SECTION I

This section contains 25 questions

1. Consider the set $S = \{2, 3, 4, ..., 2n+1\}$, where n is a positive integer larger than 2007. Define X as the average of the odd integers in S and Y as the average of the even integers in S. What is the value of $X - Y$?

   (1) 0

   (2) 1

   (3) $\frac{1}{2}n$

   (4) $\frac{n+1}{2n}$

   (5) 2008

2. Ten years ago, the ages of the members of a joint family of eight people added up to 231 years. Three years later, one member died at the age of 60 years and a child was born during the same year. After another three years, one more member died, again at 60, and a child was born during the same year. The current average age of this eight-member joint family is nearest to

   (1) 23 years

   (2) 22 years

   (3) 21 years

   (4) 25 years

   (5) 24 years

3. A function $f(x)$ satisfies $f(1) = 3600$, and $f(1) + f(2) + ... + f(n) = n^2 f(n)$, for all positive integers $n > 1$. What is the value of $f(9)$?

   (1) 80

   (2) 240

   (3) 200

   (4) 100

   (5) 120

4. Suppose you have a currency, named Miso, in three denominations: 1 Miso, 10 Misos and 50 Misos. In how many ways can you pay a bill of 107 Misos?

   (1) 17

   (2) 16

   (3) 18

   (4) 15

   (5) 19

5. A confused bank teller transposed the rupees and paise when he cashed a cheque for Shailaja, giving her rupees instead of paise and paise instead of rupees. After buying a toffee for 50 paise, Shailaja noticed that she was left with exactly three times as much as the amount on the cheque. Which of the following is a valid statement about the cheque amount?

   (1) Over Rupees 13 but less than Rupees 14

   (2) Over Rupees 7 but less than Rupees 8

   (3) Over Rupees 22 but less than Rupees 23

   (4) Over Rupees 18 but less than Rupees 19

   (5) Over Rupees 4 but less than Rupees 5

6. How many pairs of positive integers m, n satisfy

   $$\frac{1}{m} + \frac{4}{n} = \frac{1}{12},$$

   where n is an odd integer less than 60?

   (1) 6

   (2) 4

   (3) 7

   (4) 5

   (5) 3

1

Directions for Questions 7 through 10: Each question is followed by two statements A and B. Indicate your responses based on the following directives:

Mark (1) if the question can be answered using A alone but not using B alone.

Mark (2) if the question can be answered using B alone but not using A alone.

Mark (3) if the question can be answered using A and B together, but not using either A or B alone.

Mark (4) if the question cannot be answered even using A and B together.

7. The average weight of a class of 100 students is 45 kg. The class consists of two sections, I and II, each with 50 students. The average weight, W_I, of Section I is smaller than the average weight, W_{II}, of Section II. If the heaviest student, say Deepak, of Section II is moved to Section I, and the lightest student, say Poonam, of Section I is moved to Section II, then the average weights of the two sections are switched, i.e., the average weight of Section I becomes W_{II} and that of Section II becomes W_I. What is the weight of Poonam?
    A: $W_{II} - W_I = 1.0$
    B: Moving Deepak from Section II to I (without any move from I to II) makes the average weights of the two sections equal.

8. ABC Corporation is required to maintain at least 400 Kilolitres of water at all times in its factory, in order to meet safety and regulatory requirements. ABC is considering the suitability of a spherical tank with uniform wall thickness for the purpose. The outer diameter of the tank is 10 meters. Is the tank capacity adequate to meet ABC's requirements?
    A: The inner diameter of the tank is at least 8 meters.
    B: The tank weighs 30,000 kg when empty, and is made of a material with density of 3 gm/cc.

9. Consider integers x, y and z. What is the minimum possible value of $x^2 + y^2 + z^2$?
    A: $x + y + z = 89$
    B: Among x, y, z two are equal.

10. Rahim plans to draw a square JKLM with a point O on the side JK but is not successful. Why is Rahim unable to draw the square?
    A: The length of OM is twice that of OL.
    B: The length of OM is 4 cm.

2

Directions for Questions 11 and 12:

Cities A and B are in different time zones. A is located 3000 km east of B. The table below describes the schedule of an airline operating non-stop flights between A and B. All the times indicated are local and on the same day.

Departure		Arrival	
City	Time	City	Time
B	8:00 AM	A	3:00 PM
A	4:00 PM	B	8:00 PM

Assume that planes cruise at the same speed in both directions. However, the effective speed is influenced by a steady wind blowing from east to west at 50 km per hour.

11. What is the time difference between A and B?
    - (1) 1 hour and 30 minutes
    - (2) 2 hours
    - (3) 2 hours and 30 minutes
    - (4) 1 hour
    - (5) Cannot be determined

12. What is the plane's cruising speed in km per hour?
    - (1) 700
    - (2) 550
    - (3) 600
    - (4) 500
    - (5) Cannot be determined.

Directions for Questions 13 and 14:

Shabnam is considering three alternatives to invest her surplus cash for a week. She wishes to guarantee maximum returns on her investment. She has three options, each of which can be utilized fully or partially in conjunction with others.

Option A: Invest in a public sector bank. It promises a return of +0.10%.

Option B: Invest in mutual funds of ABC Ltd. A rise in the stock market will result in a return of +5%, while a fall will entail a return of – 3%.

Option C: Invest in mutual funds of CBA Ltd. A rise in the stock market will result in a return of – 2.5%, while a fall will entail a return of + 2%.

13. The maximum guaranteed return to Shabnam is
    - (1) 0.25%
    - (2) 0.10%
    - (3) 0.20%
    - (4) 0.15%
    - (5) 0.30%

14. What strategy will maximize the guaranteed return to Shabnam?
    - (1) 100% in option A
    - (2) 36% in option B and 64% in option C
    - (3) 64% in option B and 36% in option C
    - (4) 1/3 in each of the three options
    - (5) 30% in option A, 32% in option B and 38% in option C

3

Directions for Questions 15 and 16:

Let S be the set of all pairs (i, j) where $1 \leq i < j \leq n$, and $n \leq 4$. Any two distinct members of S are called "friends" if they have one constituent of the pairs in common and "enemies" otherwise. For example, if $n = 4$, then $S = \{(1, 2), (1, 3), (1, 4), (2, 3), (2, 4), (3, 4)\}$. Here, $(1, 2)$ and $(1, 3)$ are friends, $(1,2)$ and $(2, 3)$ are also friends, but $(1,4)$ and $(2, 3)$ are enemies.

15. For general n, how many enemies will each member of 5 have?

    (1) $n - 3$

    (2) $\dfrac{1}{2} (n^2 - 3n - 2)$

    (3) $2n - 7$

    (4) $\dfrac{1}{2} (n^2 - 5n - 6)$

    (5) $\dfrac{1}{2} (n^2 - 7n - 14)$

16. For general n, consider any two members of S that are friends. How many other members of S will be common friends of both these members?

    (1) $\dfrac{1}{2} (n^2 - 5n + 8)$

    (2) $2n - 6$

    (3) $\dfrac{1}{2} n (n - 3)$

    (4) $n - 2$

    (5) $\dfrac{1}{2} (n^2 - 7n + 16)$

17. In a tournament, there are n teams $T_1, T_2, \ldots, T_n$ with $n > 5$. Each team consists of k players, $k > 3$. The following pairs of teams have one player in common:

    $$T_1 \, \& \, T_2, \; T_2 \, \& \, T_3, \ldots, T_{n-1} \, \& \, T_n, \text{ and } T_n \, \& \, T_1.$$

    No other pair of teams has any player in common. How many players are participating in the tournament, considering all the n teams together?

    (1) $n (k - 1)$

    (2) $k (n - 1)$

    (3) $n (k - 2)$

    (4) $k (k - 2)$

    (5) $(n - 1)(k - 1)$

18. Consider four digit numbers for which the first two digits are equal and the last two digits are also equal. How many such numbers are perfect squares?

    (1) 3

    (2) 2

    (3) 4

    (4) 0

    (5) 1

Directions for Questions 19 and 20:

Mr. David manufactures and sells a single product at a fixed price in a niche market. The selling price of each unit is Rs. 30. On the other hand, the cost, in rupees, of producing x units is $240 + bx + cx^2$, where b and c are some constants. Mr. David noticed that doubling the daily production from 20 to 40 units increases the daily production cost by 66-|%. However, an increase in daily production from 40 to 60 units results in an increase of only 50% in the daily production cost. Assume that demand is unlimited and that Mr. David can sell as much as he can produce. His objective is to maximize the profit.

19. How many units should Mr. David produce daily?

    (1) 130

    (2) 100

    (3) 70

    (4) 150

    (5) Cannot be determined

4

20. What is the maximum daily profit, in rupees, that Mr. David can realize from his business?

    (1) 620 (2) 920
    (3) 840 (4) 760
    (5) Cannot be determined

21. The price of Darjeeling tea (in rupees per kilogram) is $100 + 0.10n$, on the nth day of 2007 $(n=1, 2, \ldots, 100)$, and then remains constant. On the other hand, the price of Ooty tea (in rupees per kilogram) is $89 + 0.15n$, on the nth day of 2007 $(n = 1, 2, \ldots, 365)$. On which date in 2007 will the prices of these two varieties of tea be equal?

    (1) May 21 (2) April 11
    (3) May 20 (4) April 10
    (5) June 30

22. Two circles with centres P and Q cut each other at two distinct points A and B. The circles have the same radii and neither P nor Q falls within the intersection of the circles. What is the smallest range that includes all possible values of the angle AQP in degrees?

    (1) Between 0 and 90 (2) Between 0 and 30
    (3) Between 0 and 60 (4) Between 0 and 75
    (5) Between 0 and 45

23. A quadratic function $f(x)$ attains a maximum of 3 at $x = 1$. The value of the function at $x = 0$ is 1. What is the value of $f(x)$ at $x = 10$?

    (1) −119 (2) −159
    (3) −110 (4) −180
    (5) −105

Directions for Questions 24 and 25:

Let $a_1 = p$ and $b_1 = q$, where p and q are positive quantities. Define

$$a_n = Pb_{n-1}, \qquad b_n = qb_{n-1}, \text{ for even } n > 1.$$
and $\qquad a_n = pa_{n-1}, \qquad b_n = qa_{n-1}, \text{ for odd } n > 1.$

24. Which of the following best describes $a_n + b_n$ for even n?

    (1) $q(pq)^{\frac{1}{2}n-1}(p+q)$ (2) $qp^{\frac{1}{2}n-1}(p+q)$

    (3) $q^{\frac{1}{2}n}(p+q)$ (4) $q^{\frac{1}{2}n}(p+q)^{\frac{1}{2}n}$

    (5) $q(pq)^{\frac{1}{2}n-1}(p+q)^{\frac{1}{2}n}$

25. If $p = \dfrac{1}{3}$ and $q = \dfrac{2}{3}$, then what is the smallest odd n such that $a_n + b_n < 0.01$?

    (1) 7 (2) 13
    (3) 11 (4) 9
    (5) 15

SECTION II

This section contains 25 questions

Directions for Questions 26 to 29: Answer the following questions based on the information given below:

A health-drink company's R&D department is trying to make various diet formulations, which can be used for certain specific purposes. It is considering a choice of 5 alternative ingredients (O, P, Q, R, and S), which can be used in different proportions in the formulations. The table below gives the composition of these ingredients. The cost per unit of each of these ingredients is O: 150, P: 50, Q: 200, R: 500, S: 100.

Ingredient	Composition			
	Carbohydrate %	Protein %	Fat %	Minerals %
0	50	30	10	10
P	80	20	0	0
Q	10	30	50	10
R	5	50	40	5
S	45	50	0	5

26. For a recuperating patient, the doctor recommended a diet containing 10% minerals and at least 30% protein. In how many different ways can we prepare this diet by mixing at least two ingredients?
    (l) One   (2) Two   (3) Three   (4) Four
    (5) None

27. Which among the following is the formulation having the lowest cost per unit for a diet having 10% fat and at least 30% protein? The diet has to be formed by mixing two ingredients.
    (l) P and Q   (2) P and S   (3) P and R   (4) Q and S
    (5) R and S

28. In what proportion P, Q and S should be mixed to make a diet having at least 60% carbohydrate at the lowest per unit cost?
    (1) 2 : 1 : 3   (2) 4 : 1 : 2   (3) 2 : 1 : 4   (4) 3 : 1: 2
    (5) 4 : 1 : 1

29. The company is planning to launch a balanced diet required for growth needs of adolescent children. This diet must contain at least 30% each of carbohydrate and protein, no more than 25% fat and at least 5% minerals. Which one of the following combinations of equally mixed ingredients is feasible?
    (l) O and P   (2) R and S   (3) P and S   (4) Q and R
    (5) O and S

DIRECTIONS for Questions 30 to 33: Each question is followed by two statements, A and B. Answer each question using the following instructions:

Mark (1) if the question can be answered by using the statement A alone but not by using the statement B alone.
Mark (2) if the question can be answered by using the statement B alone but not by using the statement A alone.

Mark (3) if the question can be answered by using either of the statements alone.

Mark (4) if the question can be answered by using both the statements together but not by either of the statements alone.

Mark (5) if the question cannot be answered on the basis of the two statements.

30. In a particular school, sixty students were athletes. Ten among them were also among the top academic performers. How many top academic performers were in the school?
    A. Sixty per cent of the top academic performers were not athletes.
    B. All the top academic performers were not necessarily athletes.

31. Five students Atul, Bala, Chetan, Dev and Ernesto were the only ones who participated in a quiz contest. They were ranked based on their scores in the contest. Dev got a higher rank as compared to Ernesto, while Bala got a higher rank as compared to Chetan. Chetan's rank was lower than the median. Who among the five got the highest rank?
    A. Atul was the last rank holder.
    B. Bala was not among the top two rank holders.

32. Thirty per cent of the employees of a call centre are males. Ten per cent of the female employees have an engineering background. What is the percentage of male employees with engineering background?
    A. Twenty five per cent of the employees have engineering background.
    B. Number of male employees having an engineering background is 20% more than the number of female employees having an engineering background.

33. In a football match, at the half-time, Mahindra and Mahindra Club was trailing by three goals. Did it win the match?
    A. In the second-half Mahindra and Mahindra Club scored four goals.
    B. The opponent scored four goals in the match.

Directions for Questions 34 to 37: Answer the following questions based on the information given below.

The following table shows the break-up of actual costs incurred by a company in last five years (year 2002 to year 2006) to produce a particular product.

	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006
Volume of production and sale (units)	1000	900	1100	1200	1200
Costs (Rs.)					
Material	50,000	45,100	55,200	59,900	60,000
Labour	20,000	18,000	22,100	24,150	24;000
Consumables	2,000	2,200	1,800	1,600	1,400
Rent of building	1,000	1,000	1,100	1,100	1,200
Rates and taxes	400	400	400	400	400
Repair and maintenance expenses	800	820	780	790	800
Operating cost of machines	30,000	27,000	33,500	36,020	36,000
Selling and marketing expenses	5,750	5,800	5,800	5,750	5,800

The production capacity of the company is 2000 units. The selling price for the year 2006 was Rs. 125 per unit. Some costs change almost in direct proportion to the change in volume of production, while ' others do not follow any obvious pattern of change with respect to the volume of production and hence are considered fixed. Using the information provided for the year 2006 as the basis for projecting the figures for the year 2007, answer the following questions.

34. What is the approximate cost per unit in rupees, if the company produces and sells 1400 units in the year 2007?
    (1) 104   (2) 107   (3) 110   (4) 115
    (5) 116

35. What is the minimum number of units that the company needs to produce and sell to avoid any loss?
    (1) 313   (2) 350   (3) 384   (4) 747
    (5) 928

36. If the company reduces the price by 5%, it can produce and sell as many units as it desires. How many units the company should produce to maximize its profit?
    (1) 1400   (2) 1600   (3) 1800   (4) 1900
   (5) 2000

37. Given that the company cannot sell more than 1700 units, and it will have to reduce the price by Rs.5 for all units, if it wants to sell more than 1400 units, what is the maximum profit, in rupees, that the company can earn?
    (1) 25,400   (2) 24,400   (3) 31,400   (4) 32,900
    (5) 32,000

The proportion of male students and the proportion of vegetarian students in a school are given below. The school has a total of 800 students, 80% of whom are in the Secondary Section and rest equally divided between Class 11 and 12.

	Male (M)	Vegetarian (V)
Class 12	0.6	
Class 11	0.55	0.5
Secondary Section		0.55
Total	0.475	0.53

38. What is the percentage of male students in the secondary section?
    (1) 40   (2) 45   (3) 50   (4) 55
    (5) 60

39. In Class 12, twenty five per cent of the vegetarians are male. What is the difference between the number of female vegetarians and male non-vegetarians?
    (1) less than 8   (2) 10   (3) 12   (4) 14
    (5) 16

40. What is the percentage of vegetarian students in Class 12?
    (1) 40   (2) 45   (3) 50   (4) 55
    (5) 60

41. In the Secondary Section, 50% of the students are vegetarian males. Which of the following statements is correct?
    (1) Except vegetarian males, all other groups have same number of students.
    (2) Except non-vegetarian males, all other groups have same number of students.
    (3) Except vegetarian females, all other groups have same number of students.
    (4) Except non-vegetarian females, all other groups have same number of students.
    (5) All of the above groups have the same number of students.
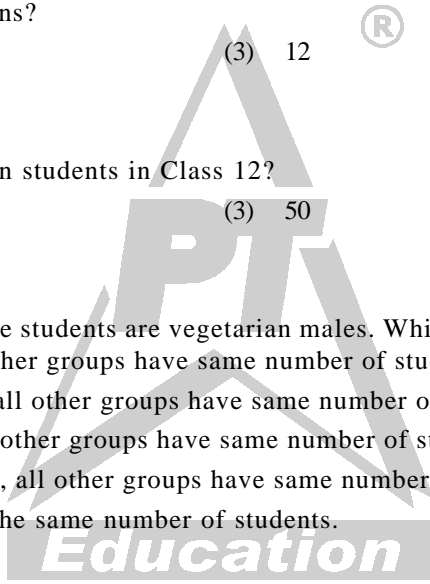
DIRECTIONS for Questions 42 to 45: Answer the following questions based on the information given below.

The Table below shows the comparative costs, in US Dollars, of major surgeries in USA and a select few Asian countries.

Procedure	Comparative Costs in USA and some Asian countries (in US Dollars)				
	USA	India	Thailand	Singapor	Malaysia
Heart Bypass	130000	10000	11000	18500	9000
Heart Valve Replacement	160000	9000	10000	12500	9000
Angioplasty	57000	11000	13000	13000	11000
Hip Replacement	43000	9000	12000	12000	10000
Hysterectomy	20000	3000	4500	6000	3000
Knee Replacement	40000	8500	10000	13000	8000
Spinal Fusion	62000	5500	7000	9000	6000

The equivalent of one US Dollar in the local currencies is given below.

	1 US Dollar equivalent	
India	40.928	Rupees
Malaysia	3.51	Ringits
Thailand	32.89	Bahts
Singapore	1.53	S Dollars

A consulting firm found that the quality of the health services were not the same in all the countries above. A poor quality of a surgery may have significant repercussions in future, resulting in more cost in correcting mistakes. The cost of poor quality of surgery is given in the table below.

Procedure	Comparative Costs of poor quality in USA and some Asian countries (in US Dollars '000)				
	USA	India	Thailand	Singapor	Malaysia
Heart Bypass	0	3	3	2	4
Heart Valve Replacement	0	5	4	5	5
Angioplasty	0	5	5	4	6
Hip Replacement	0	7	5	5	8
Hysterectomy	0	5	6	5	4
Knee Replacement	0	9	6	4	4
Spinal Fusion	0	5	6	5	6

42. A US citizen is hurt in an accident and requires an angioplasty, hip replacement and a knee replacement. Cost of foreign travel and stay is not a consideration since the government will take care of it. Which country will result in the cheapest package, taking cost of poor quality into account?
    (1) India   (2) Thailand   (3) Malaysia   (4) Singapore
    (5) USA

43. Taking the cost of poor quality into account, which country/countries will be the most expensive for knee replacement?
    (1) India   (2) Thailand   (3) Malaysia   (4) Singapore
    (5) India and Singapore

44. Approximately, what difference in amount in Bahts will it make to a Thai citizen if she were to get a hysterectomy done in India instead of in her native country, taking into account the cost of poor quality? It costs 7500 Bahts for one-way travel between Thailand and India.
    (1) 23500   (2) 40500   (3) 57500   (4) 67500
    (5) 75000

45. The rupee value increases to Rs.35 for a US Dollar, and all other things including quality, remain the same. What is the approximate difference in cost, in US Dollars, between Singapore and India for a Spinal Fusion, taking this change into account?
    (1) 700   (2) 2500   (3) 4500   (4) 8000
    (5) No difference
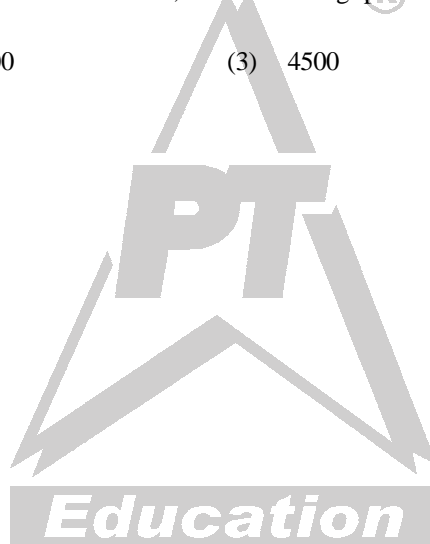
A low-cost airline company connects ten Indian cities, A to J. The table below gives the distance between a pair of airports and the corresponding price charged by the company. Travel is permitted only from a departure airport to an arrival airport. The customers do not travel by a route where they have to stop at more than two intermediate airports.

Sector No.	Airport of Departure	Airport of Arrival	Distance between the Airports (km)	Price (Rs.)
1	A	B	560	670
2	A	C	790	1350
3	A	D	850	1250
4	A	E	1245	1600
5	A	F	1345	1700
6	A	G	1350	2450
7	A	H	1950	1850
8	B	C	1650	2000
9	B	H	1750	1900
10	B	I	2100	2450
11	B	J	2300	2275
12	C	D	460	450
13	C	F	410	430
14	C	G	910	1100
15	D	E	540	590
16	D	F	625	700
17	D	G	640	750
18	D	H	950	1250
19	D	J	1650	2450
20	E	F	1250	1700
21	E	G	970	1150
22	E	H	850	875
23	F	G	900	1050
24	F	I	875	950
25	F	J	970	1150
26	G	I	510	550
27	G	J	830	890
28	H	I	790	970
29	H	J	400	425
30	I	J	460	540

46. What is the lowest price, in rupees, a passenger has to pay for travelling by the shortest route from A to J?
   (1) 2275   (2) 2850   (3) 2890   (4) 2930
   (5) 3340

47. The company plans to introduce a direct flight between A and J. The market research results indicate that all its existing passengers travelling between A and J will use this direct flight if it is priced 5% below the minimum price that they pay at present. What should the company charge approximately, in rupees, for this direct flight?
   (1) 1991   (2) 2161   (3) 2707   (4) 2745
   (5) 2783

48. If the airports C, D and H are closed down owing to security reasons, what would be the minimum price, in rupees, to be paid by a passenger travelling from A to J?
    (1) 2275   (2) 2615   (3) 2850   (4) 2945
    (5) 3190

49. If the prices include a margin of 10% over the total cost that the company incurs, what is the minimum cost per kilometer that the company incurs in flying from A to J?
    (1) 0.77   (2) 0.88   (3) 0.99   (4) 1.06
    (5) 1.08

50. If the prices include a margin of 15% over the total cost that the company incurs, which among the following is the distance to be covered in flying from A to J that minimizes the total cost per kilometer for the company?
    (1) 2170   (2) 2180   (3) 2315   (4) 2350
    (5) 2390

SECTION III

This section contains 25 questions

Directions for Questions 51 to 53: The passage given below is followed by a set of three questions. Choose the **most appropriate** answer to each question.

Human Biology does nothing to structure human society. Age may enfeeble us all, but cultures vary considerably in the prestige and power they accord to the elderly. Giving birth is a necessary condition for being a mother, but it is not sufficient. We expect mothers to behave in maternal ways and to display appropriately maternal sentiments. We prescribe a clutch of norms or rules that govern the *role* of a mother. That the social role is independent of the biological base can be demonstrated by going back three sentences. Giving birth is certainly not sufficient to be a mother but, as adoption and fostering show, it is not even necessary!

The fine detail of what is expected of a mother or a father or a dutiful son differs from culture to culture, but everywhere behaviour is coordinated by the *reciprocal* nature of roles. Husbands and wives, parents and children, employers and employees, waiters and customers, teachers and pupils, warlords and followers; each makes sense only in its relation to the other. The term 'role' is an appropriate one, because the metaphor of an actor in a play neatly expresses the rule-governed nature or scripted nature of much of social life and the sense that society is a joint production. Social life occurs only because people play their parts (and that is as true for war and conflicts as for peace and love) and those parts make sense only in the context of the overall show. The drama metaphor also reminds us of the artistic licence available to the players. We can play a part straight or, as the following from J.P. Sartre conveys, we can ham it up.

Let us consider this waiter in the cafe. His movement is quick and forward, a little too precise, a little too rapid. He comes towards the patrons with a step a little too quick. He bends forward a little too eagerly; his voice, his eyes express an interest a little too solicitous for the order of the customer. Finally there he returns, trying to imitate in his walk the inflexible stiffness of some kind of automaton while carrying his tray with the recklessness of a tightrope-walker....All his behaviour seems to us a game....But what is he playing? We need not watch long before we can explain it: he is playing at being a waiter in a cafe.

The American sociologist Erving Goffman built an influential body of social analysis on elaborations of the metaphor of social life as drama. Perhaps his most telling point was that it is only through acting out a part that we express character. It is not enough to be evil or virtuous; we have to be seen to be evil or virtuous.

There is distinction between the roles we play and some underlying self. Here we might note that some roles are more absorbing than others. We would not be surprised by the waitress who plays the part in such a way as to signal to us that she is much more than her occupation. We would be surprised and offended by the father who played his part 'tongue in cheek'. Some roles are broader and more far-reaching than others. Describing someone as a clergyman or faith healer would say far more about that person than describing someone as a bus driver.

51. What is the thematic highlight of this passage?
    (1) In the absence of strong biological linkages, reciprocal roles provide the mechanism for coordinating human behaviour.
    (2) In the absence of reciprocal roles, biological linkages provide the mechanism for coordinating human behaviour.
    (3) Human behaviour is independent of biological linkages and reciprocal roles.
    (4) Human behaviour depends on biological linkages and reciprocal roles.
    (5) Reciprocal roles determine normative human behavior in society.

52. Which of the following would have been true if biological linkages structured human society?
    (1) The role of mother would have been defined through her reciprocal relationship with her children.
    (2) We would not have been offended by the father playing his role 'tongue in cheek'.
    (3) Women would have adopted and fostered children rather than giving birth to them.
    (4) Even if warlords were physically weaker than their followers, they would still dominate them.
    (5) Waiters would have stronger motivation to serve their customers.

53. It has been claimed in the passage that "some roles are more absorbing than others". According to passage, which of the following seem(s) appropriate reason(s) for such a claim?
    A. Some roles carry great expectations from the society preventing manifestation of the true self.
    B. Society ascribes so much importance to some roles that the conception of self may get aligned with the roles being performed.
    C. Some roles require development of skill and expertise leaving little time for manifestation of self.
    (1) A only   (2) B only
    (3) C only   (4) A & B
    (5) B & C

Directions for Questions 54 to 56: In each question, there are five sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are correct in terms of grammar and usage. Then, choose the **most appropriate** option.

54. A. When I returned to home, I began to read
    B. everything I could get my hand on about Israel.
    C. That same year Israel's Jewish Agency sent
    D. a *Shaliach* a sort of recruiter to Minneapolis.
    E. I became one of his most active devotees.
    (1) C & E   (2) C only
    (3) E only   (4) B, C & E
    (5) C, D & E

55. A. So once an economy is actually in recession,
    B. The authorities can, in principle, move the economy
    C. Out of slump - assuming hypothetically
    D. That they know how to - by a temporary stimuli.
    E. In the longer term, however, such policies have no affect on the overall behaviour of the economy.
    (1) A, B & E   (2) B, C & E
    (3) C & D   (4) E only
    (5) B only

15

56. A. It is sometimes told that democratic
    B. government originated in the city-states
    C. of ancient Greece. Democratic ideals have been handed to us from that time.
    D. In truth, however, this is an unhelpful assertion.
    E. The Greeks gave us the word, hence did not provide us with a model.

    (1) A, B & D   (2) B, C & D
    (3) B & D   (4) B only
    (5) D only

Directions for Questions 57 to 59: The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

Every civilized society lives and thrives on a silent but profound agreement as to what is to be accepted as the valid mould of experience. Civilization is a complex system of dams, dykes, and canals warding off, directing, and articulating the influx of the surrounding fluid element; a fertile fenland, elaborately drained and protected from the high tides of chaotic, unexercised, and inarticulate experience. In such a culture, stable and sure of itself within the frontiers of 'naturalized' experience, the arts wield their creative power not so much in width as in depth. They do not create new experience, but deepen and purify the old. Their works do not differ from one another like a new horizon from a new horizon, but like a madonna from a madonna.

The periods of art which are most vigorous in creative passion seem to occur when the established pattern of experience loosens its rigidity without as yet losing its force. Such a period was the Renaissance, and Shakespeare its poetic consummation. Then it was as though the discipline of the old order gave depth to the excitement of the breaking away, the depth of job and tragedy, of incomparable conquests and irredeemable losses. Adventurers of experience set out as though in lifeboats to rescue and bring back to the shore treasures of knowing and feeling which the old order had left floating on the high seas. The works of the early Renaissance and the poetry of Shakespeare vibrate with the compassion for live experience in danger of dying from exposure and neglect. In this compassion was the creative genius of the age. Yet, it was a genius of courage, not of desperate audacity. For, however elusively, it still knew of harbours and anchors, of homes to which to return, and of barns in which to store the harvest. The exploring spirit of art was in the depths of its consciousness still aware of a scheme of things into which to fit its exploits and creations.

But the more this scheme of things loses its stability, the more boundless and uncharted appears the ocean of potential exploration. In the blank confusion of infinite potentialities flotsam of significance gets attached to jetsam of experience; for everything is sea, everything is at sea -

.... The sea is all about us;
The sea is the land's edge also, the granite
Into which it reaches, the beaches where it tosses
Its hints of earlier and other creation ...

- and Rilke tells a story in which, as in T.S. Eliot's poem, it is again the sea and the distance of 'other creation' that becomes the image of the poet's reality. A rowing boat sets out on a difficult passage. The oarsmen labour in exact rhythm. There is no sign yet of the destination. Suddenly a man, seemingly idle, breaks out into song. And if the labour of the oarsmen meaninglessly defeats the real resistance of the real waves, it is the idle single who magically conquers the despair of apparent aimlessness. While the people next to him try to come to grips with the element that is next to them, his voice seems to bind the boat to the farthest distance so that the farthest distance draws it towards itself. 'I don't know why and how,' is Rilke's conclusion, 'but suddenly I understood the situation of the poet, his place and function in this age. It does not matter if one denies him every place - except this one. There one must tolerate him.'

16

57. In the passage, the expression "like a madonna from a madonna" alludes to
   (A) The difference arising as a consequence of artistic license.
   (B) The difference between two artistic interpretations.
   (C) The difference between 'life' and 'interpretation of life'.
   (D) The difference between 'width' and 'depth' of creative power.
   (E) The difference between the legendary character and the modern day singer.

58. The sea and 'other creation' leads Rilke to
   (1) Define the place of the poet in his culture.
   (2) Reflect on the role of the oarsman and the singer.
   (3) Muse on artistic labour and its aim lessens.
   (4) Understand the elements that one has to deal with.
   (5) Delve into natural experience and real waves.

59. According to the passage, the term "adventurers of experience" refers to
   (1) Poets and artists who are driven by courage.
   (2) Poets and artists who create their own genre.
   (3) Poets and artists of the Renaissance.
   (4) Poets and artists who revitalize and enrich the past for us.
   (5) Poets and artists who delve in flotsam and jetsam in sea.

Directions for Questions 60 to 62: Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the sentence that completes the paragraph in the **most appropriate** way.

60. Characters are also part of deep structure. Characters tie events in a story together and provide a thread of continuity and meaning. Stories can be about individuals, groups, projects or whole organizations, so from an organizational studies perspective, the focal actor(s) determine the level and unit of analysis used in a study. Stories of mergers and acquisitions, for example, are common place. In these stories whole organizations are personified as actors. But these macro-level stories usually are not told from the perspective of the macro-level participants, because whole organizations cannot narrate their experiences in the first person.
   (1) More generally, data concerning the identities and relationships of the characters in the story are required, if one is to understand role structure and social networks in which that process is embedded.
   (2) Personification of a whole organization abstracts away from the particular actors and from traditional notions of level of analysis.
   (3) The personification of a whole organization is important because stories differ depending on who is enacting various events.
   (4) Every story is told from a particular point of view, with a particular narrative voice, which is not regarded as part of the deep structure.
   (5) The personification of a whole organization is a textual device we use to make macro-level theories more comprehensible.

61. Nevertheless, photographs still retain some of the magical allure that the earliest daguerreotypes inspired. As objects, our photographs have changed; they have become physically flimsier as they have become more technologically sophisticated. Daguerre produced pictures on copper plates; today many of our photographs never become tangible thins, but instead remain filed away on computers and cameras, part of the digital ether that envelops the modern world. At the same time, our patience for the creation of images has also eroded. Children today are used to being tracked from birth by digital cameras and video recorders and they expect to see the results of their poses and performances instantly. The space between life as it is being lived and life as it is being displayed shrinks to a mere second.

    (1) Yet, despite these technical developments, photographs still remain powerful because they are reminders of the people and things we care about.

    (2) Images, after all, are surrogates carried into battle by a soldier or by a traveller on holiday.

    (3) Photographs, be they digital or traditional, exist to remind us of the absent, the beloved, and the dead.

    (4) In the new era of the digital image, the images also have a greater potential for fostering falsehood and trickery, perpetuating fictions that seem so real we cannot tell the difference.

    (5) Anyway, human nature being what it is, little time has passed after photography's inventions became means of living life through images.

62. Mma Ramotswe had a detective agency in Africa, at the foot of Kgale Hill. These were its assets; a tiny white van, two desks, two chairs, a telephone, and an old typewriter. Then there was a teapot, in which Mma Ramotswe - the only private lady detective in Botswana - brewed red bush tea. And three mugs - one for herself, one for her secretary and one for the client. What else does a detective agency really nee? Detective agencies rely on human intuition and intelligence, both of which Mma Ramotswe had in abundance.

    (1) But there was also the view, which again would appear on no inventory.

    (2) No inventory would ever include those, of course.

    (3) She had an intelligent secretary too.

    (4) She was a good detective and a good woman.

    (5) What she lacked in possessions was more than made up by a natural shrewdness.

Directions for Questions 63 to 65: The passage given below is followed by a set of three questions. Choose the **most appropriate** answer to each question.

To discover the relation between rules, paradigms, and normal science, consider first how the historian isolates the particular loci of commitment that have been described as accepted rules. Close historical investigation of a given specialty at a given time discloses a set of recurrent and quasi-standard illustrations of various theories in their conceptual, observational, and instrumental applications. These are the community's paradigms, revealed in its textbooks, lectures, and laboratory exercises. By studying them and by practicing with them, the members of the corresponding community learn their trade. The historian, of course, will discover in addition a penumbral area occupied by achievements whose status is still in doubt, but the core of solved problems and techniques will usually be clear. Despite occasional ambiguities, the paradigms of a mature scientific community can be determined with relative ease.

That demands a second step and one of a somewhat different kind. When undertaking it, the historian must compare the community's paradigms with each other and with its current research reports. In doing so, his object is to discover what isolable elements, explicit or implicit, the members of that community may have abstracted from their more global paradigms and deploy it as rules in their research. Anyone who has attempted to describe or analyze the evolution of a particular scientific tradition will necessarily have sought accepted principles and rules of this sort. Almost certainly, he will have met with at least partial success. But, if his

experience has been at all like my own, he will have found the search for rules both more difficult and less satisfying than the search for paradigms. Some of the generalizations he employs to describe the community's shared beliefs will present more problems. Others, however, will seem a shade too strong. Phrased in just that way, or in any other way he can imagine, they would almost certainly have been rejected by some members of the group he studies. Nevertheless, if the coherence of the research tradition is to be understood in terms of rules, some specification of common ground in the corresponding area is needed. As a result, the search for a body of rules competent to constitute a given normal research tradition becomes a source of continual and deep frustration.

Recognizing that frustration, however, makes it possible to diagnose its source. Scientists can agree that a Newton, Lavoisier, Maxwell, or Einstein has produced an apparently permanent solution to a group of outstanding problems and still disagree, sometimes without being aware of it, about the particular abstract characteristics that make those solutions permanent. They can, that is, agree in their identification of a paradigm without agreeing on, or even attempting to produce, a full interpretation or rationalization of it. Lack of a standard interpretation or of an agreed reduction to rules will not prevent a paradigm from guiding research. Normal science can be determined in part by the direct inspection of paradigms, a process that is often aided by but does not depend upon the formulation of rules and assumption. Indeed, the existence of a paradigm need not even imply that any full set of rules exists.

63. What is the author attempting to illustrate through this passage?
    (1) Relationships between rules, paradigms, and normal science
    (2) How a historian would isolate a particular 'loci of commitment'
    (3) How a set of shared beliefs evolve in to a paradigm.
    (4) Ways of understanding a scientific tradition
    (5) The frustrations of attempting to define a paradigm of a tradition

64. The term 'loci of commitment' as used in the passage would most likely correspond with which of the following?
    (1) Loyalty between a group of scientists in a research laboratory
    (2) Loyalty between groups of scientists across research laboratories
    (3) Loyalty to a certain paradigm of scientific inquiry
    (4) Loyalty to global patterns of scientific inquiry
    (5) Loyalty to evolving trends of scientific inquiry

65. The author of this passage is likely to agree with which of the following?
    (1) Paradigms almost entirely define a scientific tradition.
    (2) A group of scientists investigating a phenomenon would benefit by defining a set of rules.
    (3) Acceptance by the giants of a tradition is a sine qua non for a paradigm to emerge.
    (4) Choice of isolation mechanism determines the types of paradigm that may emerge from a tradition.
    (5) Paradigms are a general representation of rules and beliefs of a scientific tradition.

Directions for Questions 66 to 68: In each question, there are four sentences. Each sentence has pairs of words/phrases that are italicized and highlighted. From the italicized and highlighted word(s)/phrase(s), select the **most appropriate** word(s)/phrase(s) to form correct sentences. Then, from the options given, choose the best one.

66. The cricket council that was [A] / were [B] elected last March is [A] / are [B] at sixes and sevens over new rules.

    The critics censored [a] / censured [B] the new movie because of its social inaccessibility.

    Amit's explanation for missing the meting was credulous [A] / credible [B]

    She coughed discreetly [A] / discretely [B] to announce her presence.

    (1) BBAAA   (2) AAABA

    (3) BBBBA   (4) AABBA

    (5) BBBAA

67. The further [A] / farther [B] he pushed himself, the more disillusioned he grew.

    For the crowds it was more of a historical [A] / historic [B] event; for their leader, it was just another day.

    The old man has a healthy distrust [A] / mistrust [B] for all new technology.

    This film is based on a real [A] / true [B] story.

    One suspects that the compliment [A] / complement [B] was backhanded

    (1) BABAB   (2) ABBBA

    (3) BAABA   (4) BBAAB

    (5) ABABA

68. Regrettably [A] / Regretfully [B] I have to decline your invitation.

    I am drawn to the poetic, sensual [A] / sensuous [B] quality of her paintings.

    He was besides [A] / beside [B] himself with rage when I told him what I had done.

    After brushing against a stationary [A] / stationery [B] truck my car turned turtle.

    As the water began to rise over [A] / above [B] the danger mark, the signs of an imminent flood were clear.

    (1) BAABA   (2) BBBAB

    (3) AAABA   (4) BBAAB

    (5) BABAB

Directions for Questions 69 to 71: The passage given below is followed by a set of three questions. Choose the **most appropriate** answer to each question.

The difficulties historians face in establishing cause-and-effect relations in the history of human societies are broadly similar to the difficulties facing astronomers, climatologists, ecologists, evolutionary biologists, geologists, and palaeontologists. To varying degrees each of these fields is plagued by the impossibility of performing replicated, controlled experimental interventions, the complexity arising from enormous numbers of variables, the resulting uniqueness of each system, the consequent impossibility of formulating universal laws, and the difficulties of predicting emergent properties and future behaviour. Prediction in history, as in other historical sciences, is most feasible on large spatial scales and over long times, when the unique features of millions of small-scale brief events become averaged out. Just as I could predict the sex ratio of the next 1,000 newborns but not the sexes of my own two children, the historian can recognize factors that made

inevitable the broad outcome of the collision between American and Eurasian societies after 13,000 years of separate developments, but not the outcome of the 1960 U.S. presidential election. The details of which candidate said what during a single televised debate in October 1960 Could have given the electoral victory to Nixon instead of to Kennedy, but no details of who said what could have blocked the European conquest of Native Americans.

How can students of human history profit from the experience of scientists in other historical sciences? A methodology that has proved useful involves the comparative method and so-called natural experiments. While neither astronomers studying galaxy formation nor human historians can manipulate their systems in controlled laboratory experiments, they both can take advantage of natural experiments, by comparing systems differing in the presence or absence (or in the strong or weak effect) of some putative causative factor. For example, epidemiologists, forbidden to feed large amounts of salt to people experimentally, have still been able to identify effects of high salt intake by comparing groups of humans who already differ greatly in their salt intake; and cultural anthropologists, unable to provide human groups experimentally with varying resource abundances for many centuries, still study long-term effects of resource abundance on human societies by comparing recent Polynesian populations living on islands differing naturally in resource abundance.

The student of human history can draw on many more natural experiments than just comparisons among the five inhabited continents. Comparisons can also utilize large islands that have developed complex societies in a considerable degree of isolation (such as Japan, Madagascar, Native American Hispaniola, New Guinea, Hawaii, and many others), as well as societies on hundreds of smaller islands and regional societies within each of the continents. Natural experiments in any field, whether in ecology or human history, are inherently open to potential methodological criticisms. Those include confounding effects of natural variation in additional variables besides the one of interest, as well as problems in inferring chains of causation from observed correlations between variables. Such methodological problems have been discussed in great detail for some of the historical sciences. In particular, epidemiology, the science of drawing inferences about human diseases by comparing groups of people (often by retrospective historical studies), has for a long time successfully employed formalized procedures for dealing with problems similar to those facing historians of human societies.

In short, I acknowledge that it is much more difficult to understand human history than to understand problems in fields of science where history is unimportant and where fewer individual variables operate. Nevertheless, successful methodologies for analyzing historical problems have been worked out in several fields. As a result, the histories of dinosaurs, nebulae, and glaciers are generally acknowledged to belong to fields of science rather than to the humanities.

69. Why do islands with considerable degree of isolation provide valuable insights into human history?
    (1) Isolated islands may evolve differently and this difference is of interest to us.
    (2) Isolated islands increase the number of observations available to historians.
    (3) Isolated islands, differing in their endowments and size may evolve differently and this difference can be attributed to their endowments and size.
    (4) Isolated islands, differing in their endowments and size, provide a good comparison to large islands such as Eurasia, Africa, Americas and Australia.
    (5) Isolated islands, in so far as they are inhabited, arouse curiosity about how human beings evolved there.

70. According to the author, why is prediction difficult in history?
    (1) Historical explanations are usually broad so that no prediction is possible.
    (2) Historical out comers depend upon a large number of factors and hence predictions is difficult for each case.
    (3) Historical sciences, by their very nature, are not interested in a multitude of minor factors, which might be important in a specific historical outcome.
    (4) Historians are interested in evolution of human history and hence are only interested in log term predictions.
    (5) Historical sciences suffer from the inability to conduct controlled experiments are therefore have explanations based on a few long term factors.

71. According to the author, which of the following statements would be true?
    (1) Students of history are missing significant opportunities by not conducting any natural experiments.
    (2) Complex societies inhabiting large islands provide great opportunities for natural experiments.
    (3) Students of history are missing significant opportunities by not studying an adequate variety of natural experiments.
    (4) A unique problem faced by historians is their inability to establish cause and effect relationships.
    (5) Cultural anthropologists have overcome the problem of confounding variables through natural experiments.

Directions for Questions 72 to 75: In each question, there are five sentences/paragraphs. The sentence/paragraph labelled A is in its correct place. The four that follow are labelled B, C, D and E, and need to be arranged in the logical order to form a coherent paragraph/passage. From the given options, choose the **most appropriate** option.

72. A. In America, highly educated women, who are in stronger position in the labour market than less qualified ones, have higher rates of marriage than other groups.
    B. Some works supports the Becker thesis, and some appears to contradict it.
    C. And, as with crime, it is equally inconclusive.
    D. But regardless of the conclusion of any particular piece of work, it is hard to establish convincing connections between family changes and economic factors using conventional approaches.
    E. Indeed, just as with crime, an enormous academic literature exists on the validity of the pure economic approach to the evolution of family structures.
    (1) BCDE   (2) DBEC
    (3) BDCE   (4) ECBD
    (5) EDCD

73. A. Personal experience of mothering and motherhood are largely framed in relation to two discernible or "official" discourses; the "medical discourse and natural childbirth discourse". Both of these tend to focus on the "optimistic stories" of birth and mothering and underpin stereotypes of the "godmother".

   B. At the same time, the need for medical expert guidance is also a feature for contemporary reproduction and motherhood. But constructions of good mothering have not always been so conceived and in different contexts may exist in parallel to other equally dominant discourses.

   C. Similarly, historical work has shown how what are now taken for granted aspects of reproduction and mothering practices result from contemporary "pseudoscientific directives" and "managed constructs". These changes have led to a reframing of modern discourses that pattern pregnancy and motherhood leading to an acceptance of the need for greater expert management.

   D. The contrasting, overlapping and ambiguous strands with in these frameworks focus to varying degrees on a woman's biological tie to her child and predisposition to instinctively know and be able to care for her child.

   E. In addition, a third, "unofficial popular discourse" comprising "old wives" tales and based on maternal experiences of childbirth has also been noted. These discourses have also been acknowledged in work exploring the experiences of those who apparently do not "conform" to conventional stereotypes of the "good mother"?

   (1) EDBC   (2) BCED
   (3) DBCE   (4) BCDE

74. A. Indonesia has experienced dramatic shifts in its formal governance arrangements since the fall of President Soeharto and the close of his centralized, authoritarian "New Order" regime in 1997.

   B. The political system has taken its place in the nearly 10 years since Reformasi began. It has featured the active contest for political office among a proliferation of parties at central, provincial and district levels; direct elections for the presidency (since 2004); and radical changes in centre-local government relations towards administrative, fiscal, and political decentralization.

   C. The mass media, once tidily under Soeharto's thumb, has experienced significant liberalization, as has the legal basis for non-governmental organizations, including many dedicated to such controversial issues as corruption control and human rights.

   D. Such developments are seen optimistically by a number of donors and some external analysts, who interpret them as signs of Indonesia's political normalization.

   E. A different group of analysts paint a picture in which the institutional forms have changed, but power relations have not. Vedi Hadiz argues that Indonesia's "democratic transition" has been anything but linear.

   (1) BDEC   (2) CBDE
   (3) CEBD   (4) DEBC
   (5) BCDE

75. A. I had six thousand acres of land, arid had thus got much spare land besides the coffee plantation. Part of the farm was native forest, and about one thousand acres were squatters' land, what [the Kikuyu] called their shambas.

   B. The squatters' land was more intensely alive than the rest of the farm, and was changing with the seasons the year round. The maize grew up higher than your head as you walked on the narrow hard-trampled footpaths in between the tall green rustling regiments.

   C. The squatters are Natives, who with their families hold a few acres on a white man's farm, and in return have to work for him a certain number of days in the year. -My squatters, I think, saw the relationship in a different light, for many of them were born on the farm, and their fathers before them, and they very likely regarded me as a sort of superior squatter on their estates.

   D. The Kikuyu also grew the sweet potatoes that have a vine like leaf and spread over the ground like a dense entangled mat, and many varieties of big yellow and green speckled pumpkins.

   E. The beans ripened in the fields, were gathered and thrashed by the women, and the maize stalks and coffee pods were collected and burned, so that in certain seasons thin blue columns of smoke rose here and there all over the farm.

   (1) CBDE (2) BCDE
   (3) CBED (4) DBCE
   (5) EDBC

Detailed Solutions

1. $X = \dfrac{3+5+7+.....+2n+1}{n}$

   $Y = \dfrac{2+4+6+....+2n}{n}$

   $X - Y = \dfrac{(3+5+7+....+2n+1)}{n} - \dfrac{(2+4+6....+2n)}{n}$

   $= \dfrac{(3-2)+(5-4)+....+[(2n+1)-2n]}{n}$

   $= \dfrac{1+....(n\,times)}{n}$

   $= \dfrac{n}{n} = 1$ **Ans. 1**

2. Ten years ago the total age of 8 members = 231
   Today the age of 8 people = 231 + 80 = 311
   Total age after 3 years when a man of 60 year died = 311 + 24 – 60 = 275
   Again after 3 year, the total age when one more member died = 275 + 24 – 60 = 239
   So the current total age = 239 – 48 = 191

   ∴ The average age $= \dfrac{191}{8} = 24(\text{approx})$ **Ans. 24**

3. f(1) = 3600. for n = 2.
   f(1) + f(2) = 2² f(2) = 4f(2)

   $f(2) = \dfrac{f(1)}{3} = \dfrac{3600}{3} = 1200$

   f(1) + f(2) + f(3) = 9 f(3)
   8 f(3) = 4800
   f(3) = 600.
   f(1) + f(2) + f(3) + f(4) = 16 f(4)

   $f(4) = \dfrac{5400}{15} = 360$

   f(1) + f(2) + f(3) + f(4) + f(5) = 25 f(5)

   $f(5) = \dfrac{5760}{24} = 240$

   f(1) + f(2) + f(3) + f(4) + f(5) + f(6) = 36 f(6)

   $f(6) = \dfrac{6000}{35} = 171 \text{approx.}$

$f(1) + f(2) + f(3) + f(4) + f(5) + f(6) + f(7) = 49 \, f(7)$

$$f(7) = \frac{6171}{48} = 128.5 \, \text{approx.}$$

$f(1) + f(2) + f(3) + f(4) + f(5) + f(6) + f(7) + f(8) = 64 \, f(8)$

$$f(8) = \frac{6299.5}{63} = 100 \, \text{approx.}$$

$f(1) + f(2) + f(3) + f(4) + f(5) + f(6) + f(7) + f(8) + f(9) = 81 \, f(9)$

$$f(9) = \frac{6400}{80} = 80 \, \text{approx.} \quad \textbf{Ans. 80}$$

4. $x + 10y + 50z = 107$

No of cases will be

	x	y	z
1	107	0	0
2	97	1	0
3	87	2	0
4	77	3	0
5	67	4	0
6	57	5	0
7	47	6	0
8	37	7	0
9	27	8	0
10	17	9	0
11	7	10	0
12	57	0	1
13	47	1	1
14	37	2	1
15	27	3	1
16	17	4	1
17	7	5	1
18	7	0	2

Total No. of Cases = 18 **Ans. 18**

5. Let x rupees & y paise.

Should be Cashed.

∴ the amount she should get is $100x + y$ but she got $100y + x$.

and also, $(100y + x) - 50 = 3(100x + y)$

$97y - 299x = 50$

$97y = 50 + 299x$

$$y = \frac{299x + 50}{97}$$

$$= \frac{299x + 8x + 50}{91}$$

$$=3x + \frac{8x + 50}{97}$$

Now working back from the option if we put x = 18 the only y will be integer.

y = 56 paise.

Total amount is 18.56 paise. **Ans. Over Rupees 18 but less than Rupees 19**

6. Given equation can be written as

12(n + 4m) = mn

12n + 48m – mn – 576 + 576 = 0

n(12 – m) – 48 (12 – m) = –576.

(12 – m) (n – 48) = – 576.

As n is odd ∴ n – 48 is also odd. But –576 is even, therefore (12 – m) is definitely even.

We can write above eqn. as

(12 – m) (n – 48) = – 192 × 3

or (12 – m) (n – 48) = – 64 × 9

or (12 – m) (n – 48) = – 576 × 1

⟹ n – 48 = 3 ⟹ n = 51

or n – 48 = 9 ⟹ n = 57

or n – 48 =1 ⟹ n = 49

∴ There are three values of n. **Ans. 3**

7. Total weight of class 4500 kg.

Let the average weight of section I and II be x and y respectively, where x < y.

With the given change average of section I will be.

$$\frac{50x + D - P}{50} = y \ \text{[where D is the weight of Deepak and P of Poonam]}$$

and of section II will be

$$\frac{50y - D + P}{50} = x$$

Also total weight = 50x + 50y = 4500

⟹ x + y = 90   (1)

Statement A says y – x = 1   (2)

from (1) and (2) y = 45.5 x = 44.5

But these does not gives the exact age of Deepak and Poonam, we only get D – P = 50.   (3)

From statement (B)

$$\frac{50x + D}{51} = \frac{50y - D}{49} \Rightarrow 10D = 255y - 245x.$$

Which does not gives age of Poonam combining (A) & (B), we get

10D = 255 (45.5) – 245 (44.5)   (4)

11602 – 10902.5

10D = 700

D = 70 from (3) P = 20

Ans. So by Combining (A) and (B) we get the solution

8. Outer radius = 5 m

By statement (A) inner radius is at least 4 meters.

So the volume of tank is in the range:

$$\frac{4}{3} \times 3.14 \times 4^3 < V < \frac{4}{3} \times 3.14 \times 5^3$$

$268.8 < V < 525$ (approx)

We can not say that the tank capacity will be adequate to meet the required

By statement (B)

Volume of tank $= \dfrac{30,000 \text{kg}}{3 \text{gm} / \text{cc}} = 30$ cubic meter.

$$\frac{4}{3}\pi(V_o{}^3 - V_1{}^3) = 30 \text{cum}.$$

$$525 - \frac{4}{3}\pi V_1{}^3 = 30 \text{cum}$$

$$\frac{4}{3}\pi V_1{}^3 = 495 \text{cum}$$

Thus Tanks capacity is adequate.

Hence statement (B) alone is sufficient.

9. The value of $x^2 + y^2 + z^2$ will be minimum when $x = y = z$ which is not possible

So we take the case $x = 30$, $y = 30$, $z = 29$

Here the value of $x^2 + y^2 + z^2$ will be minimum.

No other value of x, y, z will provide the minimum sum of $x^2 + y^2 + z^2$

And statement (B) does not provide any additional information.

Ans. So only statement (A) alone is sufficient to answer the question.

10. If JKLM is Square and O is any point on JK then the maximum value of OM can be $\sqrt{2}$ times of OL when O

concide with K and KM becomes diagonal so at the most it will be $\sqrt{2}$ times of side and therefore can never be two times. And statement B does not give any usefull information.

Ans. So only statement (A) alone is sufficient to answer the question.

11. Given :

1. The distance between A and B is 3000 km.

2. A is east of B.

3. All the times indicated are local and on the same day.

Let, the speed of planes = x kmph and time zone of B is 'a' hours ahead of time zone of A (which means if there are 3:00 pm at A, there will be (3+a):00 pm at B)

Now by the conditions given in questions

$$7 - a = \frac{3000}{x - 50} \qquad ....(1)$$

$$4 + a = \frac{3000}{x + 50} \qquad ....(2)$$

By solving equation (1) and (2) simultaneously

we get $11x^2 - 6000x - 27500 = 0$ which gives $x = 550$ and $-50/11$(not possible) and $a = 1$.

Short-cut: Now by putting the value of option (1) of this question as 'a' in equation (1) we get

$x = \dfrac{6000}{11} + 50$, which do not satisfy any option of the next question

By putting the value of option (2) of this question as 'a' in equation (1) we get $x = 650$, which also not satisfy any option of next question

By putting the value of option (3) of this question as 'a' in equation (1) we get $x = \dfrac{2000}{3} + 50$, which do not satisfy any option of next question

By putting the value of option (4) of this question as 'a' in equation (1) we get $x = 550$, which is the second option of next question. **Ans. 1 hour**

12. Given :

1. The distance between A and B is 3000 km.

2. A is east of B.

3. All the times indicated are local and on the same day.

Let, the speed of planes = x kmph and time zone of B is 'a' hours ahead of time zone of A (which means if there are 3:00 pm at A, there will be (3+a):00 pm at B)

Now by the conditions given in questions

$7 - a = \dfrac{3000}{x - 50}$ ....(1)

$4 + a = \dfrac{3000}{x + 50}$ ....(2)

By solving equation (1) and (2) simultaneously

we get $11x^2 - 6000x - 27500 = 0$ which gives $x = 550$ and $-50/11$(not possible) and $a = 1$.

Short-cut: Now by putting the value of option (1) of this question as 'a' in equation (1) we get

$x = \dfrac{6000}{11} + 50$, which do not satisfy any option of the next question

By putting the value of option (2) of this question as 'a' in equation (1) we get $x = 650$, which also not satisfy any option of next question

By putting the value of option (3) of this question as 'a' in equation (1) we get $x = \dfrac{2000}{3} + 50$, which do not satisfy any option of next question

By putting the value of option (4) of this question as 'a' in equation (1) we get $x = 550$, which is the second option of next question. **Ans. 550 kmph**

13. To maximize the guaranteed returns risk is minimum along with profit %.

If equal amount is invested in all three options then there is a chance of loss, return is not guaranteed.

Working from options of Q.no.14 (since both question are linked) if 36% is invested in option B and 64% in option C then in case of rise in stock market return is 5% of 36 – 2.5% of 64 = 0.20% and in case of fall in stock market = 2% of 64 – 3% of 36 = 1.28 – 1.08 = 0.20%, in all other cases values will be less than it.

Ans. 0.20%

14. To maximize the guaranteed returns risk is minimum along with profit %.

If equal amount is invested in all three options then there is a chance of loss, return is not guaranteed.

Working from options if 36% is invested in option B and 64% in option C then in case of rise in stock market return is 5% of 36 – 2.5% of 64 = 0.20% and in case of fall in stock market = 2% of 64 – 3% of 36 = 1.28 – 1.08 = 0.20%, in all other cases values will be less than it.

Ans. 36% in option B and 64% in option C.

15. Any member of 5 includes two elements, so its enemies are formed from the selection of two elements from remaining n – 2.

i.e. $^{n-2}C_2 = \dfrac{(n-2)(n-3)}{2} = \dfrac{1}{2}(n^2 - 5n + 6)$

Ans. $\dfrac{1}{2}(n^2 - 5n + 6)$

16. With the common element of the friends (n – 3) pairs are possible and one pair will be formed from the uncommon elements.

So total = n – 3 + 1 = n – 2

Ans. n – 2

17. If the total number of players in each of the n teams be 'k', then total players in the tournament will be nk. But as one player is common in following pairs i.e., T_1 and T_2, T_2 and T_3 ..... T_n and T_1, therefore we can say that there are n players who are common. Therefore total number of players participating

nk – n = n(k–1). **Ans. n(k–1)**

18. Let the four digit number be xxyy.

$\Rightarrow 1000x + 100x + 10y + y$

$\Rightarrow 1100x + 11y$

$\Rightarrow 11(100x + y)$

If this has to be a perfect square 100 x + y must be of the form 11p where p is a perfect square.

$\therefore 100x + y = 11p$

$\Rightarrow y = 11p - 100x$

As x & y are single digit positive integers we will have to look for the solution which satisfies this equation. If p = 16

y = 11 × 16 – 100 x

y = 156 – 100 x

If we take x = 15 then only we get y as 6. But in that case x is two digit no. which is contradiction.
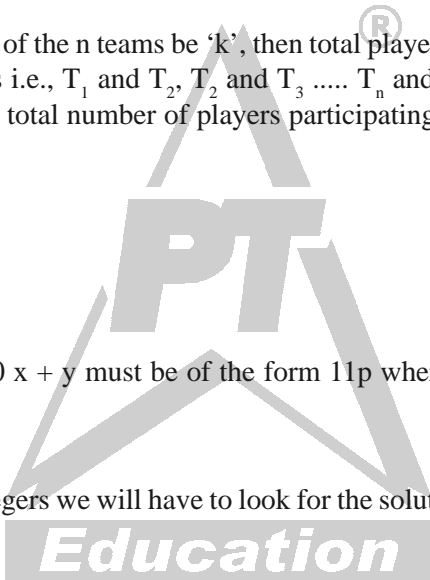
p = 25

y = 11 × 25 – 100 x = 275 – 100 x

here at the max x can be 2 but in that case y is 75 which is not possible. Similarly checking for other perfect square we get solution only at p = 64

y = 11 × 64 – 100 x = 704 – 100 x

If we put x = 7 we get y = 4. Hence the only no. which satisfies this is 7744. **Ans. 1**

19. Cost function $c(x) = cx^2 + bx + 240$

When production changes from 20 to 40.

$[c(40)^2 + b(40) + 240] - [c(20)^2 + b(20) + 240]$

$= \dfrac{2}{3}[c(20)^2 + b(20) + 240]$

On solving we get

$140\,c + b = 24$ .....(1)

When production changes from 40 to 60

$[c(60)^2 + b(60) + 240] - [c(40)^2 + b(40) + 240]$

$= \dfrac{1}{2}[c(40)^2 + b(40) + 240]$

$\Rightarrow 2400\,c = 240 \Rightarrow c = 1/10$

On substituting in eq (1)

$14 + b = 24 \Rightarrow b = 10$

Profit equals $p(x) = $ Sales – Cost

$p(x) = 30x - \left(\dfrac{x^2}{10} + 10x + 240 \right)$

$p(x) = -\dfrac{x^2}{10} + 20x - 240.$

On differentiating and putting equal to zero.

$\dfrac{-2x}{10} + 20 = 0$

$\Rightarrow x = 100.$

Profit $p(x)$ at 100.

$= -1000 + 2000 - 240$

$= 760$

Ans. 100

20. Cost function $c(x) = cx^2 + bx + 240$

When production changes from 20 to 40.

$[c(40)^2 + b(40) + 240] - [c(20)^2 + b(20) + 240]$

$= \dfrac{2}{3}[c(20)^2 + b(20) + 240]$

On solving we get

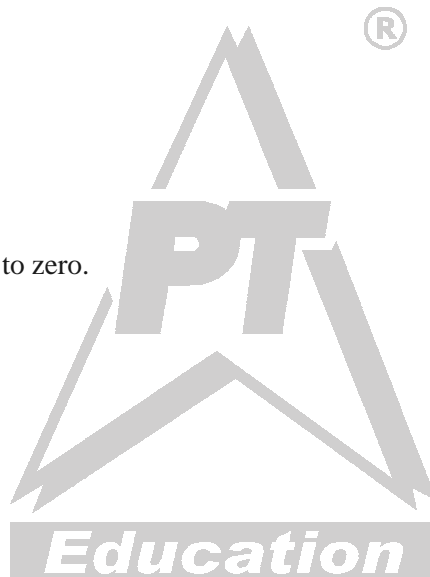$140\,c + b = 24$ .....(1)

When production changes from 40 to 60

$[c(60)^2 + b(60) + 240] - [c(40)^2 + b(40) + 240]$

$= \dfrac{1}{2}[c(40)^2 + b(40) + 240]$

$\Rightarrow 2400\,c = 240 \Rightarrow c = 1/10$

On substituting in eq (1)

$14 + b = 24 \Rightarrow b = 10$

Profit equals p(x) = Sales – Cost

$$p(x) = 30x - \left(\frac{x^2}{10} + 10x + 240 \right)$$

$$p(x) = -\frac{x^2}{10} + 20x - 240.$$

On differentiating and putting equal to zero.

$$\frac{-2x}{10} + 20 = 0$$

$\Rightarrow$ x = 100.

Profit p(x) at 100.

= –1000 + 2000 – 240

=760

Ans. 760

21. After 100 days the price of Darzeeling tea is constant equal to 100 + 0.10 n = 100 + 10 = 110 price, of Ooty tea on 100th day is 89 + 0.15 (100) = 104.

Now the price of Darzeeling tea is constant so the price will be equal when 89 + 0.15 n = 110

$$\Rightarrow n = \frac{21}{0.15} = 140$$

On 140th day the prices will be equal i.e. 20th May. **Ans. May 20.**

22. For P and Q to be outside the intersection past condition is distance between centre PQ follows:

r < PQ < 2r

When PQ $\rightarrow$ r.

$\angle$ AQP $\rightarrow$ 60 and when PQ $\rightarrow$ 2r $\angle$ AQP $\rightarrow$ 0

0 < $\angle$ AQP < 60°. **Ans. Between 0 and 60**

23. Let f(x) = ax^2 + bx + c at x = 1 it has max value = 3

a + b + c = 3   (1)

at x = 0, f(x) = 1

$\Rightarrow$ c = 1

a + b = 2

Differentiating f(x) we get 2ax + b = 0

$$x = \frac{-b}{2a} = 1 - b = 2a$$

a + b = 2

a – 2a = 0

a = – 2 & b = 4

f(10) = 100a + 10b + 1 = – 200 + 40 + 1 = – 159.

Ans. –159.

24. Given $a_1 = p$, $b_1 = q$.

According to given conditions.

For n = 2.

$\quad a_2 = pb_1$, $b_2 = qb_1$

For n = 3

$\quad a_3 = pa_2$,

$\quad a_3 = p^2 b_1 = p^2 q$

$\quad b_3 = qa_2$

$\quad b3 = qa_2 = qpb_1$

$\quad\quad\quad = q^2 p$.

For n = 4

$\quad a_4 = pb_3$, $b_4 = qb_3$

$\quad a_n + b_n$, for n = 4

$\quad a_4 + b_4 = b_3(p + q)$

$\quad\quad\quad = q^2 p(p + q)$

Ans. $q(pq)^{\frac{1}{2}n-1}(p+q)$

25. Given

$\quad a_n = pb_n - 1$, $b_n = q\, b_n - 1$ for even n > 1

$\quad a_n = pa_n - 1$, $b_n = q\, a_n - 1$ for odd n > 1

$\quad a_1 = p$ and $b_1 = q$

For n = 2

$\Rightarrow a_2 = pb_1 \qquad\qquad b_2 = qb_1$

$\quad\quad = pq \qquad\qquad\quad = (q)^2$

n = 3

$\Rightarrow a_3 = pa_2 \qquad\qquad b_3 = q\, a_2$

$\quad\quad = p^2q \qquad\qquad b_3 = q^2p$

n = 4

$\Rightarrow a_4 = pb_3 \qquad\qquad b_4 = qb_3$

$\quad\quad = p^2q^2 \qquad\qquad = q^3 p$

n = 5

$\Rightarrow a_5 = pa_4 \qquad\qquad b_5 = q\, a_4$

$\quad\quad = p^3 q^2 \qquad\qquad b_5 = p^2q^3$

Finding $a_n + b_n$ for different n from above:

$a_1 + b_1 = p + q$

$a_2 + b_2 = pq + q^2 = q(p + q)$
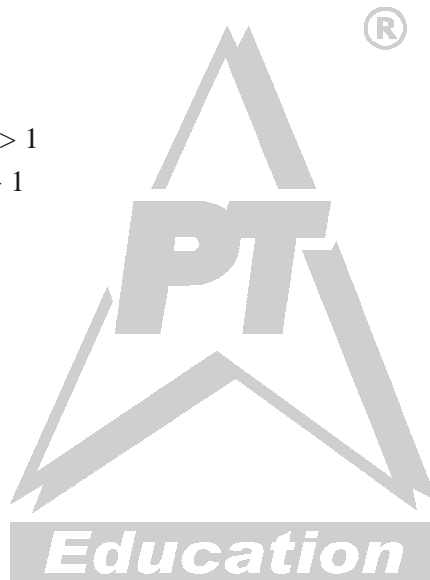
$a_3 + b_3 = pq(p + q)$

$a_4 + b_4 = pq^2(p + q)$

$a_5 + b_5 = p^2q^2(p + q)$

$a_6 + b_6 = p^2q^3(p + q)$

$a_7 + b_7 = p^3q^3(p + q)$

$a_8 + b_8 = p^3q^4 (jp + q)$

$a_9 + b_9 = p^4q^4 (p + q)$

$a_{10} + b_{10} = p^4q^5 (p + q)$

$a_{11} + b_{11} = p^5q^5 (p + q)$

$a_{12} + b_{12} = p^5q^6 (p + q)$

$a_{13} + b_{13} = p^6q^6 (p + q)$

$a_{14} + b_{14} = p^6q^7 (p + q)$

$a_{15} + b_{15} = p^7q^7 (p + q)$

and it is given in question that $p = \dfrac{1}{3}$ and $q = \dfrac{2}{3}$

Now checking options for n = 7 :

$a_n + b_n = a_7 + b_7 = p^3q^3 (kp + q) = \left(\dfrac{2}{9}\right)^3 (1) = \dfrac{8}{729} \cong 0.0109 > 0.01$ hence this option is eliminated

(4) For n = 9

$a_9 + b_9 = \left(\dfrac{1}{3}\right)^4 \left(\dfrac{2}{3}\right)^4 \left(\dfrac{1}{3} + \dfrac{2}{3}\right) = \dfrac{16}{6561} = 0.0024 < 0.01$ **Ans. 9**

26. A diet containing 10% minerals will be obtained only by mixing O and Q in equal proportion.

    Hence **Ans. One**

27. Let 1 unit = 10 gms.

    Desired 10 % fat and at least 30% protein P and Q will give protein as less than 30% (by alligation rule) P and S will give fat as 0%.

    To get 10% fat P and R will have to be mixed in the ratio 3 : 1 but in the mixture protein will not be at least 30%.

    Similarly, to get 10% fat R and S will be mixed in the ratio 1 : 3 and the cost will be Rs.200/unit.

    If, we mix Q and S in ratio 1 : 4.

    Fat – 10% protein will be at least 30% and cost will Rs.120/unit. **Ans. (Q and S)**

28. Let 1 unite = 10 gms.

	Quantity				Carb. Qty	Carb. %	Total Cost
	P	Q	S	Total			
From 1st opt.	20 gm	10 gm	30 gm	60 gm	30.5 gm	<60%	
From IInd opt.	40 gm	10 gm	20 gm	70 gm	42 gm	60%	Rs.600
From IIIrd opt.	20 gm	10 gm	40 gm	70 gm	35 gm	50%	
From IVth opt.	30 gm	10 gm	20 gm	60 gm	34 gm	< 60%	
From Vth opt.	40 gm	10 gm	10 gm	60 gm	37.5 gm	>More than 60%	Rs.500

$\therefore$ The lowest cost per unit will be lowest for 4 : 1 : 1. **Ans. 4:1:1**

29. As we want at least 30% carbohydrate and protein no more than 25% fat and at least 5% minerals.

∴ Take 10 gm of each in equal quantities.

Option (1) O = P = 10 gm.

Protein will only be 5 gm. ∴ 25% , (not satisfying the condition.)

Option (2) Carbohydrates is only 5 gm. ∴ Only 25% , (not satisfying the condition.)

Option (3) Minerals will be 0.5 gm. ∴ Only 2.5% (not satisfying the condition.)

Option (4) Carbohydrates will be 5.5 gm. ∴ 27.5% (not satisfying the condition.)

To verify option (5),

O = S = 10 gm.

Carbohydrate = 9.5 gm. ∴ 47.5%

Protein = 8 gm. ∴ 40%

Fat = 1 gm. ∴ 5%

Minerals = 1.5 gm. ∴ 7.5%

So, **Ans. O and S**

30. From statement A = 60% of the top academic performers were not athletes.

⇒ 40% of them were athletes

From the question 10 top performers were athlete.

So 40% of top performers = 10.

Total number of top performers = 25.

Statement A is sufficient while statement B is not sufficient. **Ans. Only statement A is sufficient.**

31. Given conditions are

D   B

E   C

If we assign ranks as 1, 2, 3, 4, 5 median = 3. Then C's rank can be 4 or 5.

Statement (A) : Atul → 5 ⇒ C → 4

Rank	1	2	3	4	5
Name	D	E	B	C	A
	B	D	E	C	A

Hence we are not getting a unique answer.

Statement (B) alone is also not sufficient.

Combine (A) and (B) , we get the order as

Rank	1	2	3	4	5
Name	D	E	B	C	A.

Ans. Question can be answered only by taken both the statements together.

32. Let total employees are 100

Male 30   Female 70

eng.   Non eng.   eng.   Non eng.
x   y   7   63
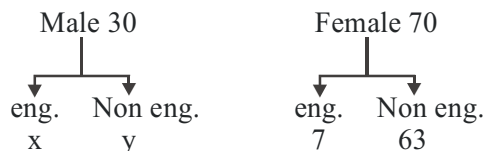
(A) Total eng. background = 25

⇒ x + 7 = 25

⇒ x = 18. Hence A alone is sufficient.

(B) $x = \dfrac{6}{5} \times 7$

$\Rightarrow x = \dfrac{42}{5}\%$. **Ans. Question can be answered either of the statements alone.**

33. M & M   Opponent

    a – 3   a $\Rightarrow$ first half

    From A statement

    M & M   Opponent

    a – 3 + 4 $\Rightarrow$ second half

    a + 1   ?

    From B statement

    M & M   Opponent

    Total = ?   Total = 4

    Combining the two, we get

    Opponent scored a max of 4 goals

	M & M	Opp
$\therefore$ Initial condition $\Rightarrow$	0	3
or	1	4
After second half $\Rightarrow$	4	4
or	5	4

    $\therefore$ There are 2 conditions possible.

    In one M and M ties the match and in second it wins.

    Ans. Questions cannot be answered.

34. According to the condition given in the question, we can find the cost for the various categories for 2007 when 1400 units are sold.

Material	70,000
Labour	28,000
Consumables	1300 (approx)
Rent of building	1200
Rates and taxes	400
Repair and main. exp.	820 (approx)
Operating cost of max.	42000
Selling and mar. exp.	5750
Total cost	1,49,470

    Cost per unitq $\dfrac{149470}{1400} = 106.74 \approx 107$. **Ans. 107**

35. Go by options: option (1) 313.

Total sell in Rs. = 313 × 125 = 39125.

Now we will calculate the cost for the various categories for 2007 when 313 units are sold.

Material	15650
Labour	6260
Consumables	1300
Rent of building	1200
Rates and taxes	400
Repair and main. exp.	800
Operating cost of max.	9390
Selling and mar. exp.	5750
Total cost	**40750**

Total cost is more than total sell (in Rs.). Hence there is a loss.

Now if we check for 384 units, we get total sell = 48000 and the total cost 47850.

Hence profit = 150. So minimum number of units = 384. **Ans. 384**

36. New price = $\dfrac{95}{100} \times 125 = 118.75$.

Now we can calculate the profit for the no. of units given in the option.

(e.g. at 1400 units, total sell = 1,66,250 and total cost = 1,49,470.

∴ Profit = 16,780)

We observe that as the number of units increases, profit increases.

Hence profit will be max. = 2000 units. **Ans 2000**

37. Profit will be maximum for 1400 units.

Total sale = 1400 × 125 = 1,75,000.

Total cost if number of units is 1400 is

Material	70000
Labour	28000
Consumables	1300
Rent of building	1200
Rates and taxes	400
Repair and main. exp.	800
Operating cost of max.	42000
Selling and mar. exp.	5750
Total cost	**1,49,450**

Profit = 1,75,000 – 1,49,450 = 25550 ≈ 25,400. **Ans. 25,400**

38. From the information given, we can dram the table as

	Male	Vegetarian	Female	Total
12th	48	32	32	80
11th	44	40	36	80
Secondary	288	352		640
Total	380	424		800

For secondary section the required percentage = $\dfrac{\text{Male students}}{\text{Total Students}} = \dfrac{288}{640} \times 100 = 45\%$. **Ans 45.**

39. From the information given, we can dram the table as

	Male	Vegetarian	Female	Total
12th	48	32	32	80
11th	44	40	36	80
Secondary	288	352		640
Total	380	424		800

In class 12, male vegetarian $= \dfrac{25}{100} \times 32 = 8$.

∴ Female vegetarian $= 32 - 8 = 24$.

Male nonvegetarian $= 48 - 8 = 40$.

The required difference is $40 - 24 = 16$. **Ans. 16**

40. From the information given, we can dram the table as

	Male	Vegetarian	Female	Total
12th	48	32	32	80
11th	44	40	36	80
Secondary	288	352		640
Total	380	424		800

The required percentage $= \dfrac{32}{80} \times 100 = 40\%$. **Ans. 40**

41. There is problem in this question.

42. From Table 1 and Table 2. We have:

For	India
Angioplasty	11000
Hip Replacement	9000
Knee Replacement	8500
Total	**28500**
Angioplasty	5000
Hip Replacement	7000
Knee Replacement	9000
Total	**21000**
Grand Total	**49500**

For	Thai
Angioplasty	13000
Hip Replacement	12000
Knee Replacement	10000
Total	**35000**
Total	**16000**
Grand Total	**51000**

For	Malaysia
Angioplasty	11000
Hip Replacement	10000
Knee Replacement	8000
Total	**29000**
Total	**18000**
Grand Total	**47000**

For	Singapore
Angioplasty	13000
Hip Replacement	12000
Knee Replacement	13000
Total	38000
Total	13000
Grand Total	**51000**

So it is least for Malaysia. **Ans. Malaysia**

43. India $\qquad$ $8500 + 9000 = 17500$

Thailand $\qquad$ $10000 + 6000 = 16000$

Malaysia $\qquad$ $8000 + 4000 = 12000$

Singapore $\qquad$ $13000 + 4000 = 17000$

So most expensive is India. **Ans. India**

44. Cost of treatment in Thailand = $ 4500 + $ 6000 = $ 10500

$\qquad = 10500 \times 32.89 = 34534.5$ Bahts.

Cost of treatment in India = $ 3000 + $ 5000 = $ 8000

$\qquad = 8000 \times 32.89 = 263120$ Bahts

Cost including travel expenses $= 263120 + (2 \times 7500) = 278120$ Bahts.

Difference $= 345345 - 278120 = 67225 \approx 67500$. **Ans. 67500**

45. New cost for spinal fusion in India $= \dfrac{5500 \times 40.928}{35} = 6431.54 (\text{dollar})$

Cost for spinal fusion in Singapore = 9000 (dollars)

The required difference = 2568.45 which is nearly equal to 2500. **Ans. 2500**

46. Possible routes from A to J to get shortest distance.

	Distance (kms)	Cost (Rs.)
ABJ	2860	2945
ADJ	2500	3700
AFJ	2300	2850
AGJ	2180	3340
AHJ	2350	2275
ACFJ	2170	2930

Other possible routes for two intermediate stations can be ABIJ, AFIJ, AGIJ, AHIJ but these routes will give higher distance.

$\therefore$ Shortest route is ACFJ. $\therefore$ Cost = Rs. 2930. **Ans. 2930**

47. From the table in previous question we can see that, lowest cost = Rs. 2275 for AHJ.

$\therefore$ Price of flight = 95% of 2275 $\approx$ 2161. **Ans. 2161**

48. If ADJ and AHJ are closed then lowest cost will be Rs. 2850 for AFJ. **Ans. 2850**

49. Number of routs from A to J are ABJ, AOJ, AFJ, AGJ and AHJ and minimum price per kilometre is for route AHJ.

Distance = 1950 + 400 = 2350 km.

Price = Rs. 2275

Margin = 10% over the total cost

∴ Cost per Km. = $\dfrac{2275}{1.1 \times 2350}$ =.88 **Ans. 0.88**

50. According to the options we can prepare the following table.

Routes	Distance (Km)	Price (Rs.)	Cost	Cost per Km
AFJ	2315	2850	2478.2	1.07
AGJ	2180	3340	2904.3	1.33
AHJ	2350	2275	1978.2	0.84
ACFJ	2170	2390	2078	0.95

Fifth option can be eliminated. Since the distance is not possible for any route.

From the above table answer is 2350 km. **Ans. 2350**

51. The author has stated throughout the passage what defines behaviour in society and has also given a direct clue in the 2nd paragraph. The rest of the options are negated in the passage. **Answer is Reciprocal roles determine normative human behaviour in society.**

52. As clearly stated in the para mentioning roles, the opposite of how we would react if a father acted in a such a manner. **Answer is We would not have been offended by the father playing his role 'tongue in cheek'.**

53. The complete tone of the passage is about the same phrase, according to which the "self" of a person gets so mixed or aligned with the occupation that the occupation becomes the "self". The examples of clergy man/ bus driver represent the same idea and hence the right **answer is : B only**

54. A is incorrect because "returned to" is wrong. We can simply say returned home. B is the case of redundancy. On and about used together is incorrect. Then, "The same" should be there instead of "that same". D is wrong; we need a comma after 'a Shaliach'. **Answer is E only.**

55. A seems to be correct but since the answer options do not include A in them, we are forced to choose the only appropriate one, i.e B only. C is incorrect, hyphen is not required. Instead, Semi-colon should be used. D is incorrect, because hyphen is not required and can be rewritten as how to go by a temporary stimulus. In statement E, we need to use effect (a change which is a result or consequence of an action or other cause) and not Affect (have an effect on; make a difference to). **Answer is B only.**

56. In statement A the word "democratic" should be precided by an article "the" .In statement C the phrase "...have been handed..." should be replaced by "...have been handed over...". In statement E is explicitly incorrect. **Answer is B & D.**

57. The paragraph in the last line is trying to generate an idea of personification. From the last 3 lines of the paragraph we can understand, that its tough to give macro level stories from the perspective of the macro level participants. So its textual device we use to make it more comprehensible **Answer is The difference between 'life' and 'interpretation of life'.**

58. The answer is in the last paragraph, where the poet uses the term "other creations" and in the third line it's given that: There is no sign of the destination. And then some example follow it explaining the same. So the right answer is **Define the place of the poet in his culture.**

59. In the second paragraph the line between "Such a period……. genius of the age". Give the answer to the question. **The answer is: Poets and artists of Renaissance.**

60. The paragraph in the last line is trying to generate an idea of personification. From the last 3 lines of the paragraph we can understand, that its tough to give macro level stories from the perspective of the macro level participants. So its textual device we use to make it more comprehensible.
Answer is The personification of a whole organization is a textual device we use to make macro-level theories more comprehensible.

http://books.google.com/books?id=zazOchpSJ_gC&pg=PA98&lpg=PA98&dq=the+squatters+land+was+more+intensely+alive+than+the+rest+of+the+farm+and+was+changing+with+the+seasons+the+year+round&source=web&ots=QllOCheO96&sig=B-ntIwNYY9cyKpjoMczdjNtluOQ#PPA98,M1

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.

61. http://www.thenewatlantis.com/archive/10/rosen.htm
Answer is Yet, despite these technical developments, photographs still remain powerful because they are reminders of the people and things we care about.

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.

62. http://www.amazon.co.uk/gp/reader/034911675X/ref=sib_fs_top/203-6565312-3963140?ie=UTF8&p=S009&checkSum=Iuah%2B7H%2F1myv2wCcyYCSQPycqkdMA64J6Uvy67PuCIE%3D#reader-link. No inventory would ever include those, of course, as per the source.

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.

63. Option (1). The passage traces the relationship between rules, paradigms and normal sciences in the three paragraphs given. Although option (3) might look to be close but since the author does end with normal science with regards to paradigms, we can safely take option (1) as our answer. **Answer is Relationships between rules, paradigms, and normal science.**

Link:faculty.washington.edu/lynnhank/Kuhn2.pdf

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.

64. As evident from the 1st paragraph, the author states in the last line that'…mature scientific community…" **Answer is Loyalty to a certain paradigm of scientific inquiry.**

Link:faculty.washington.edu/lynnhank/Kuhn2.pdf

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.

65. Option (1) can be disregarded as paradigms help in defining a scientific tradition and themselves do not define them. Option (2) can be eliminated as rules existing has been negated by the author in the last paragraph. Option (3) is also negated in the last paragraph. Option (4)doesn't connect to the passage at all. Option (5) can be inferred from the 3rd last line of the passage. **Answer is Paradigms are a general representation of rules and beliefs of a scientific tradition.**

Link:faculty.washington.edu/lynnhank/Kuhn2.pdf

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.

66. The correct usage of the sentences has both a grammatical component and a word usage component as well. The cricket council will take singular so we will choose was and continue the same with the helping verb is. The critics will censure as it means criticize and not censor which means cut or delete. Amit's explanation was credible which means believable or plausible and not credulous which means gullible. She coughed discreetly which means doing something in a careful or circumspect manner and not discrete which means individually distinct and separate. **Answer is AABBA.**

67. The further meaning extent or degree and not farther meaning distance he pushed himself….For the crowds it was more of a historic (important, significant) event and not historical (documented, ancient). The old man has a healthy distrust (regard with suspicion) for all new technology and not mistrust (lack of trust, mistrust also takes a 'of' and not for). The film is based on a true (in accordance to fact or reality) and not real (actual, existent). One suspects that the compliment (flattering remark, praise) and not complement (accessory, supplement) was backhanded. **Answer is ABABA.**

68. Regretfully (in a regretful manner) I have to decline your invitation and not regrettably (giving rise to regret, undesirable). Iam drawn to the poetic, sensuous (aesthetic, lush) quality of her paintings and not sensual (physical, passionate). He was beside himself (beside oneself means overcome with) with rage and not besides (in addition to, apart). After brushing against a stationary (not moving) truck.. and not stationery(writing wares). As the water began to rise above (extending upwards towards) the danger mark.. and not over(extending directly upwards from). **Answer is BBBAB.**

69. Islands with considerable degree of isolation provide valuable insights as a society has develop despite of all geographical disadvantages option no. 4 depicts the same idea that "...differing in their... Australia" although it has used the name of five continents which is not mentioned in the paragraph but the number is mentioned. **Answer is Isolated islands, differing in their endowments and size, provide a good comparison to large islands such as Eurasia, Africa, Americas and Australia.**

Link:http://www3.interscience.wiley.com/cgi-bin/abstract/56580/ABSTRACT?CRETRY=1&SRETRY=0

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.

70. The answer is explicitly given in 3rd, 4th & 5th line of the first paragraph.
Answer is Historical sciences suffer from the inability to conduct controlled experiments and therefore have explanations based on a few long-term factors.

Link:http://www3.interscience.wiley.com/cgi-bin/abstract/56580/ABSTRACT?CRETRY=1&SRETRY=0

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.

71. Options (1) and (3) can be eliminated since the author has not stated anything regarding what the students of history are doing. He has only stated as to what can be effectively done. Option (4) is wrong because of the word 'unique' and option (5) is wrong because of the word 'confounding". Option (2) can be inferred from the first half of the last paragraph. **Answer is Complex societies inhabiting large islands provide great opportunities for natural experiments.**

Link:http://www3.interscience.wiley.com/cgi-bin/abstract/56580/ABSTRACT?CRETRY=1&SRETRY = 0

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.

72. CD is a clear connection. Statement A talks of highly educated women being in stronger position in the labour market and having higher rates of marriage. This is conveniently followed by E stating "Indeed, just as crime….economic approach to the evolution of family structures". This is followed by B stating "some works support…"CD is a link with "And, as with crime.." and But regardless of the conclusion.." **Answer is EBCD.**

73. A states "personal experience..." and this is ideally followed by E which states "In addition.." and then this is verified by D which states "the contrasting..." CB is a clue as C talk of contemporary and modern discourses and B continues with may exist in parallel to other equally dominant discourses. **Answer is EDBC.**

74. Statement A starts with Indonesia experiencing dramatic shifts after Soeharto.. The main clue in the question was use of Reformasi which is deduced to be a paper. So B has to come after C which talks of the mass media…Also DE is connected as D talks of the view points of donors and external analysts followed by E which talks of the scepticism of a different group of analysts. So with CB and DE, e get (2) as the option. **Answer is CBDE.**

Link: linkinghub.elsevier.com/retrieve/pii/S0305750X07000770

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.

75. AC and BED were clues. Since A talks about the author's land being occupied by Squatters and C continues by explaining who the squatters were. statement talks about maize being grown by the squatters and e continues with the cultivation of the maize and D ends with The Kikuyu also growing sweet potatoes and pumpkins. **Answer is CBED.**

http://books.google.com/books?id=zazOchpSJ_gC&pg=PA98&lpg=PA98&dq=the+squatters +land+was+more+intensely+alive+than+the+rest+of+the+ farm+and+was+changing+with+the+seasons +the+year+round&source=web&ots=QllOCheO96&sig=B-ntIwNYY9cyKpjoMczdjNtluOQ#PPA98,M1

Wherever link of the source for a particular question has been provided, kindly type the link in a new brouser window.