same as 1 kg onion and 2 kg gourd.

22.   Tarak is standing 2 steps to the left of the red mark and 3 steps to the right of a blue mark. He tosses a coin. If it comes up heads, he moves one step towards the right; otherwise he moves one step towards the left. He keeps doing this until he reaches one of the two marks, and then he stops. At which mark does he stop?
.

   A: He stops after 21 coin tosses.
   B: He obtains three more tails than heads

23.   Nandini paid for an article using currency notes of denominations Re.1, Rs. 2, Rs. 5, and Rs. 10 using at least one note of each denomination. The total number of five and ten rupee notes used was one more than the total number of one and two rupee notes used. What was the price of the article?

   A: Nandini used a total of 13 currency notes.
   B: The price of the article was a multiple of Rs. 10.

24.   Four candidates for an award obtain distinct scores in a test. Each of the four casts a vote to choose the winner of the award. The candidate who gets the largest number of votes wins the award. In case of a tie in the voting process, the candidate with the highest score wins the award. Who wins the award?

   A: The candidates with top three scores each vote for the top scorer amongst the other three.
   B: The candidate with the lowest score votes for the player with the second highest score.

25.   In a class of 30 students, Rashmi secured the third rank among the girls, while her brother Kumar studying in the same class secured the sixth rank in the whole class. Between the two, who had a better overall rank?

   A: Kumar was among the top 25 % of the boys merit list in the class in which 60 % were boys.
   B: There were three boys among the top five rank holders, and three girls among the top ten rank holders.

26.   Zakib spends 30 % of his income on his children's education, 20 % on recreation and 10 % on healthcare. The corresponding percentages for Supriyo are 40 %, 25 %, and 13 %. Who spends more on children's education?

   A: Zakib spends more on recreation than Supriyo.
   B: Supriyo spends more on healthcare than Zakib.

Sub – Section I – B:
Number of Questions = 12

Note: Questions 27 to 38 carry two marks each.

DIRECTIONS *for Questions 27 to 30:* Answer the questions on the basis of the information given below.

Coach John sat with the score cards of Indian players from the 3 games in a one-day cricket tournament where the same set of players played for India and all the major batsmen got out. John summarized the batting performance through three diagrams, one for each game. In each diagram, the three outer triangles communicate the number of run scored by the three top scorers from India, where K, R, S, V, and Y represent Kaif, Rahul, Saurav, Virender, and Yuvraj respectively. The middle triangle in each diagram denotes the percentage of total score of the above mentioned five playersthat was scored by the top three Indians scorers in that game. No two players score the same number of runs in the same game. John also calculated two batting indices for each player based on his scores in the tournament; the R-index of a batsman is the difference between his highest and lowest scores in the 3 games while the M-index is the middle number, if his scores are arranged in a non-increasing order.
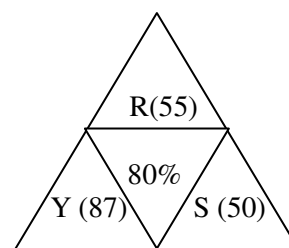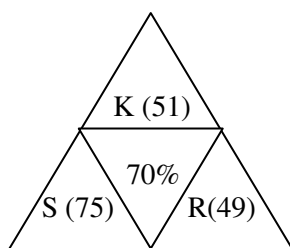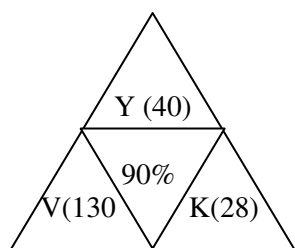
27. Which of the players had the best M-index from the tournament?

1. Rahul   2. Saurav   3. Virender   4. Yuvraj

28. Among the players mentioned, who can have the lowest R-index from the tournament?

1. Only Kaif, Rahul or Yuvraj   2. Only Kaif or Rahul
3. Only Kaif or Yuvraj   4. Only Kaif

29. For how many Indians players is it possible to calculate the exact M-index?

1. 0   2. 1   3. 2   4. More than 2

30. How many players among those listed definitely scored less than Yuvraj in the tournament?

1. 0   2. 1   3. 2   4. More than 2

DIRECTIONS *for Questions 31 to 34:* Answer the questions on the basis of the information given below.

Twenty-one participants from four continents (Africa, Americas, Australasia, and Europe) attended a United Nations Conference. Each participant was an expert in one of four fields, labour, health, population studies, and refugee relocation. The following five facts about the participants are given.

(a).   The number of labour experts in the camp was exactly half the number of experts in each of the three other categories.

(b).   Africa did not send any labour expert. Otherwise, every continent, including Africa, sent atleast one expert for each category.

(c).   None of the continents sent more than three experts in any category.

(d).   If there had been one less Australasian expert, then the Americas would have had twice as many expert as each of the other countries.

(e).   Mike and Alfanso are leading experts of population studies who attended the conference. They are from Australasia.

31.   Which of the following numbers cannot be determined from the information given?

1.   Number of labour experts from the Americas
2.   Number of health experts from Europe.
3.   Number of health experts from Australasia
4.   Number of experts in refugee relocation from Africa

32.   Which of the following combinations is NOT possible?

1.   2 experts in population studies from the Americas and 2 health experts from Africa attended the conference.
2.   2 experts in population studies from the Americas and 1 health expert from Africa attended the conference.
3.   3 experts in refugee relocation from the Americas and 1 health expert from Africa attended the conference.
4.   Africa and America each had 1 expert in population studies attending the conference.

33.   If Ramos is the lone American expert in population studies, which of the following is NOT true bout the number of experts in the conference from the four continents?

1.   There is one expert in health from Africa.
2.   There is one expert in refugee relocation from Africa.
3.   There are two experts in health from the Americas
4.   There are three experts in refugee relocation from the Americas.

34.   Alex, an American expert in refugee relocation, was the first keynote speaker in the conference. What can be inferred about the number of American experts in refugee relocation in the conference, excluding Alex?
i.   At least one.
ii. At most two

1.   Only i and not ii
2.   Only ii and not i
3.   Both i and ii
4.   Neither i nor ii

DIRECTIONS *for Questions 35 to 38:* Answer the questions on the basis of the information given below.

The year was 2006. All six teams in Pool A of World Cup hockey play each other exactly once. Each win earns a team three points, a draw earns one point and a loss earns zero points. The two teams with the highest points qualify for the semi-finals. In case of a tie, the team with the highest goal difference (Goal For-Goals Against) qualifies.In the opening match, Spain lost to Germany. After the second round (after each team played two matches), the pool table looked as shown below.

Pool A

Teams	Games Played	Won	Drawn	Lost	Goals For	Goals Against	Points
Germany	2	2	0	0	3	1	6
Argentina	2	2	0	0	2	0	6
Spain	2	1	0	1	5	2	3
Pakistan	2	1	0	1	2	1	3
New Zealand	2	0	0	2	1	6	0
South Africa	2	0	0	2	1	4	0

In the third round, Spain played Pakistan, Germany played New Zealand, and Argentina played South Africa. All the third round matches were drawn. The following are some results from the fourth and fifth round matches.

(a)   Spain won both the fourth and fifth round matches.
(b)   Both South Africa and Germany won their fourth and fifth round matches respectively by 3 goals to 0 each.
(c)   Pakistan won both the fourth and fifth round matches by 1 goal to 0

35.   Which one of the following statements is true about matches played in the first two rounds?

1.   Pakistan beat South Africa by 2 goals to 0.
2.   Argentina beat Pakistan by 1 goal to 0
3.   Germany beat Pakistan by 2 goals to 1
4.   Germany beat Spain by 2 goals to 1

36.   Which one of the following statements is true about matches played in the first two rounds?

1.   Germany beat New Zealand by 1 goal to 0
2.   Spain beat New Zealand by 4 goals to 0
3.   Spain beat South Africa by 2 goals to 0
4.   Germany beat South Africa by 2 goals to 1

37.   If Pakistan qualified as one of the two teams from Pool A, which was the other team that qualified?

1. Argentina   2. Germany   3. Spain   4. Cannot be determined.

38. Which team finished at the top of the pool after five rounds of matches?

1. Argentina   2. Germany   3. Spain   4. Cannot be determined

SECTION – II

Sub – Section II – A:
Number of Questions = 20

Note: Questions 39 to 58 carry one mark each.

DIRECTIONS *for questions 39 to 55:* Answer the question independently of each other.

39.   A father and his son are waiting at a bus stop in the evening. There is a lamp post behind them. The lamp post, the father and his son stand on the same straight line. The father observes that the shadow of his head and his son's head are incident at the same point on the ground. If the heights of the lamp post, the father and his son are 6 metres, 1.8 metres and 0.9 metres respectively, and the father is standing 2.1 metres away from the post, then how far (in metres) is the son standing from his father?

   1. 0.9   2. 0.75   3. 0.6   4. 0.45

40.   A milkman mixes 20 litres of water with 80 litres of milk. After selling one-fourth of this mixture, he adds water to replenish the quantity that he has sold. What is the current proportion of water to milk?

   1. 2: 3   2. 1: 2   3. 1: 3   4. 3: 4

41.   Karan and Arjun run a 100-metre race, where Karan beats Arjun by 10 metres. To do a favour to Arjun, Karan starts 10 metres behind the starting line in a second 100-metre race. They both run at their earlier speeds. Which of the following is true in connection with the second race?

   1.   Karan and Arjun reach the finishing line simultaneously.
   2.   Arjun beats Karan by 1 metre.
   3.   Arjun beats Karan by 11 metres
   4.   Karan beats Arjun by 1 metre.

42.   N persons stand on the circumference of a circle at distinct points. Each possible pair of persons, not standing next to each other, sings a two-minute song one pair after the other. If the total time taken for singing is 28 minutes, what is N?

   1. 5   2. 7   3. 9   4. None of the above

43.   If the sum of the first 11 terms of an arithmetic progression equals that of the first 19 terms, then what is the sum of the first 30 terms?

   1. 0   2. –1   3. 1   4. Not unique

44.   If a man cycles at 10 km/hr, then he arrives at a certain place at 1 p.m. If he cycles at 15 km/hr, he will arrive at the same place at 11a.m. At what speed must he cycle to get there at noon?

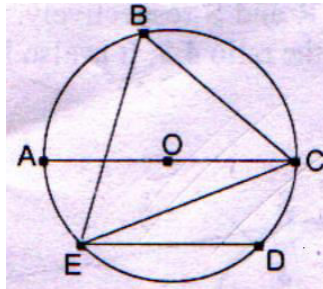   1. 11 km/hr   2. 12 km/hr   3. 13 km/hr   4. 14 km/hr

45. On January 1, 2004 two new societies, S_1 and S_2, are formed, each with n numbers. On the first day of each subsequent month, S_1 adds b members while S_2 multiplies its current number of members by a constant factor r. Both the societies have the same number of members on July 2, 2004. If b = 10.5n, what is the value of r?

1. 2.0   2. 1.9   3. 1.8   4. 1.7

46. The total number of integer pairs (x, y) satisfying the equation $x + y = xy$ is

1. 0   2. 1   3. 2   4. None of the above

47. If $f(x) = x^3 - 4x + p$, and $f(0)$ and $f(1)$ are of opposite signs, then which of the following is necessarily true?

1. $-1 < p < 2$ 2. $0 < p < 3$ 3. $-2 < p < 1$ 4. $-3 < p < 0$

48. Suppose n is an integer such that the sum of the digits of n is 2, and $10^{10} < n < 10^{11}$. The number of different values for n is

1. 11   2. 10   3. 9   4. 8

49. If $a/(b + c) = b/(c + a) = c/(a + b) = r$ then r cannot take any value except

1. $1/2$ 2. -1 3. $1/2$ or -1 4. $-1/2$ or -1

50. Let $y = \cfrac{1}{2 + \cfrac{1}{3 + \cfrac{1}{2 + \cfrac{1}{3 + ...}}}}$

What is the value of y?

1. $\dfrac{\sqrt{13} + 3}{2}$ 2. $\dfrac{\sqrt{13} - 3}{2}$ 3. $\dfrac{\sqrt{15} + 3}{2}$ 4. $\dfrac{\sqrt{15} - 3}{2}$

51. Let $f(x) = ax^2 - b\,|x|$, where a and b are constants. Then at $x = 0$, $f(x)$ is

1. Maximized whenever $a > 0$, $b > 0$ 2. Maximized whenever $a > 0$, $b < 0$
3. Minimized whenever $a > 0$, $b > 0$ 4. Minimized whenever $a > 0$, $b < 0$

52. Two boats, travelling at 5 and 10 kms per hour, head directly towards each other. They begin at a distance of 20 kms from each other. How far apart are they (in kms) one minute before they collide?

1. $1/12$ 2. $1/6$ 3. $1/4$ 4. $1/3$

53. Each family in a locality has at most two adults, and no family has fewer than 3 children. Considering all the families together, there are more adults than boys, more boys than girls, and more girls than families. Then the minimum possible number of families in the locality is

 1. 4 2. 5 3. 2 4. 3

54. In Nuts and Bolts factory, one machine produces only Nuts at the rate of 100 nuts per minute and needs to be cleaned for 5 minutes after production of every 1000 nuts. Another machine produces only Bolts at the rate of 75 bolts per minute and needs to be cleaned for 10 minutes after production of every 1500 bolts. If both the machines start production at the same time, what is the minimum duration required for producing 9000 pairs of nuts and bolts?

 1. 130 minutes 2. 135 minutes 3. 170 minutes 4. 180 minutes

55. A rectangular sheet of paper, when halved by folding it at the mid point of its longer side, results in a rectangle, whose longer and shorter sides are in the same proportion as the longer and shorter sides of the original rectangle. If the shorter side of the original rectangle is 2, what is the area of the smaller rectangle?

 1. $4\sqrt{2}$ 2. $2\sqrt{2}$ 3. $\sqrt{2}$ 4. None of the above

DIRECTIONS *for Questions 56 to 58:* Answer the questions on the basis of the information given below.

In the adjoining figure, I and II are circles with centres P and Q respectively. The two circles touch each other and have a common tangent that touches them at points R and S respectively. The common tangent meets the line joining P and Q at O. The diameters of I and II are in the ratio 4: 3. It is also known that the length of PO is 28 cm.

56. What is the ratio of the length of PQ to that of QO?

 1. 1: 4 2. 1: 3 3. 3: 8 4. 3: 4

57. What is the radius of the circle II?

 1. 2 cm 2. 3 cm 3. 4 cm 4. 5 cm

58. The length of SO is

 1. $8\sqrt{3}$ cm 2. $10\sqrt{3}$ cm 3. $12\sqrt{3}$ cm 4. $14\sqrt{3}$ cm.

Sub-section II – B:
Number of Questions = 15

Note: **Questions 59 to 73 carry two marks each.**

DIRECTIONS *for Questions 59 and 60:* Answer the questions independently of each other.

59.   In the adjoining figure, chord ED is parallel to the diameter AC of the circle If $\angle$ CBE = 65^0, then what is the value of $\angle$DEC?

        1. 35^0 2. 55^0 3. 45^0 4. 25^0

60.   On a semicircle with diameter AD, chord BC is parallel to the diameter. Further, each of the chords AB and CD has length 2, while AD has length 8. What is the length of BC?
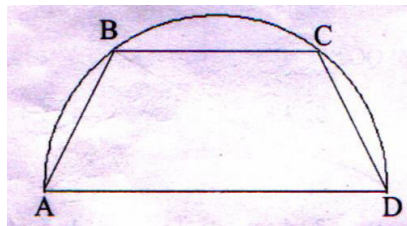
        1. 7.5   2. 7   3. 7.75   4. None of the above

DIRECTIONS *for Questions 61 and 62:* Answer the questions on the basis of the information given below.

$$
\begin{array}{llll}
f_1(x) & === & x & 0 \le x \le 1 \\
 & = & 1 & x \ge 1 \\
 & = & 0 & \text{Otherwise} \\
f_2(x) & = & f_1(-x) & \text{For all } x \\
f_3(x) & = & -f_2(x) & \text{For all } x \\
f_4(x) & = & f_3(-x) & \text{For all } x \\
\end{array}
$$

61.   How many of the following products are necessarily zero for every x:
        $f_1(x)f_2(x),\ f_2(x)f_3(x),\ f_2(x)f_4(x)$

        1. 0   2. 1   3. 2   4. 3

62.   Which of the following is necessarily true?

        1. $f_4(x) = f_1(x)$ for all x 2. $f_1(x) = -f_3(-x)$ for all x
        3. $f_2(-x) = f_4(x)$ for all x 4. $f_1(x) + f_3(x) = 0$ for all x

DIRECTIONS *for Questions 63 and 64:* Answer the questions on the basis of the information given below.

In an examination, there are 100 questions divided into three groups A, B and C such that each group contains at least one question. Each question in group A carries 1 mark, each question in group B carries 2 marks and each question in group C carries 3 marks. It is known that the questions in group A together carry at least 60 % of the total marks.

63. If group B contains 23 questions, then how many questions are there in group C?

1. 1   2. 2   3. 3   4. Cannot be determined

64. If group C contains 8 questions and group B carries at least 20 % of the total marks, which of the following best describes the number of questions in group B?

1. 11 or 12   2. 12 or 13   3. 13 or 14   4. 14 or 15

DIRECTIONS *for Questions 65 to 73:* Answer the questions independently of each other.

65. A sprinter starts running on a circular path of radius r metres. Her average speed (in metres / minute) is πr during the first 30 seconds, $\pi r / 2$ during next one minute, $\pi r / 4$ using next 4 minutes, and so on. What is the ratio of the time taken for the nth round to that for previous round?

1. 4   2. 8   3. 16   4. 32

66. Consider the sequence of numbers $a_1, a_2, a_3,.....$ To identify where $a_1 = 81.33$ and $a_2 = -19$ and $a_j = a_{j-1} - a_{j-2}$ for $j \geq 3$. What is the sum of the first 6002 terms of this sequence?

1. – 100.33   2. – 30.00   3. 62.33   4. 119.33

67. The remainder, when $(15^{23} + 23^{23})$ is divided by 19, is

1. 4   2. 15   3. 0   4. 18

68. In the adjoining figure, the lines represent one-way roads allowing travel only northwards or only westwards. Along how many distinct routes can a car reach point B from point A?
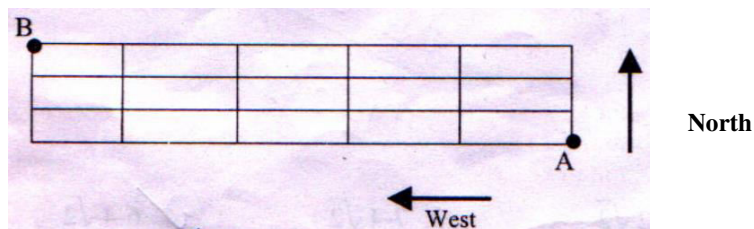
1. 15   2. 56   3. 120   4. 336

69. Let C be a circle with centre P_o and AB be a diameter of C. Suppose P_1 is the mid point of the line segment $P_0 B$, P_2 is the mid point of the line segment $P_1 B$ and so on. Let $C_1, C_2, C_3, \ldots$ be circles with diameters $P_0 P_1, P_1 P_2, P_2 P_3, \ldots$ respectively. Suppose the circles $C_1, C_2, C_3, \ldots$ are all shaded. The ratio of the area of the unshaded portion of C to that of the original circle C is

1. 8: 9   2. 9: 10   3. 10: 11   4. 11: 12

70. Let u = $(\log_2 x)^2 - 6\log_2 x + 12$ where x is a real number. Then the equation $x^u = 256$, has

1. No solution for x 2. Exactly one solution for x
3. Exactly two distinct solutions for x 4. Exactly three distinct solutions for x

71. A new flag is to be designed with six vertical stripes using some or all of the colours yellow, green, blue and red. Then, the number of ways it can be done such that no two adjacent stripes have the same colour is

1. 12×81 2. 16×192 3. 20×125 4. 24×216

72. If the lengths of diagonals DF, AG, and CE of the cube shown in the adjoining figure are equal to the three sides of a triangle, then the radius of the circle circumscribing that triangle will be
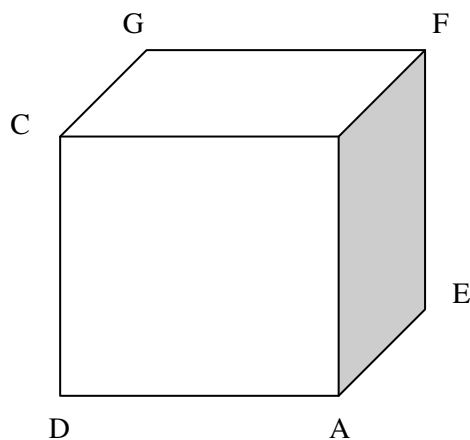
1. equal to the side of the cube   2. $\sqrt{3}$ times the side of the cube
3. $1/\sqrt{3}$ times the side of the cube   4. Impossible to find from the given information

73. A circle with radius 2 is placed against a right angle. Another smaller circle is also placed as shown in the adjoining figure. What is the radius of the smaller circle?
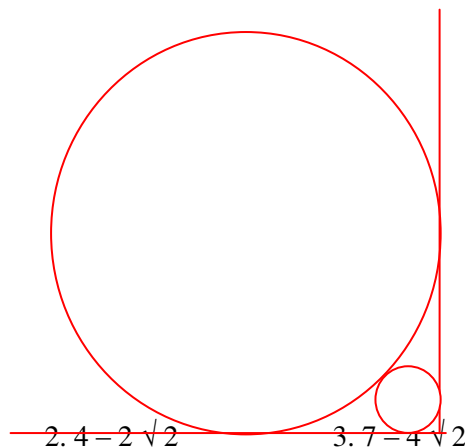
1. $3 - 2\sqrt{2}$ 2. $4 - 2\sqrt{2}$ 3. $7 - 4\sqrt{2}$ 4. $6 - 4\sqrt{2}$

SECTION – III

Sub – Section III – A:
Number of Questions = 45

Note: Questions 74 to 83 carry half a mark each.
All the other questions in Sub-section 3-A carry one mark each.

DIRECTIONS *for Questions 74 to 83: Fill up the blanks numbered [74], [75] ...up to [83], in the two passages below using the most appropriate word from the options given for each blank.*

At that time the White House was as serene as a resort hotel out of season. The corridors were **[74]** In the various offices, **[75]** gray men in waistcoats talked to one another in low-pitched voices. The only color, or choler, curiously enough, was provided by President Eisenhower himself. Apparently, his **[76]** was easily set off; he scowled when he **[77]** the corridors.

74.	1. Striking	2. Hollow	3. Empty	4. White
75.	1. Quiet	2. Faded	3. Loud	4. Stentorian
76.	1. Laughter	2. Curiosity	3. Humour	4. Temper
77.	1. Paced	2. Strolled	3. Stormed	4. Prowled

"Between the year 1946 and the year 1955, I did not file any income tax returns." With that **[78]** statement, Ramesh embarked on an account of his encounter with the Income Tax Department. "I originally owed Rs. 20,000 in unpaid taxes. With **[79]** and **[80],** the 20,000 became 60,000. The Income Tax Department then went into action, and I learned first hand just how much power the Tax Department wields. Royalties and trust funds can be **[81];** automobiles may be **[82],** and auctioned off. Nothing belongs to the **[83]** until the case is settled."

78.	1. Devious	2. Blunt	3. Tactful	4. Pretentious
79.	1. Interest	2. Taxes	3. Principal	4. Returns
80.	1. Sanctions	2. Refunds	3. Fees	4. Fines
81.	1. Closed	2. Detached	3. Attached	4. Impounded
82.	1. Smashed	2. Seized	3. Dismantled	4. Frozen
83.	1. Purchaser	2. Victim	3. Investor	4. Offender

DIRECTIONS *for Questions 84 to 86: Identify the incorrect sentence or sentences.*

84.   A.   Harish told Raj to plead guilty.
   B.   Raj pleaded guilty of stealing money from the shop.
   C.   The court found Raj guilty of all the crimes he was charged with.
   D.   He was sentenced for three years in jail.

   1. A and C   2. B and D   3. A, C, and D   4. B, C, and D

85.   A.   Last Sunday, Archana had nothing to do.
          B.   After waking up, she lay on the bed thinking of what to do.
          C.   At 11 o' clock she took shower and got ready.
          D.   She spent most of the day shopping.

1. B and C   2. C   3. A and B   4. B, C, and D

86.   A.   It was a tough situation and Manasi was taking pains to make it better.
          B.   Slowly her efforts gave fruit and things started improving.
          C.   Everyone complemented her for her good work.
          D.   She was very happy and thanked everyone for their help.

1. A   2. D   3. B and C   4. A and C

DIRECTIONS *for Questions 87 to 89: Each statement has a part missing. Choose the best option from the four options given below the statement to make up the missing part.*

87.   The ancient Egyptians believed _____ so that when these objects were magically reanimated through the correct rituals, they would be able to function effectively.

1.   That it was essential that things they potrayed must have every relevant feature shown as clearly as possible.
2.   It was essential for things they potray to have had every relevant feature shown as elearly as possible,
3.   It was essential that the things they potrayed had every relevant feature shown as clearly as possible
4.   Then when they potrayed things, it should have every relevant feature shown as clearly as possible

88.   Archaeologists believe that the pieces of red-ware pottery excavated recently near Bhavnagar and _____ shed light on a hitherto dark 600-year period in the Harappan history of Gujrat.

1.   Estimated with a reasonable certainty as being about 3400 years old.
2.   Are estimated reasonably certain to be about 3400 years old
3.   Estimated at about 3400 years old with reasonable certainty.
4.   Estimated with reasonable certainty to be about 3400 years old.

89.   Many people suggest _____and still others would like to convince people not to buy pirated cassettes.

1.   To bring down audiocassette prices to reduce the incidence of music piracy, others advocate strong legal action against the offenders.
2.   Bringing down audiocassette prices to reduce the incidents of music piracy, others are advocating strong legal action against offenders,
3.   Bringing down audiocassette prices to reduce the incidents of music piracy, others advocate strong legal action against offenders,
4.   Audiocassettes prices to be brought down to reduce incidence of music piracy, others advocate that strong legal action must be taken against offenders.

DIRECTIONS *for Questions 90 to 92:* In each question, the word at the top of the table is used in four different ways, numbered 1 to 4. Choose the option in which the usage of the word is INCORRECT or INAPPROPRIATE

90.   BOLT

1.	The shopkeeper showed us a bolt of fine silk
2.	As he could not move, he made a bolt for the gate.
3.	Could you please bolt the door?
4.	The thief was arrested before he could bolt from the scene of the crime.

91.   PASSING

1.	She did not have passing marks in mathematics.
2.	The mad woman was cursing everybody passing her on the road.
3.	At the birthday party all the children enjoyed a game of passing the parcel.
4.	A passing taxi was stopped to rush the accident victim to the hospital.

92.   FALLOUT

1.	Nagasaki suffered from the fallout of nuclear radiation.
2.	People believed that the political fallout of the scandal would be insignificant.
3.	Who can predict the environmental fallout of the WTO agreements?
4.	The headmaster could not understand the fallout of several of his good students at the public examination.

DIRECTIONS *for Questions 93 to 95: The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.*

93.   A.   The two neighbours never fought each other.
        B.   Fights involving three male fiddler crabs have been recorded, but the status of the participants was unknown.
        C.   They pushed or grappled only with the intruder.
        D.   We recorded 17 cases in which a resident that was fighting an intruder was joined by an immediate neighbour, an ally.
        E.   We therefore tracked 268 intruder males until we saw them fighting a resident male.

        1. BEDAC   2. DEBAC   3. BDCAE   4. BCEDA

94.   A.   He felt justified in bypassing Congress altogether on a variety of moves.
        B.   At times he was fighting the entire Congress.
        C.   Bush felt he had a mission to restore power to the presidency.
        D.   Bush was not fighting just the democrats.
        E.   Representative democracy is a messy business, and a CEO of the White House does not like a legislature of second guessers and time wasters.

        1. CAEDB   2. DBAEC   3. CEADB   4. ECDBA

95. A. In the west, Allied Forces had fought their way through Southern Italy as far as Rome.
     B. In June 1944 Germany's military position in World War Two appeared hopeless
     C. In Britain, the task of amassing the men and materials for the liberation of northern Europe had been completed
     D. The Red Army was poised to drive the Nazis back through Poland.
     E. The situation on the eastern front was catastrophic.

     1. EDACB   2. BEDAC   3. BDECA   4. CEDAB

DIRECTIONS *for Questions 96 and 97:* Four alternative summaries are given below each text. Choose the option that best captures the essence of the text.

96. You seemed at first to take no notice of your school-fellows, or rather to set yourself against them because they were strangers to you. They knew as little of you as you did of them; this would have been the reason for their keeping aloof from you as well, which you would have felt as a hardship. Learn never to conceive a prejudice against others because you know nothing of them. It is bad reasoning, and makes enemies of half the world. Do not think ill of them till they behave ill to you; and then strive to avoid the faults which you see in them. This will disarm their hostility sooner than pique or resentment or complaint.

     1. The discomfort you felt with your school fellows was because both sides knew little of each other. You should not complain unless you find others prejudiced against you and have attempted to carefully analyze the faults you have observed in them
     2. The discomfort you felt with your school fellows was because both sides knew little of each other. Avoid prejudice and negative thoughts till you encounter bad behaviour from others, and then win them over by shunning the faults you have observed.
     3. You encountered hardship amongst your school fellows because you did not know them well. You should learn to not make enemies because of your prejudices irrespective of their behaviour towards you.
     4. You encountered hardship amongst your school fellows because you did not know them well. You should learn to not make enemies because of yours prejudices unless they behave badly with you.

97. The human race is spread all over the world, from the Polar Regions to the tropics. The people of whom it is made up eat different kinds of food, partly according to the climate in which they live, and partly according to the kind of food which their country produces. In hot climates, meat and fat are not much needed; but in the Arctic regions they seem to be very necessary for keeping up the heat of the body. Thus, in India, people live chiefly on different kinds of grains, eggs, milk, or sometimes fish and meat. In Europe, people eat more meat and less grain. In the Arctic regions, where no grains and fruits are produced, the Eskimo and other races live almost entirely on meat and fish.

     1. Food eaten by people in different regions of the World depends on the climate and produce of the region, and varies from meat and fish in the Arctic to predominantly grains in the tropics.
     2. Hot climates require people to eat grains while cold regions require people to eat meat and fish.
     3. In hot countries people eat mainly grains while in the Arctic, they eat meat and fish because they cannot grow grains.
     4. While people in Arctic regions like meat and fish and those in hot regions like India prefer mainly grains, they have to change what they eat depending on the local climate and the local produce.

DIRECTIONS *for Questions 98 to 118: Each of the five passages given below is followed by a set of questions. Choose the best answer to each question.*

PASSAGE I

Recently I spent hours sitting under a tree in my garden with the social anthropologist William Ury, a Harvard University professor who specializes in the art of negotiation and wrote the bestselling book, *Getting To Yes*. He captivated me with his theory that tribalism protects people from their fear of rapid change. He explained that the pillars of tribalism that humans rely on for security would always counter any significant cultural or social change. In this way, he said, change is never allowed to happen too fast. Technology, for example, is a pillar of society. Ury believes that every time technology moves in a new or radical direction, another pillar such as religion or nationalism will grow stronger – in effect, the traditional and familiar will assume greater importance to compensate for the new and untested. In this manner, human tribes avoid rapid change that leaves people insecure and frightened. But we have all heard that nothing is as permanent as change. Nothing is guaranteed. Pithy expressions, to be sure, but no more than clichés. As Ury says, people don't live that way from day-to-day. On the contrary, they actively seek certainty and stability. They want to know they will be safe.

Even so, we scare ourselves constantly with the idea of change. AN IBM CEO once said: 'We only re-structure for a good reason, and if we haven't re-structured in a while, that's good reason.' We are we scared that competitors, technology and the consumer will put us out of business – so we have to change all the time just to stay alive. But if we asked our fathers and grandfathers, would they have said that they lived in a period of little change? Structure may not have changed much. It may just be the speed with which we do things.

Change is over-rated, anyway. Consider the automobile. It's an especially valuable example, because the auto industry has spent tens of billions of dollars on research and product development in the last 100 years. Henry Ford's first car had a metal chassis with an internal combustion, gasoline-powered engine, four wheels with rubber tyres, a foot operated clutch assembly and brake system, a steering wheel, and four seats, and it could safely do 18 miles per hour. A hundred years and tens of thousands of research hours later, we drive cars with a metal chassis with an internal combustion, gasoline-powered engine, four wheels with rubber tyres, a foot operated clutch assembly and brake system, a steering wheel, four seats – and the average speed in London in 2001 was 17.5 miles per hour!

That's not a hell of a lot of return for the money. Ford evidently doesn't have much to teach us about change. The fact that they're still manufacturing cars is not proof that Ford Motor Co. is a sound organization, just proof that it takes very large companies to make cars in great quantities – making for an almost impregnable entry barrier.

Fifty years after the development of the jet engine, planes are also little changed. They've grown bigger, wider and can carry more people. But those are incremental, largely cosmetic changes.

Taken together, this lack of real change has come to mean that in travel – whether driving or flying – time and technology have not combined to make things much better. The safety and design have of course accompanied the times and the new volume of cars and of flights, but nothing of any significance has changed in the basic assumptions of the final product.

At the same time, moving around in cars or aeroplanes become less and less efficient all the time. Not only has there been no great change, but also both forms of transport have deteriorated as more people clamour to use them. The same is true for telephones, which took over hundred years to become mobile, or photographic film, which also requires an entire century to change.

The only explanation for this is anthropological. Once established in calcified organizations, humans do two things; sabotage changes that might render people dispensable, and ensure industry-wide emulation. In the 1960s, German auto companies developed plans to scrap the entire combustion engine for an electrical design. (The same existed in the 1970s in Japan, and in the 1980s in France.) So for 40 years we might have been free of the wasteful and ludicrous dependence on fossil fuels. Why didn't it go anywhere?

Because auto executives understood pistons and carburettors, and would be loath to cannibalise their expertise, along with most of their factories.

98. According to the passage, which of the following statements is true?

1. Executives of automobile companies are inefficient and ludicrous.
2. The speed at which an automobile is driven in a city has not changed much in a century.
3. Anthropological factors have fostered innovation in automobiles by promoting use of new technologies.
4. Further innovation in jet engines has been more than incremental.

99. Which of the following views does the author fully support in the passage?

1. Nothing is as permanent as change.
2. Change is always rapid.
3. More money spent on innovation leads to more rapid change.
4. Over decades, structural change has been incremental.

100. Which of the following best describes one of the main ideas discussed in the passage?

1. Rapid change is usually welcomed in society.
2. Industry is not as innovative as it is made out to be.
3. We should have less change than what we have now.
4. Competition spurs companies into radical innovation.

101. According to the passage, the reason why we continued to be dependent on fossil fuels is that:

1. Auto executives did not wish to change.
2. No alternative fuels were discovered.
3. Change in technology was not easily possible.
4. German, Japanese and French companies could not come up with new technologies.

PASSAGE II

The painter is now free to paint anything he chooses. There are scarcely any forbidden subjects, and today everybody is prepared to admit that painting of some fruit can be as important as a painting of a hero dying. The Impressionist did as much as anybody to win this previously unheard-of freedom for the artist. Yet, by the next generation, painters began to abandon the subject altogether, and began to paint abstract pictures. Today the majority of pictures painted are abstract.

Is there a connection between these two developments? Has art gone abstract because the artist is embarrassed by his freedom? Is it that, because he is free to paint anything, he doesn't know what to paint? Apologists for abstract art often talk of it as the art of maximum freedom. But could this be the freedom of the Desert Island? It would take too long to answer these questions properly. I believe there is a connection. Many things have encouraged the development of abstract art. Among them has been the artists' wish to avoid the difficulties of finding subjects when all subjects are equally possible.

I raise the matter now because I want to draw attention to the fact that the painter's choice of a subject is a far more complicated question than it would at first seem. The subject does not start with what is put in front of the easel or with something which the painter happens to remember. A subjects starts with the painter deciding he would like to paint such-and-such because for some reason or other he finds it meaningful. A subject begins when the artist selects something for special mention. (What makes it special or meaningful may seem to the artist to be purely visual – its colours or its form.) When the subject has been selected, the function of the painting itself is to communicate and justify the significance of that selection.

It is often said today that subject matter is unimportant. But this is only a reaction against the excessively literary and moralistic interpretation of subject matter in the nineteenth century. In truth the subject is literally the beginning and end of a painting. The painting begins with a selection (I will paint this and not everything else in the world); it is finished when that selection is justified (now you can see all that I saw and felt in this and how it is more than merely itself).

Thus, for a painting to succeed it is essential that the painter and his public agree about what is significant. The subject may have a personal meaning for the painter or individual spectator; but there must also be the possibility of their agreement on its general meaning. It is at this point that the culture of the society and period in question precedes the artist and his art. Renaissance art would have meant nothing to the Aztecs—and vice versa. If, to some extent, a few intellectuals can appreciate them both today it is because their culture is an historical one: its inspiration is history and therefore it can include within itself, in principle if mot in every particular, all known developments to date.

When a culture is secure and certain of its values, it presents its artists with subjects. The general agreement about what is significant is so well established that the significance of a particular subject accrues and becomes traditional. This is true, for instance, of reeds and water in China, of the nude body in Renaissance, of the animal in Africa. Furthermore, in such cultures the artist is unlikely to be a free agent: he will be employed for the sake of particular subjects, and the problem, as we have just described it, will not occur to him.

When a culture is in a state of disintegration or transition the freedom of the artist increases—but the question of subject matter becomes problematic for him: he, himself, has to choose for society. This was at the basis of all the increasing crises in European art during the nineteenth century. It is too often forgotten how many of the art scandals of that time were provoked by the choice of subject (Gericault, Courbet, Daumier, Degas, Lautrec, Van Gogh, etc.).

By the end of the nineteenth century there were, roughly speaking, two ways in which the painter could meet this challenge of deciding what to paint and so choosing for society. Either he identified himself with the people and so allowed their lives to dictate his subjects to him; or he had to find his subjects within himself as painter. By people I mean everybody except the bourgeoisie. Many painters did of course work for the bourgeoisie according to their copy-book of approved subjects, but all of them, filling the Salon and the Royal Academy year after year, are now forgotten, buried under the hypocrisy of those they served so sincerely.

102. When a culture is insecure, the painter chooses his subject on the basis of:

1. The prevalent style in the society of his time.
2. Its meaningfulness to the painter.
3. What is put in front of the easel.
4. Past experience and memory of the painter.

103. In the sentence, "I believe there is a connection" (second paragraph), what two developments is the author referring to?

1. Painters using a dying hero and using a fruit as a subject of painting.
2. Growing success of painters and an increase in abstract forms.
3. Artists gaining freedom to choose subjects and abandoning subjects altogether.
4. Rise of Impressionists and an increase in abstract forms.

104. Which of the following is NOT necessarily among the attributes needed for a painter to succeed:

1. The painter and his public agree on what is significant.
2. The painting is able to communicate and justify the significance of it subject selection.
3. The subject has a personal meaning for the painter.
4. The painting of subjects is inspired by historical developments.

105. In the context of the passage, which of the following statements would NOT be true?

    1.   Painters decided subjects based on what they remembered from their own lives.
    2.   Painters of reeds and water in China faced no serious problem of choosing a subject.
    3.   The choice of subject was a source of scandals in nineteenth century European art.
    4.   Agreement on the general meaning of a painting is influenced by culture and historical context.

106. Which of the following views is taken by the author?

    1.   The more insecure a culture, the greater the freedom of the artist.
    2.   The more secure a culture, the greater the freedom of the artist.
    3.   The more secure a culture, more difficult the choice of subject.
    4.   The more insecure a culture, the less significant the choice of the subject.

PASSAGE III

The viability of the multinational corporate system depends upon the degree to which people will tolerate the unevenness it creates. It is well to remember that the 'New Imperialism' which began after 1890 in a sprit of Capitalism Triumphant, soon become seriously troubled and after 1914 was characterized by war, depression, breakdown of the international economic system and war again, rather than Free Trade, Pax Britannica and Material Improvement. A major reason was Britain's inability to cope with the by-products of its own rapid accumulation of capital on the Continent and in America. Britain's policy tended to be atavistic and defensive rather than progressive—more concerned with warding off new threats than creating new areas of expansion. Ironically, Edwardian England revived the paraphernalia of the landed aristocracy it had just destroyed. Instead of embarking on a 'big push' to develop the vast hinterland of the Empire, colonial administrators often adopted policies to arrest the development of either a native capitalist class or a native proletariat which could overthrow them.

As time went on, the centre had to devote an increasing share of government activity to military and other unproductive expenditures; they had to rely on alliances with an inefficient class of landlords, officials and from the population was thus wasted locally.

The New Mercantilism (as the Multinational Corporate System of special alliances and privileges, aid and tariff, concessions is sometimes called) faces similar problems of internal and external division. The centre is troubled: excluded groups revolt and even some of the affluent are dissatisfied with the roles. Nationalistic rivalry between major capitalist countries remains an important divisive factor. Finally, there is the threat presented by the middle classes and the excluded groups of the underdeveloped countries. The national middle classes in the underdeveloped countries came to power when the centre weakened but could not, through their policy of import substitution manufacturing, establish a viable basis for sustained growth. They now face a foreign exchange crises and an unemployment (or population) crises—the first indicating their inability to function in the international economy and the second indicating their alienation from the people they are supposed to lead. In the immediate future, these national middle classes will gain a new lease of life as they take advantage of the spaces created by the rivalry between American and non-American oligopolists striving to establish global market positions.

The native capitalists will again become the champions of national independence as they bargain with multinational corporations. But the conflict at these level is more apparent than real, for in the end the fervent nationalism of the middle class asks only for promotion within the corporate structure and not for a break with that structure. In the last analysis their power derives from the metropolis and they cannot easily afford to challenge the international system. They do not command the loyalty of their own population and cannot really compete with the large, powerful, aggregate capitals from the centre. They are prisoners of the taste patterns and consumption standards set at the centre.

The main threat comes from the excluded groups. It is not unusual in underdeveloped countries for the top 5 per cent to obtain between 30 and 40 per cent of the total national income, and for the top one-third to obtain anywhere from 60 to 70 per cent. At most, one-third of the population can be said to benefit in some

sense from the dualistic growth that characterizes development in the hinterland. The remaining two-thirds, who together get only one-third of the income, are outsiders, not because they do not contribute to the economy, but because they do not share in the benefits. They provide a source of cheap labour which helps keep exports to the developed world at a low price and which has financed the urban-biased growth of recent years. In fact, it is difficult to see how the system is most underdeveloped countries could survive without cheap labour since removing it (e.g. diverting it to public works projects as is done in socialist countries) would raise consumption costs to capitalists and professional elites.

107. The author is in a position to draw parallels between New Imperialism and New Mercantilism because

1. Both originated in the developed Western capitalist countries.
2. New Mercantilism was a logical sequel to New Imperialism.
3. They create the same set of outputs—a labour force, middle classes and rival centres of capital.
4. Both have comparable uneven and divisive effects.

108. According to the author, the British policy during the 'New Imperialism' period tended to be defensive because

1. It was unable to deal with fallouts of a sharp increase in capital.
2. Its cumulative capital had undesirable side-effects.
3. Its policies favoured developing the vast hinterland.
4. It prevented the growth of a set-up which could have been capitalistic in nature.

109. In the sentence, "They are prisoners of the taste patterns and consumption standards set at the centre." (fourth paragraph), what is the meaning of the 'centre'?

1. National Government.
2. Native Capitalists.
3. New Capitalists.
4. None of the above.

110. Under New Mercantilism, the fervent nationalism of the native middle classes does not create conflict with the multinational corporations because they (the middle classes)

1. Negotiate with the multinational corporations.
2. Are dependent on the international system for their continued prosperity.
3. Are not in a position to challenge the status quo.
4. Do not enjoy popular support.

PASSAGE IV

Throughout human history the leading causes of death have been infection and trauma. Modern medicine has scored significant victories against both, and the major causes of ill health and death are now the chronic degenerative diseases, such as coronary artery disease, arthritis, osteoporosis, Alzheimer's macular degeneration, cataract and cancer. These have a long latency period before symptoms appear and a diagnosis is made. It follows that the majority of apparently healthy people are pre-ill.

But are these conditions inevitably degenerative? A truly preventive medicine that focused on the pre-ill, analysing the metabolic errors which lead to clinical illness, might be able to correct them before the first symptom. Genetic risk factors are known for all the chronic degenerative diseases, and are important to the individuals who possesses them. At the population level, however, migration studies confirm that these illnesses are linked for the most part to lifestyle factors—exercise, smoking and nutrition. Nutrition is the easiest of these to change, and the most versatile tool for affecting the metabolic changes needed to be tilt the balance away from disease.

Many national surveys reveal that malnutrition is common in developed countries. This is not the calorie and/or micronutrient deficiency associated with developing nations (Type A malnutrition); but multiple micronutrient depletion, usually combined with calorific balance or excess (Type B malnutrition). The incidence and severity of Type B malnutrition will be shown to be worse if newer micronutrient groups such as the essential fatty acids, xanthophylls and flavonoids are included in the surveys. Commonly ingested levels of these micronutreints seem to be far too low in many developed countries.

There is now considerable evidence that Type B malnutrition is a major cause of chronic degenerative diseases. If this is the case, then it is logical to treat such diseases not with drugs but with multiple micronutrient repletion, or 'pharmaco-nutrition'. This can take the form of pills and capsules— 'nutraceuticals', or food formats known as 'functional foods'. This approach has been neglected hitherto because it is relatively unprofitable for drug companies—the products are hard to patent—and it is a strategy which does not sit easily with modern medical interventionism. Over the last 100 years, the drug industry has invested huge sums in developing a range of subtle and powerful drugs to treat the many diseases we are subject to. Medical training is couched in pharmaceutical terms and this approach has provided us with an exceptional range of therapeutic tools in the treatment of disease and in acute medical emergencies. However, the pharmaceutical model has also created unhealthy dependency culture, in which relatively few of us accept responsibility for maintaining our own health. Instead, we have handed over this responsibility to health professionals who know very little health maintenance, or disease prevention.

One problem for supporters of this argument is lack of the right kind of hard evidence. We have a wealth of epidemiological data linking dietary factors to health profiles / disease risks, and a great deal of information on mechanism: how food factors interact with our biochemistry. But almost all intervention studies with micronutreints, with the notable exception of the omega 3 fatty acids, have so far produced conflicting or negative results. In other words, our science appears to have no predictive value. Does this invalidate the science? Or are we simply asking the wrong questions?

Based on pharmaceutical thinking, most intervention studies have attempted to measure the impact of a single micronutrient on the incidence of disease. The classical approach says that if you give a compound formula to tests subjects and obtain positive results, you cannot know which ingredient is exerting the benefit, so you must test each ingredient individually. But in the field of nutrition, this does not work. Each intervention on its own will hardly make enough difference to be measured. The best therapeutic response must therefore combine micronutients to normalise our internal physiology. So do we need to analyse each individual's nutritional status and then tailor a formula specifically for him or her? While we do not have the resources to analyse millions of individual cases, there is no need to do so. The vast majority of people are consuming suboptimal amounts of most micronutreints, and most of the micronutreints concerned are very safe. Accordingly, a comprehensive and universal program of micronutrient support is probably the most cost-effective and safest way of improving the general health of the nation.

111. Type-B malnutrition is a serious concern in developed countries because

1. Developing countries mainly suffer from Type-A malnutrition.
2. It is a major contributor to illness and death.
3. Pharmaceutical companies are not producing drugs to treat this condition.
4. National surveys on malnutrition do not include newer micronutrient groups.

112. Why are a large number of apparently healthy people deemed pre-ill?

1. They may have chronic degenerative diseases.
2. They do not know their own genetic risks factors which predispose them to diseases.
3. They suffer from Type-B malnutrition.
4. There is a lengthy latency period associated with chronically degenerative diseases.

113. The author recommends mironutrient-repletion for large-scale treatment of chronic degenerative diseases because.

1. It is relatively easy to manage.
2. Micronutrient deficiency is the cause of these diseases.
3. It can overcome genetic risk factors.
4. It can compensate for other lifestyle factors.

114. Tailoring micronutrient-based treatment plans to suit individual defiency profiles is not nesasary because

1. It is very likely to give inconsistent or negative results.
2. It is a classic pharmaceutical approach not suited to micronutreints.
3. Most people are consuming suboptimal amounts of safe-to-consume micronutreints.
4. It is not cost effective to do so.

PASSAGE V

Fifty feet away three male lions lay by the road. They didn't appear to have a hair on their heads. Noting the color of their noses (leonine noses darken as they age, from pink to black), Craig estimated that they were six years old—young adults. "This is wonderful!" he said, after staring at them for several moments. "This is what we came to see. They really are maneless." Craig, a professor at the University of Minnesota, is arguably the leading expert on the majestic Serengeti lion, whose head is mantled in long, thick hair. He and Peyton West, a doctoral student who has been working with him in Tanzania, had never seen the Tsavo lions that live some 20 miles east of the Serengeti. The scientists had partly suspected that the maneless males were adolescents mistaken for adults by amateur observers. Now they knew better.

The Tsavo research expedition was mostly Peyton's show. She had spent several years in Tanzania, compiling the data she needed to answer a question that ought to have been answered long ago: Why do lions have manes? It's the only cat, wild or domestic, that displays such ornamentation. In Tsavo she was attacking the riddle from the opposite angle. Why do its lions not have manes? (Some "maneless" lions in Tsavo East do have partial manes, but they rarely attain the regal glory of the Serengeti Lions'.) Does environmental adaptation account for the trait? Are the lions of Tsavo, as some people believe, a distinct subspecies of their Serengeti cousins?

The Serengeti lions have been under continuous observation for more than 35 years, beginning with George Schaller's pioneering work in the 1960s. But the lions in Tsavo, Kenya's oldest and largest protected ecosystem, have hardly been studied. Consequently, legends have grown up around them. Not only do they look different, according to the myths, they behave differently, displaying greater cunning and aggressiveness. "Remember too," Kenya: The Rough Guide warns, "Tsavo's lions have a reputation of ferocity." Their fearsome image became well-known in 1898, when two males stalled construction of what

is now Kenya Railways by allegedly killing and eating 135 Indian and African labourers. A British Army officer in charge of building a railroad bridge over the Tsavo River, Lt. Col. J. H. Patterson, spent nine months pursuing the pair before he brought them to bay and killed them. Stuffed and mounted, they now glare at visitors to the Field Museum in Chicago. Patterson's account of the leonine reign over terror, The Man-Eaters of Tsavo, was an international best-seller when published in 1907. Still in print, the book has made Tsavo's lions notorious. That annoys some scientists. "People don't want to give up on mythology," Dennis King told me one day. The zoologist has been working in Tsavo off and on for four years. "I am so sick of this man-eater business. Patterson made a helluva lot of money off that story, but Tsavo's lions are no more likely to turn man-eater than lions from elsewhere."

But tales of their savagery and wiliness don't all come from sensationalist authors looking to make a buck. Tsavo lions are generally larger than lions elsewhere, enabling them to take down the predominant prey animal in Tsavo, the Cape Buffalo, one of the strongest, most aggressive animals of Earth. The buffalo don't give up easily: They often kill or severely injure an attacking lion, and a wounded lion might be more likely to turn to cattle and humans for food.

And other prey is less abundant in Tsavo than in other traditional lion haunts. A hungry lion is more likely to attack humans. Safari guides and Kenya Wildlife Service rangers tell of lions attacking Land Rovers, raiding camps, stalking tourists. Tsavo is a tough neighbourhood, they say, and it breeds tougher lions.

But are they really together? And if so, is there any connection between their manelessness and their ferocity? An intriguing hypothesis was advanced two years ago by Gnoske and Peterhans: Tsavo lions may be similar to the unmanned cave lions of the Pleistocene. The Serengeti variety is among the most evolved of the species—the latest model, so to speak—while certain morphological differences in Tsavo lions (bigger bodies, smaller skulls, and maybe even lack of a mane) suggest that they are closer to the primitive ancestor of all lions. Craig and Peyton had serious doubts about this idea, but admitted that Tsavo lions pose a mystery to science.

115.   The book *Man-Eaters of Tsavo* annoys some scientists because

1.   It revealed that Tsavo lions are ferocious.
2.   Patterson made a helluva lot of money from the book by sensationalism.
3.   It perpetuated the bad name Tsavo lions had.
4.   It narrated how two males Tsavo lions were killed.

116.   According to the passage, which of the following has NOT contributed to the popular image of Tsavo lions as savage creatures?

1.   Tsavo lions have been observed to bring down one of the strongest and most aggressive animals—the Cape buffalo.
2.   In contrast to the situation in traditional lion haunts, scarcity of non-buffalo prey in the Tsavo makes the Tsavo lions more aggressive.
3.   The Tsavo lion is considered to be less evolved than the Serengeti variety.
4.   Tsavo lions have been observed to attack vehicles as well as humans.

117.   The sentence which concludes the first paragraph, "Now they knew better", implies that:

1.   The two scientists were struck by wonder on seeing maneless lions for the first time.
2.   Through Craig was an expert on the Serengeti lion, now he also knew about the Tsavo lions.
3.   Earlier, Craig and West thought that amateur observers had been mistaken.
4.   Craig was now able to confirm that darkening of the noses as lions aged applied to Tsavo lions as well.

118. Which of the following, if true, would weaken the hypothesis advanced by Gnoske and Peterhans most?

1. Craig and Peyton develop even more serious doubts about the idea that Tsavo lions are primitive.
2. The maneless Tsavo East lions are shown to be closer to the cave lions.
3. Pleistocene cave lions are shown to be far less violent than believed.
4. The morphological variations in body and skull size between the cave and Tsavo lions are found to be insignificant.

Sub – Section III – B
Number of Questions = 5

Note: Questions 119 to 123 carry two marks each.

DIRECTIONS *for Questions 119 and 120: The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.*

119.

A. Experts such as Larry Burns, head of research at GM, reckon that only such a full hearted leap will allow the world to cope with the mass motorisation that will one day come to China or India.

B. But once Hydrogen is being produced from biomass or extracted from underground coal or made from water, using nuclear or renewable electricity, the way will be open for a huge reduction in carbon emissions from the whole system.

C. In theory, once all the bugs have been sorted out, fuel cells should deliver better total fuel economy than any existing engines.

D. That is twice as good as the internal combustion engine, but only five percentage points better than a diesel hybrid.

E. Allowing for the resources needed to extract hydrogen from hydrocarbon, oil, coal or gas, the fuel cell has an efficiency of 30%.

    1. CEDBA   2. CEBDA   3. AEDBC   4. ACEBD

120.

A. But this does not mean that death was the Egyptians' only preoccupation.

B. Even papyri come mainly from pyramid temples.

C. Most of our traditional sources of information about the Old Kingdom are monunments of the rich like pyramids and tombs.

D. Houses in which ordinary Egyptians lived have not been preserved, and when most people died they were burried in simple graves.

E. We know infinitely more about the wealthy people of Egypt than we do about the ordinary people, as most monuments were made for the rich.

    1. CDBAE   2. ECDAB   3. EDCBA   4. DECAB

DIRECTIONS *for Questions 121 to 123:* Four alternative summaries are given below each text. Choose the option that best captures the essence of the text.

121. Although almost all climate scientists agree that the Earth is gradually warming, they have long been of two minds about the process of rapid climate shifts within larger periods of change. Some have speculated that the process works like a giant oven or freezer, warming or cooling the whole planet at the same time. Others think that shifts occur on opposing schedules in the Northern and Southern Hemispheres, like exaggerated seasons. Recent research in Germany examining climate patterns in the Southern Hemisphere at the end of the last Ice Age strengthens the idea that warming and cooling occurs at alternate times in the two Hemispheres. A more definitive answer to this debate will allow scientists to better predict when and how quickly the next climate shift will happen.

  1. Scientists have been unsure whether rapid shifts in the Earth's climate happen all at once or on opposing schedules in different hemispheres; research will help find a definitive answer and better predict climate shifts in future.
  2. Scientists have been unsure whether rapid shifts in the Earth's climate happen all at once or on opposing schedules in different hemispheres; finding a definitive answer will help them better predict climate shifts in future.
  3. Research in Germany will help scientists find a definitive answer about warming and cooling of the Earth and predict climate shifts in the future in the better manner.
  4. More research rather than debates on warming or cooling of the earth and exaggerated seasons in its hemispheres will help scientists in Germany predict climate changes better in future.

122. Modern bourgeois society, said Nietzsche, was decadent and enfeebled – a victim of the excessive development of the rational faculties at the expense of will and instinct. Against the liberal-rationalist stress on the intellect, Nietzsche urged recognition of the dark mysterious world of instinctual desires – the true forces of life. Smoother the will with excessive intellectualising and you destroy the spontaneity that sparks cultural creativity and ignites a zest for living. The critical and theoretical outlook destroyed the creative instincts. For man's manifold potential to be realised, he must forego relying on the intellect and nurture again the instinctual roots of human existence.

  1. Nietzsche urges the decadent and enfeebled modern society to forego intellect and give importance to creative instincts.
  2. Nietzsche urges the decadent and enfeebled modern society to smoother the will with excessive intellectualising and ignite a zest for living.
  3. Nietzsche criticises the intellectuals for enfeebling the modern bourgeois society by not nurturing man's creative instincts.
  4. Nietzsche blames excessive intellectualisation for the decline of modern society and suggests nurturing creative instincts instead.

123. Local communities have often come in conflict with agents trying to exploit resources, at a faster pace, for an expanding commercial-industrial economy. More often than not, such agents of resource-intensification are given preferential treatment by the state, through the grant of generous long leases over mineral or fish stocks, for example, or the provision of raw material at an enormously subsidised price. With the injustice so compounded, local communities at the receiving end of this process have no resource except direct action, resisting both the state and outside exploiters through a variety of protest techniques. These struggles might perhaps be seen as a manifestation of a new kind of class conflict.

1. A new kind of class conflict arises from preferential treatment given to agents of resource-intensification by the state, which the local community sees as unfair.
2. The grant of long leases to agents of resource-intensification for an expanding commercial-industrial economy leads to direct protests from the local community, which sees it as unfair.
3. Preferential treatment given by the states to agents of resource-intensification for an expanding commercial-industrial economy exacerbates injustice to local communities and leads to direct protests from them, resulting in a new type of class conflict.
4. Local communities have no option but to protest against agents of resource-intensification and create a new type of class conflict when they are given raw material at subsidised prices for an expanding commercial-industrial economy.

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ANSWER KEY

1.	3	41.	4	81.	3	121.	2
2.	1	42.	2	82.	2	122.	4
3.	2	43.	1	83.	4	123.	3
4.	1	44.	2	84.	2		
5.	4	45.	1	85.	2		
6.	2	46.	3	86.	3		
7.	1	47.	2	87.	3		
8.	4	48.	1	88.	4		
9.	4	49.	3	89.	3		
10.	3	50.	4	90.	2		
11.	1	51.	4	91.	1		
12.	4	52.	3	92.	4		
13.	4	53.	4	93.	1		
14.	1	54.	3	94.	4		
15.	3	55.	2	95.	2		
16.	2	56.	2	96.	2		
17.	2	57.	2	97.	1		
18.	2	58.	3	98.	2		
19.	1	59.	4	99.	4		
20.	4	60.	2	100.	2		
21.	3	61.	3	101.	1		
22.	2	62.	2	102.	2		
23.	4	63.	1	103.	3		
24.	1	64.	3	104.	3		
25.	1	65.	3	105.	1		
26.	1	66.	3	106.	1		
27.	2	67.	3	107.	4		
28.	1	68.	2	108.	1		
29.	3	69.	4	109.	4		
30.	2	70.	2	110.	3		
31.	4	71.	1	111.	2		
32.	4	72.	1	112.	4		
33.	3	73.	4	113.	1		
34.	3	74.	3	114.	3		
35.	1	75.	1	115.	3		
36.	4	76.	4	116.	3		
37.	3	77.	1	117.	3		
38.	3	78.	2	118.	3		
39.	4	79.	1	119.	1		
40.	1	80.	4	120.	3		

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EXPLANATIONS

1.	Canada (C) ; Netherlands(N) ; India (I) ; UK (UK) ; USA (U)

University	1	2	3	4
	-	C/UK	X	X
	N/I	-	N	X
	N/I	-	X	X
	-	C/UK	X	UK
	N/I	-	X	X

5	6	7	8
-	X	C/UK	X
N/I	X	-	X
N/I	X	-	I
-	X	C/UK	X
N/I	U	-	X

*Day 2,3 From Country table you can fix university 3,4,6,8. *US can't be in 1 or 5 because it is in 6.

2.	Option 1.
3.	University 4 belongs to UK and exactly one of the other two universities 2 or 7 definitely belongs to UK and the other belongs to Canada. Thus in either case the students from two universities visited the page.
4.	As for 4 of the universities the countries are already decided in the table. Out of the remaining 4 universities ; 1 or 5 belong to either Netherlands or India one each. The remaining two universities i.e. 2 or 7 belong to either Canada or UK one each. Thus the total universities belonging to any country cannot be more than 2. Thus None i.e. the first option.
5.	Leaving Japan & Malaysia, rest all show maximum dissimilarity.
6.	Among the options in Japan, D has been ranked first compared to its rank 5th under India. That is the maximum difference. Hence Japan.
7.	Leaving China rest all countries at least show a dissimilarity difference of 2.
8.	Again in the countries Thailand & Japan , D has been ranked 5th and 1st respectively.
9.	Simple visual observation. The minimum of Dubey and maximum of Dubey ,both are higher than the respective values of other families.
10.	Similarly we can conclude that Coomar family will have the lowest average income because all the three values are comparatively lesser in total.
11.	Highest income and lowest expenditure is shown by a member of the Ahuja family.
12.	A bit lengthy if you start calculating but if visual observation with a certain amount of reasoning is applied, you will easily locate Dubey family, as the income and expenditure in the Dubey family's case is almost same, thus it will have the lowest savings. That you can also judge from the middle line that represents income = expenditure. Thus 4th option.
13.	Aggregate of grades of tara:-$(4+x+x+x+y)/5 =2.4 \times 5 = 12$. The question also states that the person has the same score in exactly three of the subjects. Now if one of the subjects has 4 marks, this means from the remaining 4 subjects, we have to get a score of 8 marks. If you take the three same subjects to have 2, 2, 2 then the fourth also becomes 2, but the questions states exactly three thus i.e.

	not possible. Now the only possibility remains is that Tara must have received the same marks in the two subjects as she has got in Finance i.e. 4 marks. Thus she has three B grades and two F grades. Now to answer the question, out of the four options given neither Ismet, nor Hari nor Jagdeep has B or F grade in operations. Only Manab has B grade and he could have the same grade as Tara. Thus 4th option.
14.	$0+2+2+x+y = 16$ i.e $x+y = 12$ hence $x = y = 6$. Hence Grade A.
15.	Fazal obtained B grade in strategy, so Utkarsh also gets B grade in marketing.Now from here we can calculate that Utkarsh would have obtained D grade in Finance.
16.	We can calculate that Gowri gets C grade in strategy. Now Hari has scored only 2 points from strategy and finance combined. Hence it is Hari.
17.	20% of newly bought grinder is disposed off in 2 years exactly. Therefore, 20% of 30(1997) and 20% of 50 (1998 i.e 80-30) = 16.
18.	It will be the difference in the operational grinders plus the grinders being disposed off in that year. Hence , 44 + 6 = 50.
19.	10 were disposed in 1997, so the newly added were in 1997 were 30. Therefore 6 will be discarded in 1999. Hence the total newly added is 6+14 = 20.
20.	Because we do not have the data about how many grinders were disposed off in 1996 ,we can not calculate the newly added of that year and so we can not calculate the disposal of 1998 and hence so for the year 2000.
21.	Incorporating both the statements :- 1) 2P + 1G < 1P + 2 G …From this G> P 2) 1P + 2 O = 1 O + 2 G ; P + O = 2G => G = P + O /2, …From this O > G Hence O is the greatest.
22.	If we use the first statement then in 21 coin throws there can be a possibility that there are 10 H and 10 T and the last can be a head or tail. There is another possibility of 12 T and 9 H. So first statement cannot give the answer. Out of these two possibilities, first cannot be true as in that case the net result is either one head extra or one tail extra. But with one extra head or tail he cannot reach at either end. Considering the second possibility, he can go additional 3 tails, means he should have reached at the blue mark. From the second statement, when we incorporate 2nd statement we can always be sure that man will be at the blue mark.
23.	With the given data nothing can be concluded. Using the first statement, we can conclude that 7 notes of 5 & 10 were used combined and 6 notes of 1 & 2 were used combined. Price is a multiple of 10 hence there has to be 4 (2 rupee) & 2(1 rupee) notes to make it 10. In the first group of 5 & 10 rupee notes, various possibilities can arise for example:- 2(5 rupee) or 4 (5 rupee) or 6(5 rupee) etc. , which will result in different prices.
24.	Using the first statement , lets assume A B C D are the four people with A having the highest score, B the second best , C third and D least. Then A will vote B, B will vote A, C will also vote A. In case if D votes B still with the tie A will win because of better score. Hence first statement is sufficient to answer.
25.	Statement 1 doesn't give any useful information .But looking at the statement 2 ,we can say that when 3 boys

	were on the top 5 and rashmi was 3rd among the girls and we also know that in overall rank kumar secured 6th .Therefore Kumar is ranked higher than Rashmi.
26.	From I st Statement , 20 % of Zakib > 25% of Supriyo, So 30% of Zakib > 37.5% of Supriyo, hence cannot comment anything From the second statement we know that 13% of Supriyo > 10 % of Zakib. Hence 39% of S > 30% of Z .and supriyo spends 40 % on education which will definitely be higher.
27.	In this question we can not find the M-index of Virender and yuvraj conclusively .So among Rahul and Sourav , Saurav will have a higher M-index for sure of 50 compared to Rahul's 49.
28.	First let us calculate the complete data. 1)Pakistan :- 90% is 198 .Therefore total against Pakistan is 220. Hence the other two batsman(R & S) could have scored 22 together. 2)South Africa :- 70% is equal to 175. Therefore total is 250 and 75 has been scored by (V & Y). 3)Australia :- 80% is 192 .Hence total is 240 and 48 has been scored by the other two batsmen (K & V). R- index is difference between maximum and minimum. We are looking for lowest R-index possible. Scores of kaif : 28, 51 and between 0-48 against Australia.Mimimum R-index for kaif is possible when his score against Australia is also 28 making the R-index to be 22.If he scores 0 against Australia then the R-index is 51. For Rahul:- 49,55 and between 0-22 against Pakistan.So minimum he scores against Pakistan anywhere between 0-22.Lets assume he scores maximum 22 ,still his R-index will be 55-22 = 33 and if he scores 0 then 55. Similarly yuvraj's R-index varies between 47-87 . Hence any of these three can have minimum R-index.
29.	M-index can be calculated only for two players :- S- 50 & R 49.
30.	Lets say Yuvraj scored 0 against south Africa.Then his total is 127. V can never be lesser. K-28 + 51 + 48(Australia assumed) =127 .So can not say. S – 75 + 50 + 0-22(Pakistan) .Might be,might not be.Cannot say. R- 49 + 55 + 0-22(Pakistan) .Even if he scores maximum 22 the total is 126 which is less than yuvraj's minimum possible score of 127. Hence we can be sure about only Rahul.
31.	You can see out of the four options given, all have been determined except the 4th option because it could be one or two; hence 4th option is the answer.
32.	See the 4th option, if both America and Africa have one expert in population studies, then the no. of experts in population studies remain 5 only, but it is given to be 6. Thus one out of these two continents have to provide 2 experts of population studies, hence 4th option is the answer.
33.	From statement (a) let the no. of labour experts be x, then the no. of experts in the other categories will be 2x each. Now $x + 2x + 2x + 2x = 21 \Rightarrow x = 3$. Thus labour experts are 3 and experts in other three categories are 6 each. From statement (d) if one less Australasian expert is there, then let the experts from America be 2y and then the experts from each of the other four continents will be y each. Now as in this case one expert from Australasia is taken less hence the total no. of remaining experts becomes 20. Therefore $y + y + y + 2y = 20 \Rightarrow y = 4$. This implies experts from America are $4 \times 2 = 8$ and experts from Australasia are $4 + 1 = 5$ (because one was subtracted initially). The experts from the remaining two continents are 4 each. Now these inferences and from the other information provided a table can be made as given below.

Continent	Expert In	Labour	Health
	Africa	0	At least 1*
	America	1	At least 1$^{\$}$
	Australasia	1	1
	Europe	1	1
	Total	**3**	**6**

Population Studies	Refugee Relocation	Total
At least 1*	At least 1*	4
At least 1$^{\$}$	At least 1$^{\$}$	8
1 + 1 (given Mike & Alfans)	1	5
1	1	4
6	**6**	21

It can seen that four Americans and one African are still there to be allotted in various expertise areas and out of those five persons, two are to be put in Health, one is to be put in Population studies and two are to be put in Refugee relocation. *It can be seen from the table that one more expert is there from Africa which will be put in one of the three categories except Labour. $ It can be further seen from the table that there are 4 more experts from America, which will be put in three categories of Health, Population Studies and Refugee Relocation as per the information given in the further questions, with a condition of maximum limit being 3 from any continent to a particular area.

Now each of the questions is to be taken. independently.

If Ramos is the lone American expert in Population, this implies the remaining four experts from America have to be put two each in Health and RR. Thus in totality there will be three experts in these areas from America, thus 3rd option is not true.

34.	Out of the four Americans, if you try to put them in other areas except refugee relocation even then only 3 persons (two in health and one in population) can be allotted i.e. at least one person from America besides Alex is minimum there. On the higher side it can be maximum two because a maximum of three persons can be taken from a continent for any particular area. Thus 3rd option is the answer
35.	**Table – I.** The table giving about the 1st two rounds

Team	Goals For	Goals Against	First Round	Second Round	Points
Germany	3	1	(1,0)	(2,1)	6
Argentina	2	0	(1,0)	(1,0)	6
Spain	5	2	(0,1)	(5,1)	3
Pakistan	2	1	(2,0)	(0,1)	3
New Zealand	1	6	(0,1)	(1,5)	0
South Africa	1	4	(0,2)	(1,2)	0

Results of the first two rounds:

Germany beat Spain and South Africa by (1, 0) and (2, 1) respectively.

Spain beat New Zealand by (5, 1) and lost to Germany by (0, 1).
Argentina beat New Zealand and Pakistan by (1, 0) and (1, 0) respectively.
Pakistan beat South Africa by (2, 0) and lost to Argentina by (1, 0).

Results of the third round:

The third round matches played were Spain Vs Pakistan, Germany Vs New Zealand and Argentina Vs South Africa which were all draws.
Table – II

The table gives the information about the 4th and the 5th rounds

Games Played	Won	Lost	Won Against	Lost to
2	1 (3, 0)	1	Argentina	Pakistan
2	-	2	-	Spain, Ge
2	2	-	Argentina, South Africa	-
2	2 (1, 0) and (1, 0)	-	New Zealand, Germany	-
2	-	2		Pakistan, Africa
2	1 (3,0)	1	New Zealand	Spain

Refer Table I – **Option 1.** (1st Round)

36. Refer Table I – **Option 4.**

37. If we go by options, taking 1st option as Argentina, we can see that the total points scored by Argentina are 6(1st 2 rounds) + 1(3rd round) + 0 (4th and 5th rounds) = 7. Similarly we can see that the total points scored by Germany are 6(1st 2 rounds) + 1(3rd round) + 3 (4th and 5th rounds) = 10. And we can see that the total points scored by Spain are 3(1st 2 rounds) + 1(3rd round) + 6 (4th and 5th rounds) = 10. So Argentina is out of race. Now we have to consider the goal difference of Germany and Spain. For Germany:
Goals for: 3(1st 2 rounds) + 0 (4th round) + 3 (5th round) = 6.
Goals against: 1(1st 2 rounds) + 1(4th round) + 0 (5th round) = 2. Hence goal difference = 4.
Now for Spain:
Goals for: 5(1st 2 rounds). Goals against: 2(1st 2 rounds). This is giving a goal difference of 3. But since Spain has won both its 4th and 5th round matches, so there has to be a minimum goal difference of 1 in both the matches. So goal difference in case of Spain has to be at least 5. So Spain must have been the other team that qualified. So answer is 3rd option.

38. As per the explanation given for the previous question, we can see that Argentina is out of race. We have considered the cases of Germany and Spain as well. Now we look into the case of Pakistan. Total points scored by Pakistan are 3(1st 2 rounds) + 1(3rd round) + 6 (4th and 5th rounds) = 10. So we have to look for goal difference of Pakistan.
For Pakistan:
Goals for: 2(1st 2 rounds) + 1 (4th round) + 1 (5th round) = 4.
Goals against: 1(1st 2 rounds) + 0(4th round) + 0 (5th round) = 1. Hence goal difference = 3. Since it is less than the minimum goal difference of Spain, hence Spain must

have finished at the top of the pool after five rounds of matches. So answer is 3rd option

39.
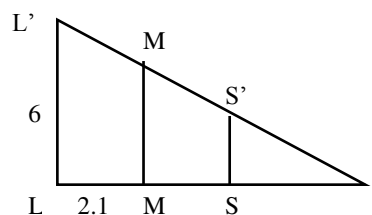
In the above diagram, MM' = 1.8 and SS' = 0.9. It can be shown that the three triangles, TLL', TMM' and TSS' are similar to each other. In triangles TSS' and TMM', SS'/MM' = TS/TM = 0.9/1.8 = ½. So, TM = 2TS. In triangles TMM' and TLL', MM'/LL' = TM/TL = 1.8/ 6. Substituting for TL = 2TS + 2.1 and solving yields TS = MS = 0.45.

40. The milkman has 100 litres of mixture. When he sells 25 litres of the mixture, he is removing ¼ of the milk and ¼ of the water in the original mixture. So, he is left with 15 litres of water and 60 litres of milk. He now adds 25 litres of water to the mixture. The new mixture will now contain (15 + 25) = 40 litres of warer and 60 litres of milk. Thus, the required ratio is 2 : 3.

41. In a 100 metres race, when Karan runs 100 metres, Arjun runs 90 metres. Since time is constant, the ratio of distances is equal to the ratio of speeds. So, the ratio of speeds of Karan and Arjun is 100 : 90 = 10 : 9. In the second case, Karan will have to run 110 metres to complete the race. In this case, the ratio of distances traveled will be equal to the ratio of speeds 10 : 9. So, when Karan runs 110 metres, Arjun will run (110 x 9)/10 = 99 metres, i.e., he needs to cover 1 metre to complete the race.In other words, Karan beats Arjun by 1 metre.

42. This problem is the same problem as finding the number of diagonals of a n-sided polygon, stated in different words. We know that the number of diagonals is $^{n}C_2$ – n. So n is simply calculated by $^{n}C_2$ – n = 28 / 2 = 14. Check with the options it fits for n = 7.
(None of the other options is a divisor of 14.)

43. If the first 11 terms have the same sum as the first 19 terms, then the sum of terms 12 to 19 (8 terms) must be zero. This means that the 15th term is just negative and 16th term is just positive – or vice-versa.
Or that zero lies between the 15th and the 16th terms. For 30 terms, 15 will be negative and 15 will be positive. So their sum will be zero.

44. Suppose the distance the man travels is D km and he takes time T hours when he travels at 10 kmph. When he travels at 15 kmph he travels in (T – 2) hours. So, D = 10T = 15(T – 2). Solving for T gives T = 6 hours. If he reaches at 1:00 p.m., he must have left 6 hours earlier, i.e., at 7 a.m. If he wants to reach at 12 noon, he must cover the distance D in 5 hours. So, D = 10 x 6 = 5S or S = 12 kmph.
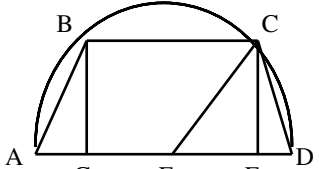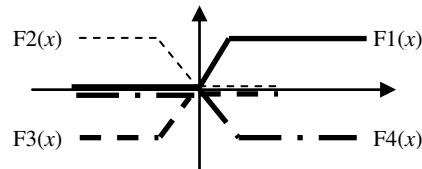
45. If there are n members in S_1 in January and b members are added each month, then in July, there are $n + 6b$ members. If there are n members in S_2 in January, then there are nr^6 members in July. Since the number of members in S_1 and S_2 in July is the same, $n + 6b = nr^6$. Substituting for $b = 10.5n$, we get $64n = nr^6$ or $r^6 = 64$. Solving this equation yields $r = 2$.

46. If $x = y = 0$, then $x + y = xy = 0$. Also, if $x = y = 2$, then $x + y = xy = 4$.

47. Substitute the values of x to get f(0) = p and f(1) = p – 3. Now if f(0) and f(1) are of the opposite signs, then f(0) is positive, and f(1) is negative.
This will happen if p is more than 0 and less than 3.

48.	The number n is greater than 10,000,000,000. Since the sum of the digits is 2, one of the above zeroes will be replaced by 1. This can happen in 10 ways. And one of no. made can be 20,000,000,000, which can happen in only one way. Thus the total no. of numbers made will be 11, which is given in 1st option.
49.	If a = b = c= 1, then we get r as 1 / (1 + 1) = ½ If a = 2, b = -1 and c = -1, then we get r as 2 / (-1 – 1) = -1. There are no other values which r can take.
50.	The function y is a recursive one $y= \dfrac{1}{2 + \dfrac{1}{3 + y}}$ $y = \dfrac{3 + y}{7 + 2y}$ $2y^2 + 6y - 3 = 0$ on solving we get $\dfrac{-3 \pm \sqrt{15}}{2}$ As y is a positive number so $\dfrac{\sqrt{15} + 3}{2}$ is the answer
51.	If a is greater than zero and b is less than zero, then the term f(x) will always be positive. The minimum value of a positive function is zero, which is the value that f(x) takes for x = 0.
52.	The relative speeds of the boats is 15 km / h. In one minute the distance would be 15 / 60 = 1/4 km.
53.	Start from the minimum possible option, if the no. of families happen to be 2, then the maximum no. of adults possible is 4 and the minimum no. of children are 6 (3 for each family). Now if the six chidren are broken among boys and girls so that the boys are more than girls than their no. become 4 and 2. In that case the adults and boys become equal, which breaks the condition given in the question and is thus wrong. If boys and girls are taken to be 3 and 3, then the condition specifying that boys are more than girl is broken. Taking the second lowest option 3, the maximum no. of adults become 6 and minimum no. of chidren become 9, which can be breakon as 5 boys and 4 girls. Now 6 > 5 > 4 > 3 i.e. adults > boys > girls > families. Thus 4th option is becomes the answer.
54.	**Machine I:** Number of nuts produced in one minute = 100 To produce 1000 nuts time required = 10 min Cleaning time for nuts = 5 min Over all time to produce 1000 nuts = 15 min. Over all time to produce 9000 = 138 min - 5 min = 133 min … (1) **Machine II:** To produce 75 bolts time required = 1 min To produce 1500 bolts time required = 20 min Cleaning time for bolts = 10 in. Effective time to produce 1500 bolts = 30 min Effective time to produce 9000 bolts = 30 × 6 - 10 = 170 min … (2) From (1) and (2) Minimum time = 170 minutes
55.	Let the longer side have side 2x. The shorter side has length 2. So original ratio of long : short side is 2x : 2 or x : 1. After folding the original long side becomes 2x / 2 = x. The new ratio is 2 : x This is equal to x : 1 Equating we get x / 1 = 2 / x ; x = √2

	The area of the smaller rectangle is 2x = 2√2.
56.	Take the radii of the circles as 3x and 4x. Distance PQ is 7x. Considering similar triangles PSQ and OPR, we can say that SQ / OQ = PR / OP 3x / OQ = 4x / 28, Or OQ = 21. This gives us the value of PQ as OP – PQ = 28 – 21 = 7. But this is also equal to sum of the 2 radii = 3x + 4x = 7x. That means 7x = 7, x = 1, or the radii are 3 and 4. For q. 56 : The ratio is 7 : 21 = 1 : 3
57.	Refer above
58.	Triangle OQS has two sides 21 and 3. So the third side will be √ ($21^2 – 3^2$) = 12√3
59.	Angle CBE is 65°. So angle COE will be double of that = 65*2 = 130. Now triangle COE is an isosceles triangle, with the radii forming the two sides. So angles OCE and CEO (call them both x) are equal. 2x + 130 = 180, x = 25 Since AC and ED are parallel, angle DEC will also have value x = 25 degree.
60.	In the above figure, let E be the centre of the semi-circle and CF ⊥ AD and BG ⊥ AD. The radius of the semi-circle = ED = EC = 4. Using the semi-perimeter formula, A(ΔCED) = √15. But, A(ΔCED) = ½ x ED x CF. So, CF = √15/2. In ΔCFD, Using Pythagoras theorem, $FD^2 = CD^2 – CF^2 = 4 – (√15/2)^2$. So, FD = 0.5. Since ABCD is an isosceles trapezium, AG = FD = 0.5. So, BC = GF = 8 – 0.5 – 0.5 = 7.
61.	The problem becomes very simple if we plot the graphs of each of the curves. We can now see easily that f1(x)f2(x) will always be zero, because for positive x, f2(x) is zero and for negative x, f1(x) is 0. Also, for positive x, f2(x) is zero and for negative x, f4(x) is 0. So their product is also zero.
62.	Check the options for the following x values, -2, -1, 0, 1 and 2, you can conclude that option 2 is true.
63.	If group B contains 23 questions, then there are 46 marks for group B. Now start plugging in the options. If C = 1, then marks for group C is 3. Group A will have (100 – 23 – 1) = 76 questions. Total marks of the test will be 76 + 46 + 3 = 125. We now need to check if in this case A carries 60% weightage or not. 76/125 > 60%, but just about. Even if C becomes 2, then it is going to drop. So answer is c = 1.
64.	C has 8 questions and 24 marks. Let B have 13 questions, so no of marks is 26 So A will now have 100 – 13 – 8 = 79 questions and 79 marks. Total marks in this scenario is 79 + 24 + 26 = 129. Now we check the two conditions. Is B > 20 %. At 26 / 129, it is just about. Is A > 60%. At 79 / 129, it is just about. If B drops by even 1 question, condition of B > 20% is going to be violated. So answer is 13 or 14.
65.	The circumference of the ground is 2πr. In 0.5 min distance covered is πr / 2 In 1 min distance covered is 1 * πr / 2 = πr / 2

	In 2 min distance covered is $2 * \pi r / 4 = \pi r / 2$ In 4 min distance covered is $4 * \pi r / 8 = \pi r / 2$ So in total of 7.5 min, a distance of $4*\pi r / 2 = 2\pi r$ or 1 round is covered. Time taken to cover the next round will be $8 + 16 + 32 + 64 = 120$ minutes. So ratio of times taken is $120 / 7.5 = 240 / 15 = 16 : 1$ This is the ratio of times for the second and first round, but it will be the same for any two successive rounds.
66.	Using the values of a_1, a_2 and the expression for a_j, the given series is 81.33, -19, -100.33, -81.33, 19, 100.33, 81.33, -19, ….. When the terms of this series are added, it is seen the the sum of every 6 terms, i.e., terms $1 – 6$, terms $7 – 12$, terms $13 – 18$, and so on, is 0. The sum of the first 6002 terms is the same as the sum of 1000 sets of 6 terms and the last two terms. The last two terms are 81.33 and –19. Since the sum of each set of 6 terms is 0, the sum of the first 6002 terms is $(1000 \times 0) + 81.33 – 19 = 62.33$.
67.	Any $a^3 + b^3$ will always be divisible by $a + b$. So $15^3 + 23^3$ will always be divisible by $15 + 23 = 38$. Anything that is divisible by 38, will be divisible by 19.
68.	In order to reach point B from point A, we have to take 3 North steps and 5 West steps. Any path, say for eg, the corner path N N N W W W W W is an arrangement of these 3 Ns and 5 Ws. A total of $8! / (3! * 5!)$ arrangements are possible.$= 56$
69.	Let us assume that the outer circle had a radius = 8. So circle C1 will have a radius = 2. Circle C2 will have a radius = 1. Circle C3 will have a radius = 1 / 2 Sum of areas of C1, C2, C3… is $4 + 1 + 1 / 4 + ….$ So this is equal to $4 / (1 – 1 / 4) = 16 / 3$ Original circle's area is $8^2 = 64$. Unshaded area to total area is $(64 – 16 / 3) / 64. = (1 – 1 / 12) = 11 / 12$
70.	We need to check with different values of x. If $x = 2$, $u = 1 – 6 + 12 = 7$. 2^7 is not 256. If $x = 4$, $u = 4 – 12 + 12 = 4$. 2^4 is 256. So the unique solution is $x = 4$.
71.	The color for the first strip has 4 choices. Subsequently we have 3 choices for each of the strips. So total no. of choices is $4 * 3^5 = 12 * 81$, hence 1st opt
72.	Suppose S is the side of the cube. Then, $DF = AG = CE = S\sqrt{3}$, since these are the longest diagonals of a cube. These three diagonals are the sides of an equilateral triangle. In an equilateral triangle, the circumradius is $(1/\sqrt{3})$ times the side. So, the circumradius of the equilateral triangle is $(1/\sqrt{3})(S\sqrt{3}) = S$.
73.	Consider the square made by the two radii and the tangents to the circle which form the right triangle. It will have a diagonal of length $– 2\sqrt{2}$. The point where the diagonal is intersected by the circle is at a distance equal to $2\sqrt{2} – 2$ from the vertex of the two walls. Let the radius of the small circle be r. Now the above distance is also equal to $r + r\sqrt{2}$ So $r + r\sqrt{2} = 2\sqrt{2} – 2$ Or $r = (2\sqrt{2} – 2) / (\sqrt{2} + 1)$ $= (2\sqrt{2} – 2) / (\sqrt{2} + 1) * (\sqrt{2} – 1) / (\sqrt{2} – 1)$ $= (2\sqrt{2} – 2) * (\sqrt{2} – 1) / (2 – 1) \Rightarrow 6 – 4\sqrt{2}$.
74.	If a place is as peaceful as a resort hotel out of season, the corridors cannot be anything but *empty*. *Hollow* is ruled out because we most often use it in the sense of importance of something. For a physically vacant place, the preferred word is *empty*.
75.	If people talk to each other in low-pitched voices, they cannot be *stentorian* or *loud* (the two are synonyms). *Faded* is out of question because it does not make any sense.
76.	If a person is led into scowling, his temper has obviously been set off.
77.	Both *strolled* and *stormed* need some preposition to make
	them meaningful. So they are ruled out. *Prowled* will not make sense in this context.
78.	The statement given is neither *devious* (indirect) nor *tactful*. Between *blunt* and *pretentious*, the former is definitely better because it implies the idea of lack of tact or grace over not having done one's due.
79.	The dues will increase with the accumulation of interest over unpaid amount and fines imposed thereon. Obviously, taxes are not imposed on unpaid taxes nor is principal in any way related to accumulation of dues.
80.	Normally, bank accounts and royalty funds are attached, i.e. rendered immune from any kind of operation in such cases. *Impounded* is used often in cases involving any physical property like vehicles etc. The words *closed* and *detached* are not meaningful in the present case.
82.	*Smashing* an auto in such a case will yield nothing. *Frozen* too does not make much sense, it is much more applicable to bank accounts etc. *Dismantling* and *seizing* it might yield something of value, but between the two, the dept. will better gain by seizing and selling it rather than dismantling it *per se*. (and selling it in pieces later)
83.	Options 2 and 4 are possible candidates, out of which the latter is the better one because it is a wrong-doer we are talking of, and not a wronged person, which option 2 indicates.
84.	B should have been "… pleaded guilty to ….". D should have been "….sentenced to …."
85.	Sentence C should have read like: "*…... she took a shower....*" Because taking shower means to take the instrument in one's hands.
86.	B should be changed to "…. efforts bore fruit……" C should have read like : "Everyone complimented …..."
87.	Option 1 is superfluous as it is full of many excess words. Option 2 is ungrammatical and so is true of option 4.
88.	*Estimated at* is used in a financial sense, so option 3 is ruled out. Option 1 is ungrammatical and so is opt 2.
90.	The phrase *made a bolt* does not make any sense.
91.	It should have been "…. *pass marks*…."
92.	In the fourth option, the intended meaning of *fallout* is result but the problem is: *fallout* is not used in this sense. Hence the answer.
93.	E is in logical continuation of B. The two neighbours being discussed in A are the two mentioned in D only, therefore D-A is a logical pair.
94.	The combination D-B is given on platter. But we cannot piggyback on it as it is present in all the options. Considerable help is provided by B-A as A certainly serves to amplify the idea given in B. Of the two options 2 and 4, the latter is a bit better because of a good general opening line.
95.	A bit of GK can help you here. Sentence D supports the idea given in line E and E explains B. So B-D-E is a good combination. B is by all accounts, a good opening comment and CA is not at all a logical pair, which leaves us with option 2.
96.	In this and the following question, you are supposed to distill the essence of the paragraph and present the bare soul, without excluding anything essential to the overall meaning. The rest of the choices given lack one or the other thing in terms of meaning, or misrepresent/ distort what is said in the para.
97.	The rest of the choices given lack one or the other thing in terms of meaning, or misrepresent/ distort what is said in the para.
98.	Refer to the last line of the 4th para. The rest of the options are not justifiable in the context of the article.
99.	Refer to the last lines of the 6th and the 4th paras.
100.	Refer to the first line of the 4th para. Even the rest of the examples given support this contention only that in

	reality, the industry has not produced anything radical so far in the name of change.
101.	Last para, read it carefully – the opening comments and the related example.
102.	The second line of the penultimate paragraph hints at this thing only.
103.	Please refer to the 4th line of the very first paragraph.
104.	Please read carefully the 5th para from the top.
105.	Options 2 and 3 are fully justified in the light of the 5th and 6th paras from the top. The 4th option is also justifiable in the light of the 5th paragraph. There is no support whatsoever for option 1.
106.	Refer to para 6, line 1.
107.	Please read the 3rd para carefully.
108.	Refer to the first paragraph.
109.	Refer to the 1st line of the penultimate para.
110.	Please read the 4th para.
111.	Para 3, last few lines
112.	Para 1, last two lines.
113.	Please refer back the last few lines of the 2nd para.
114.	Refer to the lines "there is no need ….." and "…..the vast majority….." from the last paragraph.
115.	Please refer back to the 3rd paragraph. Option 2 is not correct because it is a secondary comment made by another scientist.
116.	Options 1, 2 and 4 indicate their ferocious nature, while 3 does not.
117.	Refer to the last two lines of the very first paragraph.
118.	Options 4 and 2 actually support the hypothesis. Option 1 is based on pure hunch. The Tsavo lions' proposed similarity with the Pleistocene lions implies that the two groups should be alike as possible, but if the difference mentioned in Option 3 is true it obviously creates doubts about the truth of the theory.
119.	E supports the efficiency idea given in C. D is obviously commenting on efficiency. Hence the answer.
120.	C-B make a good pair because both mention pyramids. A is a logical culmination because it contrasts well with the preceding lines.
121.	In option 1, the idea of research giving us definitive answers is unnecessary as it is not supported by the para. Options 3 and 4 are not duly representative of the contents of the paragraph.
122.	Only option 4 captures the meaning in full measure.
123.	Option 3 talks of *exacerbating injustice*, which is the same idea conveyed by *compounded injustice* mentioned in the para. Option 3 is preferable to option 1 because the latter omits many significant details like the protest by the local communities. Option 4 is talking of only raw materials while there are other concessions also.