Cat sample paper 3

INSTRUCTIONS – Please read these carefully before attempting the test
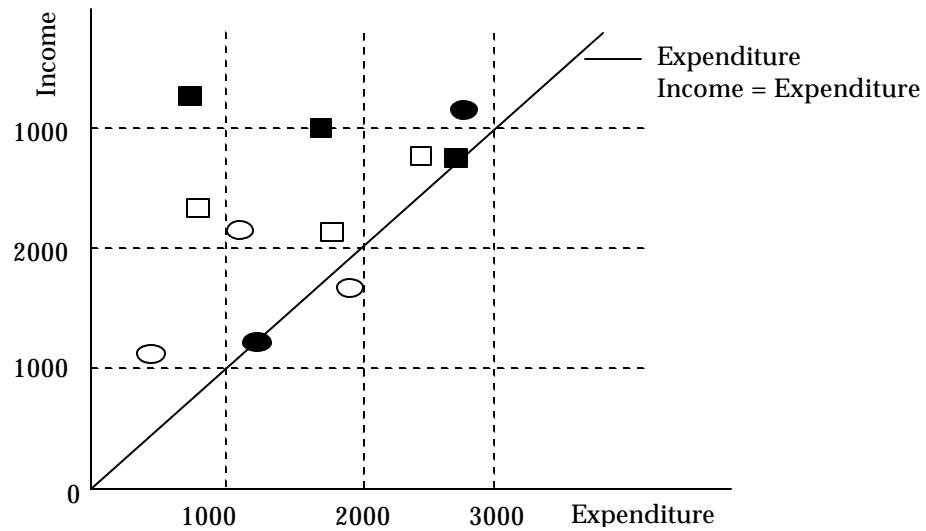
1.   This is based on pattern of previous years CAT papers.

2.   There are three sections.

3.   The total time allotted is 2 hours exactly. Please note your start time and end time on the answer sheet. Do not take more than 2 hours, or you will get a wrong assessment.

4.   Please fill all the details, as asked on top of the answer sheet.

5.   Please try to maximize your attempt overall but you need to do well in all three sections.

6.   Different question carry different marks – some are for ½ marks, some are for 1 mark and some others for 2 marks.

7.   There is negative marking for every wrong answer.

8.   Since it is a time constrained test and you have 2 hour, and all question carry equal marks please do not get struck on any question, but move fast to try and do easier one.

9.   Please do all scratch work on paper only, no extra sheets to be used. Put all your answers on the answer sheet.

10.   Relax. You are competing against yourself.

Note: Questions 1 to 26 carry one mark each.

Directions for Questions 1 to 4: 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 (n), the Bose family (ℓ), the Coomar family--(O), and the Dubey family (l). For these questions, savings is defined as
Savings = Income – Expenditure

1.   Which family has the lowest average income?
        1.Ahuja   2. Bose   3. Coomar   4. Dubey

2.   Which family has the highest average expenditure?
        1. Ahuja   2. Bose   3. Coomar   4. Dubey

3.   The highest amount of savings accrues to a member of which family?
        1. Ahuja   2. Bose   3. Coomar   4. Dubey

4.   Which family has the lowest average savings?
        1. Ahuja   2. Bose   3. Coomar   4. Dubey

Directions for Questions 5 to 8: 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
Urkarsh			F	C	A	3.0
Vipul	A		C	C	F	2.4

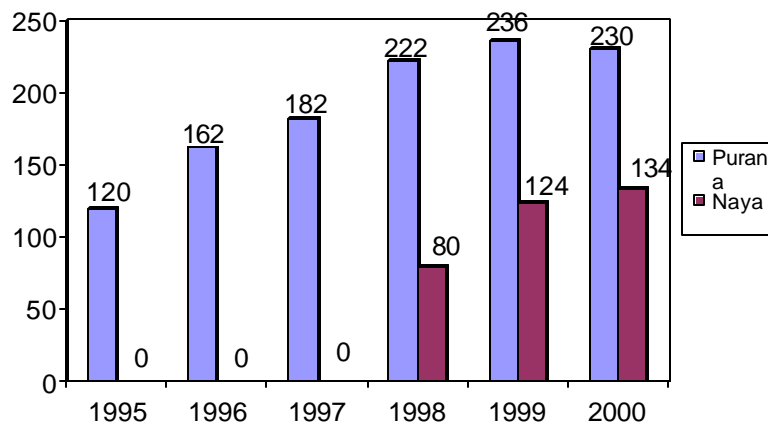In the grading system, A, B, C, D, and F grades fetch 6, 4,3,2, and 0 grade points respectively. The Grade Point Average (GPA) is the arithmetic mean of the grade points obtained in the five subjects. For example Nisha's GPA is $(6 + 2 + 4 + 6 + 0) / 5 = 3.6$.
Some additional facts are also known about the students' 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.

5.   What grade did Preeti obtain in Statistics?
     1.A   2.B   3.C   4.D

6.   In Operations, Tara could have received the same grade as
     1. Ismet   2. Hari   3. Jagdeep   4.Manab

7.	What grade did Utkarsh obtain in Finance?
	1.B	2. C	3. D	4.F

8.	In Strategy, Gowri's grade point was higher than that obtained by
	1.Fazal	2. Hari	3.Nisha	4.Rahul

Directions for Questions 9 to 12: 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.

9.	How many Naya mixer-grinders were purchased in 1999?
	1. 44	2. 50	3. 55	4. 64

10.	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

11.	How many Purana mixer-grinders were purchased in 1999?
	1. 20	2. 23	3. 50	4. Cannot be determined from the data

12.	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 13 to 16: 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 provided him with the following data on the country of origin of the visitors and the university they belong to:

Number of visitors			
	DAY		
COUNTRY	1	2	3
Canada	2	0	
Netherlands	1	1	
India	1	2	
UK	2	0	
USA	1	0	

Number of visitors			
	DAY		
UNIVERSITY	1	2	3
University 1	1	0	0
University 1	2	0	0
University 1	0	1	0
University 1	0	0	2
University 1	1	0	0
University 1	1	0	1
University 1	2	0	0
University 1	0	2	0

13. 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

14. University 1 can belong to
    1.UK   2. Canada   3. Netherlands 4. USA

15. Visitors from how many universities from UK visited Prof. Singh's homepage in the three days?
    1. 1   2. 2   3. 3   4. 4

16. 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 17 to 20: 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

17.   Which of the following countries is least dissimilar to India?
       1. China   2. Japan   3. Malaysia   4. Thailand

18.   Which amongst the following countries is most dissimilar to India?
       1. China   2. Japan   3. Malaysia   4. Thailand

19.   Which of the following pairs of countries are most dissimilar?
       1. China & Japan   2. India & China
       3. Malaysia & Japan   4. Thailand & Japan

20.   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

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

Choose1   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 statements alone.
Choose 3   if the question can be answered by using both statements together but not by either statement alone.
Choose4   if the question cannot be answered on the basis of the two statements.

21.   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 candidate 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.

22.   Zakib spends 30 % of his income on his children's education, 20% on recreation and l0% 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.

23.   Tarak is standing 2 steps to the left of a 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 to the right; otherwise he moves one step to 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.

24.   In a class of 30 students, Rashmi secured the third rank among the girl 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 holder and three girls among the top ten rank holders.

25.   Nandini paid for an article using currency notes of denominations Rs.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.

26.   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 gourd cost less than 1 kg potato and 2 kg gourd.

B: I kg potato and 2 kg onion together cost the same as 1 kg onion and.2 kg gourd.
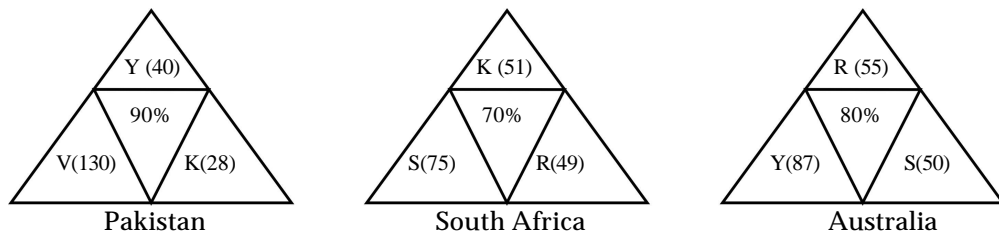
Sub-section I-B: Number of Questions =12
Note: Questions 27 to 38 carry two marks each.

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 runs 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 that was scored by the top three Indian 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.   How many players among those listed definitely scored less than Yuvraj in the tournament?
        1.0   2.1   3.2   4. More than 2

28.   Which of the players had the best M-index from the tournament?
        1.Rahu1   2.Saurav   3.Virender   4. Yuvraj

29.   For how many Indian players is it possible to calculate the exact M-index?
        1.0   2.1   3. 2   4. More than 2

30.   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

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, and 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 experts as each of the other continents.

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

31.   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

32.   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

33.   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 I health expert from Africa attended the conference.
4.   Africa and America each had 1 expert in population studies attending the conference.

34.   If Ramos is the lone American expert in population studies, which of the following is NOT true about 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.

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 semifinals. 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	Game 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 Zeland	2	0	0	2	1	6	0
South Africa	2	0	0	2	1	4	0

In the third round, Spain played Pakistan, Argentina played Germany, and New Zealand 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 Argentina and Germany won their fifth round matches by 3 goals to 0.

       (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.   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

36.   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
      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.

37.   Which team finished at the top of the pool after five rounds of matches?
      1. Argentina   2. Germany

3. Spain   4. Cannot be determined from the data.

38.   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 from the data.

Sub-section II-A: Number of Questions = 20

Note: Questions 39 to 58 carry one mark each.

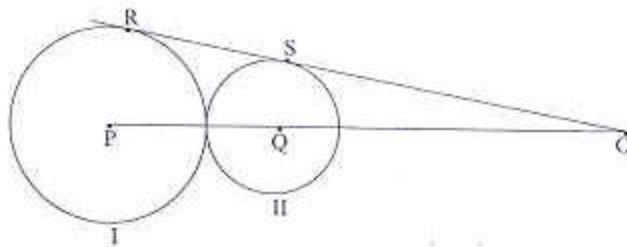**Directions for Questions 39 to 48:** Answer the questions independently of each other.

39.   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

40.   Two boats, traveling 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

41.   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

42.   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

43.   In NutsAndBolts 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

44.   On January 1, 2004 two new societies, SI and S2, are formed, each with *n* members. On the first day of each subsequent month, S_1 adds *b* members while S2 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* =10.5 *n*, what is the value of *r?*
        1.2.0   2.9   3.1.8   4.1.7

45. 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 11metres.
4. Karan beats Arjun by 1 metre.

46. 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 shadows 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

47. If the sum of the first 11 terms of an arithmetic progression equals that of the first l9 terms, then what is the sum of the first 30 terms?
1.0   2. -1   3. 1   4.Not Unique

48. if $\dfrac{a}{b+c} = \dfrac{b}{b+c} = \dfrac{c}{b+c} = r$ then r cannot take any value except
1. $1/2$ 2. -1 3. $1/2$ or -1 4. $-1/2$ or -1

Directions for Questions 49 to 51: 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. This 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.

49. 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

50.   What is the radius of the circle II?
        1.2cm   2. 3cm   3. 4cm   4. 5cm

51.   The length of SO is
        1.8 3 cm   2.10 3 cm   3.12 3 cm   4. 14 3 cm

Directions for Questions 52 to 58: Answer the questions independently of each other.

52.   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

53.   Let $f(x) = ax^2 - b |x|$, where a and bare 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 $a > 0, b < 0$

54.   If $f(x) = x^3 - 4x + p$, and f(0) and f(l) 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. $-3 < p < 0$

55. 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

56.   If a man cycles at 10 km/hr, then he arrives at a certain place at I p.m. If he cycles at 15 km/ hr, he will arrive at the same place at 11 a.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

57.

$$Y = \cfrac{1}{2 + \cfrac{1}{3 + \cfrac{1}{2 + \cfrac{1}{3 + \cdots}}}}$$

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. $\dfrac{\sqrt{15} - 3}{2}$
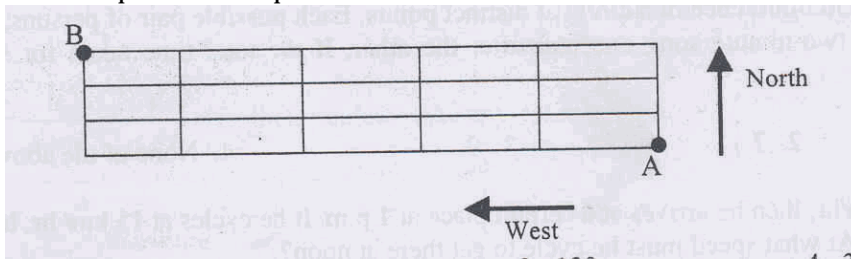
58. A rectangular sheet of paper, when halved by folding it at the mid point of its longer side, results in a rectangle, whose longer and shorter sides are in the same proportion as the longer and shorter sides of the original rectangle. If the shorter side of the original rectangle is 2, what is the area of the smaller rectangle?

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

Sub-section II-B: Number of Questions = 15
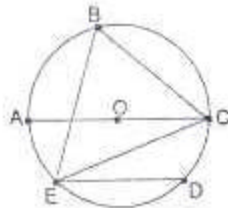
Note: Questions 59 to 73 carry two marks each.

Directions for Questions 59 to 67: Answer the questions independently of each other.

59. 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?
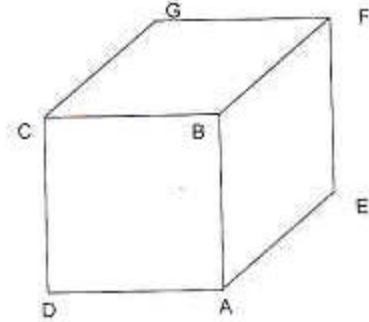

1. 15   2. 56   3. 120   4. 336

60. In the adjoining figure, chord ED is parallel to the diameter AC of the circle. If ∠CBE = 65°, then what is the value of ∠DEC?
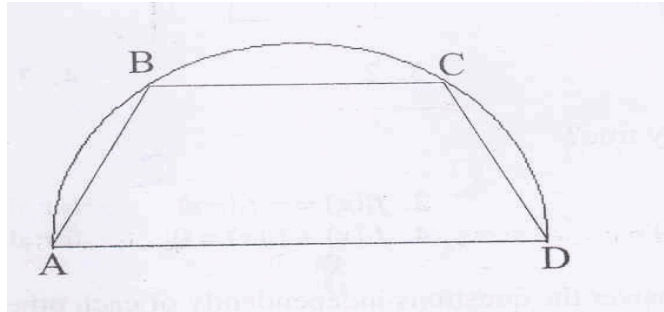

1. 35°   2. 55°   3. 45°   4. 25°

61.   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.   √3 times the side of the cube

3. $\dfrac{1}{\sqrt{3}}$ times the side of the cube

4.   impossible to find from the given information

62.   A sprinter starts running on a circular path of radius r metres. Her average speed (in metres/minute) is ? r during the first 30 seconds, ? r /2 during next one minute, ? $r/4$ during next 2 minutes, ? r /8 during next 4 minutes, and so on. What is the ratio of the time taken for the *nth* round to that for the previous round?

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

63.   Let C be a circle with centre P_0 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_1B and so on. Let-C_1, C_2, C_3, ...be circles with diameters $P_0 P_1$, $P_1 P_2$, $P_2 P_3$ ...respectively. Suppose the circles C_1, C_2, C_3, are all shaded. The ratio of the area of the unshaded portion of C to that of the original circle C is

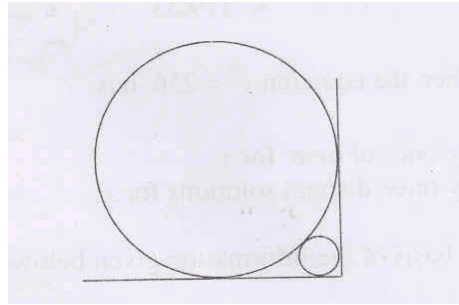1. 8:9   2. 9:10   3. 10:11   4. 11: 12

64. 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

65. 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. $6-4\sqrt{2}$

66. The remainder, when $(15^{23}+23^{23})$ is divided by 19, is
1. 4　　　　2. 15　　　　3. 0　　　　4. 18

67. 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 this 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

Directions for Questions 68 and69: Answer the questions on the basis of the information given below.

$$f_1(x) = x \qquad 0 \leq x \leq 1$$
$$= 1 \qquad x \geq 1$$
$$= 0 \qquad \text{Otherwise}$$

$$f_2(x) = f_1(-x) \qquad \text{for all } x$$
$$f_3(x) = -f_2(x) \qquad \text{for all } x$$
$$f_4(x) = f_3(-x) \qquad \text{for all } x$$

68. 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

69. 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 70 and 71: Answer the questions independently of each other.

70. Consider the sequence of numbers a_1, a_2, a_3 ...to infinity 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

71. 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

Directions for Questions 72 and 73: 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.

72. 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

73.   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. 12or 13   3. 13or 14   4. 14or 15

SECTION III

Note: Questions 74 to 83 carry half a mark each. All the other questions in Sub-section III-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 with 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. Last Sunday, Archana had nothing to do.
       B. After waking up, she lay on the bed thinking of what to do.
       C. At 11o'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

85.   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

86.   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

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.   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 Gujarat.
       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,

88.   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 incidence of music
               piracy, others advocate strong legal action against offenders,
       4.   audiocassette prices to be brought down to reduce incidence of
               music piracy, others advocate that strong legal action must be taken
               against offenders,

89. 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 portrayed must have every relevant feature shown as clearly as possible
   2. it was essential for things they portray to have had every relevant feature shown as clearly as possible,
   3. it was essential that the things they portrayed had every relevant feature shown as clearly as possible,
   4. that when they portrayed things, it should have every relevant feature shown as clearly as possible

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

90. 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.

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. 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.

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

93.   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

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.   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

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.   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.

97. 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 your prejudices unless they behave badly with you.

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

PASSAGE I

Recently I spent several 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 cliches. 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 a good reason.' We are 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 ~ 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 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 becomes 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 required 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 cannibalize their expertise, along with most of their factories.

98.   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.

99.   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.

100. 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.

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 a painting of some fruit can be as important as a painting of a hero dying. The Impressionists 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. A subject does not start with what is put in front of the easel or with something which the painter happens to remember. A subject 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 (1 will paint this and not everything

else in the world); it is finished when that selection is justified (now you can see all that 1 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 not 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, ()f 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. 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.

103.   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.

104.   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.

105.   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 its subject selection.
3.   The subject has a personal meaning for the painter.
4.   The painting of subjects is inspired by historical developments.

106.   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.

PASSAGE III

Throughout human history the leading causes of death have been infection and trauma. 'Modem 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 possess 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 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 micronutrients 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 modem 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 an 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 about 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 micronutrients, 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 test 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 micronutrients 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 micronutrients, and most of the micronutrients 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.

107. 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 risk 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

108. 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.

109. Tailoring micronutrient-based treatment plans to suit individual deficiency profiles is not necessary because
    1. it very likely to give inconsistent or negative results.
    2. it is a classic phannaceutical approach not suited to micronutrients.
    3. most people are consuming suboptimal amounts of safe-to-consume micronutrients.
    4. it is not cost effective to do so.

110. The author recommends micronutrient-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.

PASSAGE IV

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 200 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 laborers. 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 of 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 neighborhood, they say, and it breeds tougher lions.

But are they really tougher? 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 unmaned 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.

111.   The book Man-Eaters o f 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 male Tsavo lions were killed.

112.   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.   Though 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.

113.   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.

114.   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.

PASSAGE V

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 1870 in a spirit of Capitalism Triumphant, soon became 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; i.e., a class-conscious labour force at home; a middle class in the hinterland; and rival centres 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 soldiers in the hinterland to maintain stability at the cost of development. A great part of the surplus extracted 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 crisis and an unemployment (or population) crisis-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 this 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 in 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.

115.   According to the author, the British policy during the 'New Imperialism' period tended to be defensive because
        1.   it was unable to deal with the 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.

116.   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.

117.   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.

118. In the sentence, "They are prisoners of the taste patterns and consumption standards set at the centre." (fourth paragraph), what is the meaning of 'centre'?
1. National government.
2. Native capitalists.
3. New capitalists.
4. None of the above.

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 labeled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.

A. Experts such as Larry Bums, 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 monuments 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 buried 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. CDBEA   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.   Modem 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. Smother the will with excessive intellectualizing 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 realized, he must forego relying on the intellect and nurture again the instinctual roots of human existence.

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

122.   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 subsidized price. With the injustice so compounded, local communities at the receiving end of this process have no resource expert 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 state 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 subsidized prices for an expanding commercial-industrial economy.

123. Although almost all climate scientists agree that the Earth is gradual1y 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 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 wil1 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 a 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.

DATA INTERPRETATION / LOGICAL REASONING

1. (3)	2. (4)	3. (1)	4. (4)	5. (1)	6. (2)	7. (3)	8. (2)	9. (2)	10.(2)
11.(1)	12.(4)	13.(1)	14.(3)	15.(2)	16.(1)	17.(1)	18.(2)	19.(4)	20.(4)
21.(1)	22.(1)	23.(1)	24.(2)	25 (4)	26.(3)				
27.(3)	28.(2)	29.(3)	30.(2)	31.(3)	32.(4)	33.(3)	34.(3)	35.(4)	36.(2)
37.(4)	38.(2)								

QUANTITATIVE APTITUDE

39.(3)	40. (3)	41. (4)	42. (1)	43. (3)	44. (1)	45. (4)	46. (4)	47. (1)	48. (3)
49. (2)	50. (2)	51. (3)	52. (1)	53. (4)	54. (2)	55. (2)	56. (2)	57. (4)	58. (2)
59.(2)	60. (4)	61. (1)	62. (3)	63. (4)	64. (2)	65. (4)	66. (3)	67. (1)	68. (3)
69. (2)	70. (3)	71. (2)	72. (4)	73. (2)					

VERBAL ABILITY

74. (3)	75. (1)	76.(4)	77.(1)	78.(2)	79.(1)	80.(4)	81.(3)	82.(2)	83.(4)
84. (1)	85. (3)	86.(2)	87.(4)	88.(3)	89.(3)	90.(4)	91.(4)	92.(2)	93.(2)
94. (4)	95. (1)	96.(1)	97.(2)	98.(2)	99.(2)	100.(4)	101.(1)	102.(3)	103.(2)
104.(1)	105.(4)	106.(1)	107.(4)	108.(2)	109.(3)	110 (1)	111 (3)	112.(3)	113 (3)
114(3)	115 (1)	116 (4)	117 (3)	118(2)	119 (1)	120 (3)	121 (4)	122.(3)	123.(2)

Explanatory answers

1.   Avg. Income of
        Ahuja = 3400 + 3000 + 2800 ∕ 3 =3066
        Bose = 2400 + 2100 + 2800 ∕3 =2433
        Coomar = 1100 + 2200 + 1600 ∕3 =1633
        Dubey = 1300 + 3200 ∕2 = 2250
        So the lowest avg. income is of Coomar.
        Answer option is(3)

2.   Avg. Expenditure of
        Ahuja = 1600 approx. (Middle value on x axis)
        Bose = 1700 approx. (Middle value on x axis)
        Coomar = 1100 approx. (Middle value on x axis)
        Dubey = 2000 approx.
        So the higest avg. Expenditure is of Dubey.
        Answer option is(4)

3. Highest savings accrues to the member of Ahuja which is 3400-600 = 2800. Answer option is (1).

4. Lowest avg. savings is of Dubey family as its points are closest to the line Income= Expenditure. Answer option is(4)

Que 5-8

5. Grade points of Preeti are $0 + 2*2 + x + y = 3.2 * 5 = 16$
So $x = y = 6$. Answer option is(1).

6. For Tara grade points are $4 + 3x + y = 2.4 * 5$ (Using c statement)
$3x + y = 12 - 4$
$3x + y = 8$.
Possible values of x & y are x = 0,1,2 and corresponding values of y = 8,5,2
Out of these only possible value is x = 2 and y = 2. Answer option is(2).

7. In marketing Utkarsh grade is B (Using statement b & previous calculation)
Now,
For Utkarsh $x + 4 + 0 + 3 + 6 = 3*5$
$x + 13 = 15$, or x = 2 =D. Answer option is(3)

8. For Gowri
$3 + 3 + 6 + x + 4 = 3.8 * 5$
$x + 16 = 19$
$x = 3 = C =$ Grade in strategy
For Fazal
$2 + 0 + 4 + x + 2 = 2.4 * 5 = 12$
$x = 4 = B$
For Hari we don't know
For Nisha grade for strategy is A = 6
For Rahul
$6 + 3 + 6 + x + 0 = 4.2 * 5$
$x = 6 = A$
So the only answer option left is Hari. Answer option is(2).

Questions 9 to 12:

9. Answer option (2) In 97 no. of NMG purchased are 30 so in 99, 20% of these i.e.,6 will be disposed off it means 24 are carried forward, 50 are purchased in 98. So total no. of NMG purchased in 99 will be 124-(50+24) =50.

10.   Answer option (2).In 99 no. of disposed off NMG =6. In 2000 the no. of disposed off NMG will be 20% of newly purchased in 98 i.e., 20% 0f 50 =10. Total no. of disposed off NMG by end of 2000 will be 16.

11.   Answer option.(1).As 10 Purana mixer grinder were purchased in 1997 and difference between 1996-97 Purana brands is 182 –162 =20. So total mixer purchased in 1997 =20+10 =30.

20% of 30 = 6.So 6 Purana brands were disposed off in 1999. So total purchased in 1999 = (236-222) + 6 =14+6 =20.

12.   Answer option (4) Since we don't have any idea, how many Purana mixer grinder were disposed off in 2000. We cant calculate this also, as we don't have again knowledge of no. of purchase or disposed of in year 1998 or 96.So answer cannot be determined.

Questions 13 to 16:

From the observation of the given table we come to know that
University Country

University	Country
4	UK
6	USA
8	India
7	CA/UK
5	NL/India
3	NL
2	UK/CA
1	NL

13.   Answer option (1)
14.   Answer option (3)
15.   Answer option (2)
16.   Answer option (1)

Caselet : 17 – 20

17.   For India-China, dissimilarity = 2
        For India–Japan, dissimilarity = 4
        For India-Malaysia, dissimilarity = 3
        For India-Thailand, dissimilarity = 3
        Hence answer is (1) CHINA.

18.   From above question, answer option is (2) JAPAN.

19.   For China-Japan dissimilarity = 3
        For India-China dissimilarity = 2
        For Malaysia-Japan dissimilarity = 3
        For Thailand-Japan dissimilarity = 4
        So answer is (4).

20.   For Malaysia-China dissimilarity = 4
        For China-Thailand dissimilarity = 4
        For Thailand-Japan dissimilarity = 4
        For Japan-Malaysia dissimilarity = 3
        So answer is (4).

Questions 21 to 26:

21.   By statement A alone you can find out who wins the award.
        But statement B alone is not sufficient.
        So answer is (1).

22.   By statement A you cannot find the answer.
        By statement B alone you can find who spends more on children's education.
        So answer is (1).

23.   By using statement A alone you cannot get the answer.
        By statement B alone is sufficient to get the answer.
        So answer is (1).

24.   By statement A you can get the answer.
        By statement B you can get the answer.
        both the statement alone are sufficient, so answer is (2).

25.   Statement A alone is not sufficient.
        Statement B alone is not sufficient.
        Combining both the statement you cannot get a unique answer.
        So answer is (4).

26.   Statement A alone is not sufficient.
        Statement B alone is not sufficient.
        Combining both the statement you can get the answer.
        So answer is (3).

Que 27-30

        Against Pakistan total was 220 so rest made only 22
        Against South Africa total was 250 so rest made only 75

Against Australia total was 240 so rest made only **48**
Now based on this information

27. Number of players those have definitely scored less than Yuvraj are **2** i.e Saurav and Rahul. Hence Answer option is(3).

28. Clearly from the above information best M index is of Saurav. Answer option is(2).

29. It is possible to calculate the exact M index for Rahul and Saurav. Answer option is (3).

30. Lowest R index can be of Kaif or Rahul who have R index of 23 or more. Answer option is (2).

Que. 31 to 34:

From the given data: Labour experts (LE) = 3
Health experts (HE)= 6
Population studies experts (PSE)= 6
Refugee Relocation experts (RRE)= 6
Experts from: America = 8
Africa = 4
Europe = 4
Australasia = 5

	LE	HE	PSE	RRE
America	1			
Australasia	1	1	2	1
Africa	0			
Europe	1	1	1	1

31. Answer option is (3).

	LE	HE	PSE	RRE
America	1	2	2	3
Australasia	1	1	2	1
Africa	0	2	1	1
Europe	1	1	1	1

32. Answer option is (4).
33. Answer option is (3).
34. Answer option is (3).

	LE	HE	PSE	RRE
America	1	3	1	3
Australasia	1	1	2	1
Africa	0	1	2	1
Europe	1	1	1	1

Questions 35 to 38:

	Germany	Argentina	Spain	Pakistan	New Zea.	S. Africa
I	2,1	1,0	5,1 ü	2,0 ü	1,5 ü	0,2 ü
II	1,0	1,0	0,1 ü	0,1 ü	0,1 ü	1,2 ü
I	-	-	4,0 r		0,4 r	
II	-	-	0,2 r		1,2 r	
I	-	-	4,1 r		1,4 r	
II	-	-	0,1 r		0,2 r	

From the given information we can derive possible scores for different teams for first two rounds which is shown above.

For example:
for country like Germany possible scores will (2,1) & (1,0) only as it is winning 2 games. {(1,1) is not possible as there is no draw}

Similarly we can derive for Argentina, Pakistan .

For Spain there will be three possibilities based on which three possibilities of New Zealand is derived.

Finally to match with only possible score of Germany, score of South Africa will have only one possibility.

As Germany, Argentina, & Pakistan appeared with single possibility so there should be match pair for all these scores. By applying this concept we can ruled out other possibilities for Spain & New Zealand.

35.   Score of Germany (2,1) is matched only with South Africa (1,2). So only fourth statement is correct.
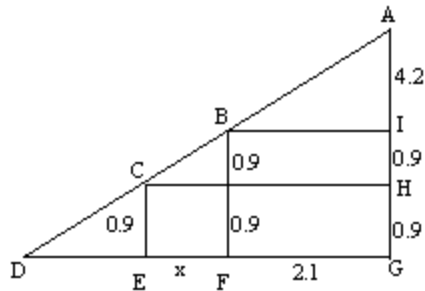
36. By making pairs b/w scores from above table:-
    Ist statement:- Not possible as b/w them Pakistan won by (2,0)
    II statement:-????
    III statement:- No match b/w Germany & Pakistan { No matching }
    IV statement:- Germany beat Spain by (1,0)
    So only statement possible is (b).

37. Can't be determined as We don't have any idea of fourth round of Germany & Argentina.

38. As Pakistan has won two matches at the end of round, it must had been played against Argentina, which in turns reduced the difference b/w Goal for- goal against for Argentina. No such possibility for Germany.

39. Given equation is x+y=xy, so only two pairs satisfies this and those are (0,0) and (2,2). Hence answer option is (3).

40. Their relative speed is 15 km/h they are 20 km apart hence in 80 min they will collide. Now in 79 min distance covered by first boat is 79/12 km and distance traveled by second boat is 79/6 km so they are ¼ km apart. Hence answer option is (3).

41. adult>boys>girls>families

    A   B   G   F
    4   3   2   1 - 4 Adults per family-not applicable
    5   4   3   2 - adult\family>2
    6   5   4   3 - possible condition

So the answer option is (4).

42. Here n is going to be an eleven digit number.
    (i)   if first digit is 1 then another 1 can be fixed at 10 places. So there are 10 ways.
    (ii)   if first digit is 2,there is only one number, so 1 way.
            Total number of ways=11. Hence answer is 1.

43. 1st m/c produces1000 nuts in 15m or say 2000 nuts in 30 m.
    2nd m/c produces 1500 bolts in 30m.
    Total 1500 pairs in 30 m so 9000 pairs in 180-10=170m(we have to subtract last 10m of rest. Hence answer option is 3.

44. It is given that b=10.5n so total members s1 on July 2, 2004 =n+63n (for 6 months) = 64n. Similarly S2 will be $n \cdot r^6$. So $64n = n \cdot r^6$. Hence r = 2. So answer option is (1).

45. Time in which Karan travels 100 m Arjun travels only 90 m. Hence the ratio of their speeds is 10:9.
Time in which Karan covers 110m, Arjun will cover 99m. Hence Arjun is beaten by 1 meter. Hence answer is 4.

46. The shadow of head of father and son coincide so diagram will be like this:

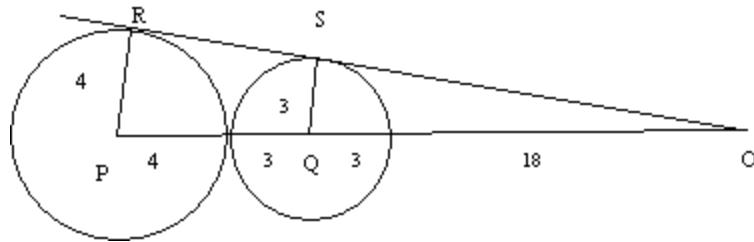If their heads coincide at point D then angle ACH and angle ABI will be the same.
In triangle ABI and triangle TCH
$4.2/2.1=5.1/(2.1+x)$
When we solve this equation we get x=0.9. hence answer option is 1.

47. Sum of the first 11 terms of an A.P. for which first term is a and common difference is d will be $11/2(2a+10d)$ and for 19 terms it will be $19/2(2a+18d)$.
According to problem $11/2(2a+10d)=19/2(2a+18d)$
$22a+110d=38a+342d$
$16a=-232d$ Þ $2a=-29d$
Now we have to find out sum of first 30 terms that will be $15(2a+29d)=30a+435d$ Þ $15*(-29)d+435d$ Þ 0. Hence answer option is 1.

48. The given condition will be satisfied only whan all of a,b,and c are equal and then put any value you will get r=1/2. when a+b +c =0, we get the value of r = -1. Hence answer is option is (3).
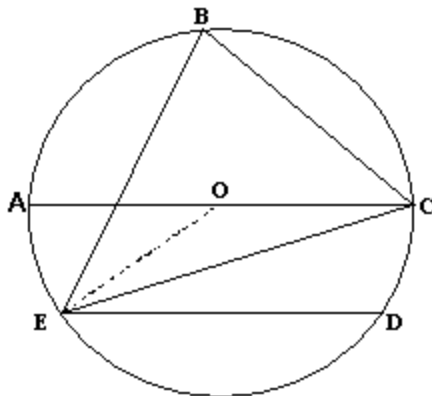
49 to 51.

Ratio of the length of PQ and OQ will be 1:3. Hence answer of 49 is option (2).
Radius of the circle II is 3 cm. Hence answer of 50 is option (2).
RO and SO are the tangents to the circles so angle ORP and angle OSQ will be right angle triangle.
Total PO is 28 so OQ will be 18. In triangle OSQ by pythagoras theorem $OQ^2-QS^2=OS^2 \Rightarrow OS^2=21^2-3^2 \Rightarrow OS=12\sqrt{3}$. Hence answer of 51 is 3.

52. Out of total 100 liters of mixture there is 20 liters of water and 80 liters of milk. When he sells ¼ part of mixture that is 25 liters now water will be 15 liter and 60 liters of milk in total 75 liters of mixture. When he adds 25 liters water in it now total water will be 25+15=40 liters and milk is 60 liters. So the required ratio is 40:60=2:3. Hence answer is 1.

53. $f(x) = ax^2 -b|x|$. Value of x^2 and $|x|$ is always greater than or equal to zero. the value of function depends only on a and b. The given function will be minimized when you put a>0 and b<0. Hence answer option is (4).

54. $f(x)=x^3-4x+p$ so $f(o)=p$ and $f(1)=p-3$ if $f(0)$ and $f(1)$ are of opposite sign then the range of p will be 0<p<3 and the other way round is not possible. Hence answer option is (2).

55. Total songs are 14. Two people can be selected in nC2 ways but there will be n pairs which are adjacent .So answer will be=>nC2 – n =14, on solving we will get n=7. Hence answer option is 2.

56. In both the cases distance covered is constant hence speed will be inversely proportional to time. So the ratio of times taken in both the cases will be 3:2. On ratio scale difference is 1 while actual difference is 2. So C.F.M. is 2 so time taken in first case is 6 hours and in second case it is 4 hours hence total distance covered is 10*6=60 KM. he is taking 6 hours in first case and reaching there at 1 p.m. so must had started at 7 a.m. To reach there at noon time taken is 5 hours and distance is 60 km. so speed should be 12 kmph. Hence answer option is (2).

57. We can write the given expression as $Y=1/(2+1/(3+Y))$
when we solve this quadratic equation we get $Y=(\sqrt{15}+3)/2$. Hence answer option is (4).

58. Let the longer side of bigger rectangle is 2x so the ratio of longer side and smaller side is 2x:2 and one side of smaller rectangle will be 2 while other side will be x, so for this rectangle
ratio is 2:x. according to problem $2x/2=2/x$ this gives $x=\sqrt{2}$. So the area of smaller rectangle will be $2\sqrt{2}$. Hence answer is (2).

59. Total no of ways is equal to $(m+n-2)!/(m-1)!(n-1)!$ Where m=4 & n=6 thus number of ways = 56. Hence answer option is (2).
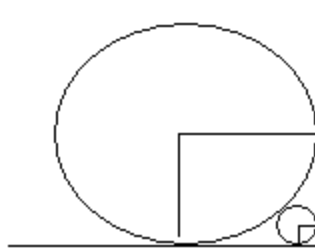
60.

Angle EBD is 65° so the angle EOC will be 130° now angle OCE and OEC will be same (angle opposite the equal sides) so OCE+OEC+130° =180° hence OCE will be 25° since AC and ED are parallel hence angle CED will be equal to angle to OCE hence angle DEC will be equal to 25°. hence answer option is (4).

61. If the side of a triangle is a then length of the triangle will be $a\sqrt{3}$. So sides of that triangle will be $a\sqrt{3}$. So circum radius of the this triangle will be $a3^3\sqrt{3}/((4\sqrt{3}/4)a^23$. When you solve this equal to a. hence answer option is (1).

62. Radius is r meters so he will cover one circumference in 30+60+120+240 =450 seconds in first round and in second round he will take 480+960+1920+3840=7200 seconds. So the required ratio is 7200/450=16. Hence answer option is (3).

63. Let the diameter AB is 2r, so P_0B will be r, p1B will be r/2 and p2B will be r/4 and so on. Diameter of C1 will be r/2 diameter of C2 will be r/4 and so on. So total shaded region will be $\pi (r/4)^2+\pi (r/8)^2+\ldots\ldots$ (this will be a infinite series). Hence total Shaded area = $(\pi (r/4)^2)/(1-1/4) = 4(\pi (r/4)^2)/3 = \pi r^2/12$.

Area of Original circle will be ? r². Hence area of unshaded portion will be 11? r²/12. So the required ratio is 11:12. Hence answer is (4).

64. Join B&C to the centre of circle O . AO = BO = CO = DO = 4 Area of the triangle ABO = v5(5-4)(5-4)(5-1) = v15 =(1/2) *4*x thus x = v15/2. x= height of ? ABO= BL. Thus AL = v[4 – (15/4)] = v1/4 = ½ and BC = 8 – 2(AL) = 8 – 1 = 7

65.

Let the radius of small circle is r. So the diagonal of small circle is v2 r. Radus of the larger circle is 2(given). Hence the diagonal of the larger square is 2v2. Hence 2v2 = 2 + r + rv2.
We get r = 6 - 4v2. Hence answer option is (4).

66. We can rewrite the numerator as (-4)23 + 423. Hence we get remainder = 0. Hence answer option is (3).

67. The first strip can be coloured in 4 ways 2nd in 3, 3rd in 3and so on thus total no of ways = 4*3*3*3*3*3 = 12*81

68. For all the finite values of f1(x) the values of f2(x) is zero thus f1(x) f2(x) is always zero f2(x) f4(x) is also equal to zero for the same reason

69. By substituting the values we get f1(x) = - f3(-x). Hence answer option is (2).

70. Given that a1=81.33,a2=-19
a3=a2-a1
a4=a3-a2=-a1
a5=a4-a3=-a2
a6=a5-a4=a1-a2
a7=a1
a1+a2+a3+a4+a5+a6=0
So for every 6 terms sum will be 0
So a1+a2+………a6000 =0
a1+a2+…………a6002=a6001+a6002=a1+a2
=81.33-19=62.33. Hence answer option is (3).

71. $x^u = 256$
take log on base 2, $u \log_2 x = 8$
let $\log_2 x = p$
then $8/p = p^2 - 6p + 12$
$p^3 - 6p^2 + 12p - 8 = 0$
$p2 (p-2) - 4p (p-2) + 4 (p-2)$
$(p2 - 4p + 4) (p-2) = 0$
$(p-2)3 = 0$
$p = 2$
Hence exactly one solution. Answer option is (2).

72. Group A carries 1 mark
Group B carries 2 mark
Group C carries 3 marks
Now group A carries atleast 60% that means group B and C carry at the most 40% but since we don't know the actual breakup of B and C we cannot predict the no. of questions in C.

73. Group C contains 8 questions that is 24 marks , now group B carries atleast 20% that means group C carries atmost 20% marks , but 20% correspond to 24 marks which then is the least no of marks in group B but in B each question carries 2 marks so the least no of questions is equal to $24/2 = 12$ hence option (2) .

74. The answer is (3). As the first line of the passage says that the White House was 'serene', striking, hollow and white are unsuitable adjectives for the corridors, the correct answer is empty.

75. The answer is (1). The word quiet suits the context of the passage, as the general atmosphere seems hushed. Stentorian refers to people with powerful voices, but we have no mention of them 'now' speaking in whispers so it can be eliminated. Faded is tautological

76. He answer is (4). Scowled means "to frown with displeasure", so laughter, curiosity and humor are not suited in the given context. The answer is temper, as his temper was easily activated so he scowled.

77. He answer is (1). Pace is used to refer to continuos up and down movement. Prowled has associations with a predator looking for prey is too strong a word, given the context. Similarly stormed is a very strong word and strolled is to walk leisurely and with no apparent aim and therefore out of context.

78. He answer is (2). The given statement is straightforward and the best answer is blunt which means direct.

79. The answer is (1). The passage talks about taxes and taxes have increased from Rs. 20,000 to 60,000, so the best answer would be interest.

80. The answer is (4). Following a similar logic as the previous question the answer for this would be fines. Sanctions means restrictions and refunds are amounts received back.

81. The answer is (3). Attach is to take temporary possession of as a security, by legal authority. Impound means "to take legal possession of", which is most often used for objects rather than funds.

82. The answer is (2). Seize also means to take possession of, which is the correct answer is the given context as the passage implies confiscation of property.

83. The answer is (4). The person not paying taxes is a legal offender, hence (4) is the correct answer. He cannot be a purchaser or an investor. Victim cannot be used as the person has committed an offence.

84. The answer is (1). Statement (b) should be "After she woke up, she lay..." Statement (c) uses preposition "at" which is used to indicate a specific time and she could not take shower and get ready exactly at 11.

85. The answer is (3). Statement (B) should be her efforts 'bore' fruit and not gave fruit. Statement (c) also is incorrect, the correct statement should be "Everyone complemented her on the good work".

86. The answer is (2). (B) The sentence must read 'Raj pleaded guilty to stealing money" And statement (d) "He was sentenced to three years in jail".

87. The answer is option (4) 'estimated with reasonable certainty' properly describes the 'red-ware pottery' mentioned in the sentence. The sentence construction of options (1) and (2) and (3) are ungrammatical.

88. The answer is option (3). ' suggest ' should be followed an '-ing' form of verb. Therefore we can only consider option (2) and (3). The correct usage is 'incidence' and not 'incidents' of piracy.
     1 beginning the sentence with 'to' is instantly eliminated.

89. The answer is option (3) the sentence begins with the past tense. Option (1) there is tautology in repetition of the expression 'that' and the use of '… must have…' changes the tense to future tense. Option (2) '… to have had…' is expressed in past perfect tense. Option (4) brings the sentence into simple present tense.

90.   The answer is option (4). Fallout refers to 'radioactive debris caused by a nuclear explosion or accident. And also the adverse side effects of a situation etc.' In options (1), (2) and (3) the use of the word is agreeable with the meaning of the word. In option (4) 'fallout of several of his good students…' does not make sense.

91.   The answer is option (1). Passing means transient, fleeting, cursory, incidental and in senses of pass. Options (2), (3) and (4) are in agreement with the meaning of the word. Option (1) '… have passing marks…' is ungrammatical. The correct usage is 'pass marks'.

92.   The answer is option (2). Bolt means a metal pin with a head, to fasten or lock a door, a sudden escape, a roll of fabric. Options (1), (3) and (4) agree with the meaning of the word. In option (2) 'he made a bolt' which refers to a dash for freedom which, does not agree with the information preceding it 'as he could not move'

93.   The answer is option (2). Statement 'B' describes a hopeless situation, 'E' amplifies the description statement 'D' adds to the information and 'A' describes the scenario in the opposite direction. 'C' adds to the preceding statement. The other option following a similar link is option (1), however 'B' concluding the passage does not exhibit logical flow of information.

94.   The answer is option (4). 'E' provides a reference to statement 'C'. Statement 'B' follows from 'D' and statement 'A', acts as a concluding line. The link DBA is a also present in option (2) but the link 'E', 'C' do not follow from it.

95.   The answer is option (1) there is a clear link between statement 'B' and 'E'. This is given only in option (1). Statements 'D', 'A' and 'C' follow logically.

96.   The answer is option (1). This option covers the entire scope of the passage, mentioning the climate and the food type as discussed in the passage. Option (1) is the most concise answer.

97.   The answer is option (2). Option (1) in the second statement mentions 'complain' which is not intended in the passage. Option (3) talks about '… you should learn to not make enemies…' which again diverts from the given information. Option (4) again diverts from the intended meaning of the passage. Option (2) brings out the most concise meaning.

98.   The answer is (2). The answer can be inferred from the 4th and 6th paragraphs, where the author says that even after "a hundred years and tens of thousands of research hours later" little has changed in the auto industry and also changes in the aviation industry are incremental and largely cosmetic.

99.   The answer is (2). The answer can be inferred from the 4th paragraph -
        Henry Ford's first car did 18 miles per hour and in 2001 the average speed
        in London was 17.5 miles per hour as stated in the last line of the fourth
        paragraph.

100.   The answer is (4). The answer can be inferred from the 6th paragraph – "fifty
        years after….largely cosmetic changes." incremental

101.   The answer is (1). The answer can be inferred from the last paragraph 2nd
        line onwards – "in the 1960s, the German auto companies developed plans
        to scrap the entire combustion engine…..why didn't it go anywhere?
        Because auto executive understood pistons and carburettors, and would be
        loath to cannibalize their expertise, along with most of their factories."

102.   The answer is (3). The answer can be inferred from the 1st paragraph. The
        1st line says – "the painter is now free to paint anything he chooses and then
        the 3rd line says – "yet, by the next generation, painters began to abandon
        the subject altogether and began to paint abstract pictures."

103.   The answer is (2). The answer can be inferred from the 7th paragraph –
        "when a culture is in a state of disintegration or transition the freedom of the
        artist increases…...he, himself, has to choose for society."

104.   The answer is (1). The answer can be inferred from the 7th paragraph, 1st
        line – "when a culture is in a state of disintegration or transition the freedom
        of artist increases."

105.   The answer is (4). All except option 4 are attributes needed for a painter to
        succeed as mentioned in the passage. Option 1 is mentioned in the 5th
        paragraph 1st line – "painter and his public agree about what is significant",
        option 2 can be inferred from the 3rd paragraph, last line – "the function of
        the painting….significance of that selection" and option 3 is mentioned in
        the 3rd paragraph 3rd line – "a subject starts with….he finds it meaningful."

106.   The answer is (1). All except option 1 is true. Option 2 can be inferred from
        6th paragraph – "when a culture is secure and certain….reeds and water in
        China", option 3 is mentioned in the 7th paragraph 3rd line – "it is too often
        forgotten…..choice of subject," and option 4 can be inferred from 5th
        paragraph.

107.   The answer is (4). The answer can be inferred from the 2nd last line 1st
        paragraph – "these have a long latency period… people are pre-ill."

108.   The answer is (2). The first paragraph discusses that there are several
        degenerative diseases, which contribute to ill- health, and gives us examples

of these diseases. They are the cause of concern and are caused by malnutrition.

109.   The answer is (3). The answer can inferred from the last paragraph 3rd last line – "the vast majority of people…. concerned very safe."

110.   The answer is (1). The answer can be inferred from the 2nd paragraph 2nd last line – "nutrition is the easiest of these… balance away from disease."

111.   The answer is (3) as the real reason behind the scientists' annoyance is that they consider the Tsavo lions to be no more man-eaters than lions elsewhere, but the book has reinforced the view that they are more aggressive.

112.   The answer is (3). The scientists realized that their earlier skepticism about the authenticity of the amateurs' claims had been hasty as these claims had now been vindicated.

113.   The answer is (3). Gnoske and Peterhans says that Tsavo lions may be similar to the unmaned cave lions of the Pleistocence. Then the 5th line 3rd paragraph says that Tsavo lions have a reputation of ferocity. So logically the unmaned cave lions of the Pleistocence are ferocious. But option 3 says that the unmaned cave lions of the Pleistocence are shown to be far less violent than believed therefore weakening the assumption.

114.   The answer is (3). Other than (3) all the rest will contribute to the image of the Tsavo being ferocious as they are stated in the passage. Option 1 and 2 are present in the fourth paragraph of the passage. Option 4 is clearly stated in the fifth paragraph.

115.   The answer is (1). The answer is given in the first paragraph, 'A major reason was Britain's inability to cope with the by products of its own rapid accumulation of capital…'

116.   The answer is (4). The third paragraph talks of similar problems of division and both, New Imperialism and New Mercantilism leads to instability. Refer to the third paragraph.

117.   The answer is (3). The answer is given in the 4th paragraph. "They cannot easily afford to challenge the international system"

118.   The answer is (2). The answer is given in the 4th paragraph. Refer to the first line of the fourth paragraph

119.   The correct sequence is (1). The link here is CED, which is stated in (1). C says that fuels cells deliver better fuel economy than any existing engines. E and D explain. E says that the fuel cell has an efficiency of 30%. D then shows how this is better than the efficiency of the two existing engines - internal combustion and diesel hybrid.

120.   Here the correct sequence is (3). C and B have to be linked as C tells us that most of our traditional sources of information are … pyramids and tombs. B says even the Papyri (which are among the sources of information about ancient Egypt.) were from the pyramid temples.

121.   Option (4) is the answer as the 4th line of the paragraph says that excessive intellectualizing destroys creativity and the last line of the paragraph says that human beings should nurture their creative instincts. As on the whole the paragraph puts the blame on excessive rational thinking responsible for decline of the modern society, option (4) seems to be the best answer. Option (1) cannot be the answer as it instructs society to forgo intellect. Option (2) can also be ruled out as it contradicts the stated opinion of the passage because the passage says to do away with excessive intellectualizing. Option (3) cannot be considered as it states that Nietzsche is criticising the intellectuals whereas Nietzsche is criticising the modern society because of its heavy emphasis on excessive rationalising.

122.   Option (3) is the answer because it states the preferential treatment given to the agents of resource - intensification by the state and its effect on the local communities. It also tells us how their feeling of injustice effects the society. Options (1) and (2) are not considered as it only states local communities reaction to the preferential treatment but does not talk about the effect of their revolt on the society. Option (4) is also not considered as it states that local communities are "creating " new types of class conflict.

123.   Option (2) is the answer because it talks about scientists being unsure about rapid shifts in earth's climate and how finding a definitive answer will help them to predict the future climatic changes. Option (1) cannot be the answer as it talks about research in general and the paragraph gives more emphasis on finding a" definitive anwer" in terms of climats change. Option (3) is not considered as it gives emphasis only on researches done in Germany. Option (4) is also ruled out because it specifically gives more importance to scientists of germany.