

**SECTION – I (Quant)**

**This section contains 25 questions**

1. Consider the set  $S = \{2, 3, 4, \dots, 2n + 1\}$ , 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

**Solution:**

Given  $S = \{2, 3, 4, \dots, 2n + 1\}$

$X$  = Average of the odd integers of  $S$

$$\therefore X = \text{Average of } 3, 5, 7, \dots, 2n + 1$$

Since 3, 5, 7, ... 2n + 1 are in Arithmetic series, average of the series = average of 3 and 2n + 1

$$\therefore X = \frac{3+(2n+1)}{2} = n + 2$$

Given;  $Y$  = Average of 2, 4, 6, ... 2n

Since 2, 4, 6, ... 2n are in Arithmetic series

$Y$  = average of 2 and 2n

$$\therefore Y = n + 1$$

$$\text{Hence } X - Y = (n + 2) - (n + 1) = 1$$

Note: This question is independent of the value of  $n$ .  
Choice (2)

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

**Solution:**

Sum of the ages of the eight members ten years ago = 231 years.

After three years, their sum would be  $231 + 8$  (3) i.e. 255 years. But at this point one of the members aged 60 years died and a new born entered the family. So, the sum of the ages of the members of the family now = 255 - 60 i.e., 195 years.

After 3 more years, another 60 years old is replaced by a new born. So, the sum of the ages of all the eight members now =  $195 + 8$  (3) - 60 = 159 years. After four more years, i.e. at present the sum of their ages =  $159 + 8$  (4) i.e. 191 years.

$\therefore$  The average age at present is  $\frac{191}{8}$  i.e. 24 years  
Choice (5)

3. A function  $f(x)$  satisfied  $f(1) = 3600$ , and  $f(1) + f(2) + \dots + f(n) = n^2 f(n)$ , for all positive integers  $n > 1$ . What is the value of  $f(9)$ ?
- (1) 80      (2) 240      (3) 200  
 (4) 100      (5) 120

**Solution:**

Given that  $f(1) + f(2) + f(3) + \dots + f(n) = n^2 [f(n)]$

$$\Rightarrow f(1) + f(2) + f(3) + \dots + (n-1) f(n-1) = (n^2 - 1) [f(n)]$$

$$\Rightarrow (n-1)^2 f(n-1) = (n^2 - 1) [f(n)]$$

$$\Rightarrow f(n) = \frac{n-1}{n+1} [f(n-1)]$$

$$\therefore f(9) = \frac{8}{10} \times \frac{7}{9} \times \frac{6}{8} \times \frac{5}{7} \times \frac{4}{6} \times \frac{3}{5} \times \frac{2}{4} \times \frac{1}{3} \times f(1)$$

$$= \frac{2 \times 1}{10 \times 9} \times f(1) = \frac{3600}{45} = 80 \quad \text{Choice (1)}$$

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

**Solution:**

Let the number of 1 Miso, 10 Misos and 50 Misos used to pay the bill of 107 Misos be  $x$ ,  $y$  and  $z$  respectively.

$$\therefore x + 10y + 50z = 107 \quad \text{(i)}$$

Clearly  $z$  can take values 0, 1 and 2 only.

Case 1 :  $z = 0$

(i) becomes  $x + 10y = 107$

$$\Rightarrow y = \frac{107-x}{10}$$

$\therefore$  Minimum value of  $y$  is 0 and maximum value of  $y$  is 10

$\therefore$  There are 11 possibilities when  $z = 0$

Case 2:  $z = 1$

(i) becomes  $x + 10y = 57$

$$y = \frac{57-x}{10}$$

$\therefore$  Minimum value of  $y$  is 0 and maximum value of  $y$  is 5

$\therefore$  There are 6 possibilities when  $z = 1$ .

Case 3:  $z = 2$

(i) becomes  $x + 10y = 7$

Clearly  $x = 7$  and  $y = 0$  is the only solution when  $z = 2$

Hence total number of ways in which 107 Misos can be paid is  $11 + 6 + 1 = 18$  ways.

Choice (3)

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

**Solution:**

Let the amount on the cheque be Rs. $x$  and  $y$  paise.  
 Value of the amount with him initially =  $(100y + x)$  paise  
 Value of the amount with him after buying a toffee  
 $= (100y + x - 50)$  paise  
 Given that  $100y + x - 50 = 3(100x + y)$   
 $\Rightarrow 97y - 299x = 50$   
 $\Rightarrow 97(y - 3x) = 8x + 50$   
 To satisfy the equation above,  $8x + 50$  must be divisible by 97 and also it is even. Hence the least possible value of  $8x + 50 = 97(2) = 194$   
 In this case  $x = 18$   
 $\therefore$  Choice (4) is a valid statement.      Choice (4)

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

**Solution:**

$\frac{1}{m} + \frac{4}{n} = \frac{1}{12}$   
 $\Rightarrow 12n + 48m = mn$   
 $\Rightarrow m(n - 48) - 12(n - 48) = (12)(48)$   
 $\Rightarrow (m - 12)(n - 48) = 2^6 \times 3^2$   
 Given that  $n$  is odd and less than 60.  
 Hence,  $n - 48$  is odd and less than 12.  
 $\therefore n - 48 = 1$  or  $3$  or  $3^2$   
 $\therefore (m, n)$  has three possibilities.      Choice (5)

**Directions for Questions 7 to 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:  $W_{II} - W_I = 10$   
 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 weight 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.

**Solutions for questions 7 to 10:**

7. The average weights of the two sections and the number of students in the two sections are shown below.

Section	I	II
Av. Wt	$W_1 = 45 - x$	$W_2 = 45 + x$
No	50	50

[The total deviation from 45 has to be 0]

After the two changes, Deepak moving to section I, and Poonam to section II, the averages get switched, as shown below.

Section	I	II
Av. Wt	$45 + x$	$45 - x$
No	49, Deepak	49, Poonam

In section I, Poonam is replaced by Deepak and the av.wt increases by  $2x$ , i.e., the total weight changes from 50 ( $45 - x$ ) to 50 ( $45 + x$ )

$\therefore D$ 's weight ( $d$ ) exceeds  $P$ 's weight ( $p$ ) by  $100x$  i.e.,  $d - p = 100x \dots (1)$

From (A),  $x = 0.5$ , i.e.,  $d - p = 50$

But we can't get  $p$ .

From (B) alone, the averages are as shown below.

Section	I	II
Av. Wt	45	45
No	50 Deepak	49

Initially, the total weight of section I is  $50(45 - x)$

After D joins, it is  $51(45) = 50(45) + 45$

$\therefore d = 45 + 50x$

We can say (from (1)) that  $p = 50x - 5$  but we don't know  $x$ .

By combining A, B we can conclude that  $p = 50(0.5) - 5 = 20$ .      Choice (3)

8. The outer radius  $R = 5$  m

From (A), the inner radius  $r > 4$  m

$$\text{The capacity } (V) = \frac{4}{3}\pi r^3$$

$$\text{If } r = 4 \text{ m, } V \approx \frac{4}{3} \left( \frac{22}{7} \right) (64) \text{ m}^3$$

$$= 256 \left( \frac{22}{21} \right) \text{ m}^3 \approx 268 \text{ m}^3$$

$$\text{If } r = 5 \text{ m, } V \approx \frac{4}{3} \left( \frac{22}{7} \right) (125) \text{ m}^3$$

$$= \left( \frac{22}{21} \right) (500) \text{ m}^3 \approx 524 \text{ m}^3$$

So we can't say whether  $V \geq 400 \text{ m}^3$  or not.

From (B), the volume of the material of the tank

$$= \frac{3(10^3)}{3} \text{ cm}^3 = 10 \text{ m}^3$$

The total volume occupied by the tank is known to be  $524 \text{ m}^3$ .

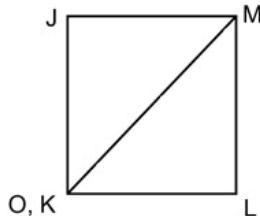
$\therefore$  The tank capacity is  $514 \text{ m}^3$  which is adequate.

Choice (2)

9. From (A), the minimum value of  $x^2 + y^2 + z^2$  is attained when  $x, y, z$  are as close to each other as possible, i.e. two of them are 30 and the third is 29. Hence, the minimum value of  $x^2 + y^2 + z^2 = 30^2 + 30^2 + 29^2 = 2641$ . B alone is not a sufficient criterion to arrive at a unique answer.

Choice (1)

10.



Given a segment JK and JM is perpendicular to JK. From (A), there is a point O on JK such that  $OM = 2OL$

If we suppose that it is possible for Rahim to draw a square JKLM, the perpendicular distance of M from JK should be equal to JK

Let P be the midpoint of JK and O be a variable point on JK.

If  $O = P$ ,  $OM = OL$  and  $OM/OL = 1$ . As O moves down towards K,  $OM/OL$  increases.

When  $O = K$ ,  $OM/OL$  would be  $\sqrt{2}$

If O moves up towards J  $OM/OL$  decreases.

$$\text{When } O = J, OM/OL = \frac{1}{\sqrt{2}}$$

$$\text{Hence } \frac{1}{\sqrt{2}} \leq \frac{OM}{OL} \leq \sqrt{2}$$

$\therefore OM$  cannot be 2 times of  $OL$ .

Hence from (A), we can find why Rahim is unable to draw the intended square.

Choice (1)

#### 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

#### Solutions for questions 11 and 12:

Let T hr be the time gap and V kmph be the plane cruising speed.

$$\therefore \frac{3000}{V - 50} + t = 7 \rightarrow (1) [\text{when travelling from B to A}]$$

$$\frac{3000}{V + 50} - t = 4 \rightarrow (2) [\text{when travelling from A to B}]$$

$$(1) + (2) \Rightarrow \frac{3000}{V - 50} + \frac{3000}{V + 50} = 11$$

$$\Rightarrow 3000(2V) = 11(V^2 - 2500)$$

$$\Rightarrow 11V^2 - 6000V - 27500 = 0$$

$$\Rightarrow 11V^2 - 6050V + 50V - 27500 = 0$$

$$\Rightarrow 11(V - 550) + 50(V - 550) = 0$$

$$\Rightarrow V = 550 \text{ or } \frac{-50}{11}$$

As V is positive  $V = 550$

$$\therefore t = 7 - \frac{3000}{500} = 1$$

11.  $t = 1$  hour.

Choice (4)

12.  $v = 550$

Choice (2)

#### 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

### Solutions for questions 13 and 14:

Let Rs.x, Rs.y and Rs.z be the amount invested in option A, option B and option C respectively.

Here, in order to calculate the return of the investment we have to consider two cases namely a rise in the market and a fall in the market. If there is a rise in the market, the return of investment is 0.1% of (x) + 5% of (y) - 25% of (z) ——— (1)

If there is a fall in the market the return of investment is 0.1% of (x) - 3% of (y) + 2% of (z) ——— (2)

Let 'R' be the guaranteed return of investment. Clearly R is the minimum of the expressions (1) and (2).

13. Now 'R' will be maximum when (1) = (2)  
 i.e.,  $0.1x + 5y - 25\% z = 0.1\% x - 3\% y + 2\% z$   
 $\Rightarrow 8\% y = 4.5\% z$   
 $\Rightarrow 16y = 9z \Rightarrow 16y = 9z$   
 $\therefore \frac{y}{z} = \frac{9}{16}$  ——— (3)

Let us take the entire amount to be Rs.100

Cleary if the entire amount is put in option A the return of investment is 0.1%. alternatively if the entire amount is put in option B and option C the maximum return of investment is obtained by investing Rs.36 in option B and Rs.64 in option C (from (3))

$\therefore$  In this case

$$R = 5\% (36) - 2.5\% (64) \text{ [from (1)]}$$

$$\text{i.e., } R = 0.2$$

$\therefore$  In this case return of investment is 0.2%

Hence if the entire amount is invested in option A we get  $R = 0.1\%$  and if the entire amount is invested in option B we get  $R = 0.2\%$

$\therefore$  Maximum guaranteed return is 20%, since any combination of option A, B and C will give a return of investment between 0.1% and 0.2%. Choice (3)

14. Clearly from the previous question it is clear that we get maximum return of investment when the entire investment is made in option B and option C.  
 Also the investments in option B and option C are in the ratio 9 : 16  
 $\therefore$  36% in option B and 64% in option C will maximize the guaranteed return. Choice (2)

### Directions for Question 15 and 16:

Let S be the set of all pairs  $(i, j)$  where  $1 \leq i < j \leq n$  and  $n \geq 4$ . 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 S have?

- |                                  |                                 |
|----------------------------------|---------------------------------|
| (1) $n-3$                        | (2) $\frac{1}{2}(n^2 - 3n - 2)$ |
| (3) $2n - 7$                     | (4) $\frac{1}{2}(n^2 - 5n + 6)$ |
| (5) $\frac{1}{2}(n^2 - 7n + 14)$ |                                 |

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) $\frac{1}{2}(n^2 - 5n + 8)$  | (2) $2n - 6$ |
| (3) $\frac{1}{2}n(n-3)$          | (4) $n - 2$  |
| (5) $\frac{1}{2}(n^2 - 7n + 16)$ |              |

### Solutions for questions 15 and 16:

15. From the definition of S clearly, the number of elements of S is  $nC_2$ .

Let us consider a member  $(i, j)$  of S. Now the enemies of  $(i, j)$  will be the pairs which do not contain i and j hence excluding i and j from the remaining  $(n - 2)$  numbers we get  $(n - 2)C_2$  pairs.

$\therefore$  The number of enemies for each member of S is  $(n - 2)C_2$  i.e.  $\frac{(n-2)(n-3)}{2} = \frac{1}{2}[n^2 - 5n + 6]$

Choice (4)

16. Let us consider the common friends of  $(i, j)$  and  $(j, k)$ . Clearly  $(i, k)$  is a common friend to both  $(i, j)$  and  $(j, k)$ . Also all the pairs which contain 'j' as one of the element will be common friends to both  $(i, j)$  and  $(j, k)$ . There will be  $(n - 1)$  pairs that contain 'j' as one of the element out of which  $(i, j)$  and  $(j, k)$  are also members. So excluding them we will have  $(n - 3)$  pairs containing 'j' as an element.

$\therefore$  Total number of common friends number of common friends in  $(n - 3) + 1 = n - 2$

Choice (4)

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

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

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) $k(n - 2)$ | (5) $(n - 1)(k - 1)$ |                |

### Solution:

Since there are  $n$  teams with  $k$  players in each team the total number of players will be  $n \times k$  provided there are no common players. But it is given that there is exactly one common player in the teams  $(T_1, T_2), (T_2, T_3), \dots, (T_n, T_1)$

Hence the total number of common players is  $n$ .

$\therefore$  Total number of players is  $nk - n = n(k - 1)$

Choice (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 prefect squares?

- |       |       |       |
|-------|-------|-------|
| (1) 3 | (2) 2 | (3) 4 |
| (4) 0 | (5) 1 |       |

**Solution:**

Let the number 'N' be denoted by aabb

$$N = aabb$$

$$N = 1000a + 100a + 10b + b$$

$$N = 11[100a + b]$$

$\therefore$  'N' is a multiple of 11. Also it is given that 'N' is a perfect square. 'N' has to be an even multiple of 11 because if 'N' is an odd number and a perfect square, the unit's digit will be odd and ten's digit will be even.

$\therefore$  N is an even multiple of 11 and also a perfect square. Hence N is a multiple of  $22^2$ .

$\therefore$  The possible values of N are  $22^2, 44^2, 66^2$  and  $88^2$ . But of them  $88^2 = 7744$  is the only number that is of the form aabb.

Choice (5)

**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  $66 \frac{2}{3} \%$ . 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

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

**Solutions for questions 19 and 20:**

19. The production cost for 20 units is  $400c + 20b + 240$  ---- (1)

The production cost for 40 units is  $1600c + 40b + 240$  ---- (2)

The production cost for 60 units is  $3600c + 60b + 240$  ---- (3)

$$\text{Given that, } 1600c + 40b + 240 = \frac{5}{3}(400c + 20b + 240)$$

$$280c + 2b = 48 \text{ ---- (4)}$$

Also given that

$$3600c + 60b + 240 = \frac{3}{2}(1600c + 40b + 240)$$

$$\therefore c = \frac{1}{10}$$

$$\text{From (4) and } c = \frac{1}{10}, \text{ we have } b = 10.$$

Now if 'x' units are produced the profit of Mr. David is given by

$$30x - (cx^2 + bx + 240) = 30x - \left(\frac{1}{10}x^2 + 10x + 240\right) = \frac{1}{10}[-x^2 + 200x - 2400]$$

For this to be maximum,  $-x^2 + 200x - 2400$  must be maximum and the maximum value of the quadratic expression is obtained at  $x = -\frac{b}{2a} = -\frac{200}{2(-1)} = 100$ .

$\therefore$  Mr. David should produce 100 units to maximize the profit.

**Note:** The maximum value of the quadratic expression  $ax^2 + bx + c$  ( $a < 0$ ) is obtained when  $x = -b/2a$

Choice (2)

$$\begin{aligned} 20. \text{ Maximum profit} &= \frac{1}{10}[-(100)^2 + 20(100) - 2400] \\ &= \frac{1}{10}[-10,000 + 20,000 - 2400] = \frac{1}{10}[7600] \\ &= 760 \end{aligned}$$

Choice (4)

21. The price of Darjeeling tea (in rupees per kilogram) is  $100 + 0.10n$ , on the  $n^{\text{th}}$  day of 2007 ( $n = 1, 2, \dots, 100$ ), and then remains constant. On the other hand, the price of Ooty tea (in rupees per kilogram) is  $89 + 0.15n$ , on the  $n^{\text{th}}$  day of 2007 ( $n = 1, 2, \dots, 365$ ). 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

**Solution:**

$$\text{If } n = 100,$$

$$100 + 0.10n = 110.$$

$$\text{And } 89 + 0.15n = 104.$$

$\therefore$  For  $n \leq 100$ , the prices of these two varieties of tea will not be equal.

From the  $100^{\text{th}}$  day onwards, the price of Darjeeling tea will be Rs.110 per kg

Now for  $89 + 0.15n$  to be equal to 110,

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

$\therefore$  On the  $140^{\text{th}}$  day of 2007, the required situation will arise i.e., on  $(31 + 28 + 31 + 30 + 20)^{\text{th}}$  day i.e., on May 20, 2007, the required situation will arise.

Choice (3)

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

**Solution:**

For  $\angle AQP$  to be minimum possible value, A and B must be as close as possible [i.e., they are nearly the same point], then the angle would be approximately zero.

For  $\angle AQP$  to be maximum possible value, each circle must pass through the centre of the other circle, in which case, the required angle is  $60^\circ$ .

Hence  $0^\circ < \angle AQP < 60^\circ$

Choice (3)

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

### Solution

Let  $f(x) = ax^2 + bx + c$

Given  $f(0) = 1$

$$\therefore c = 1$$

$$f(1) = a + b + c = 3$$

$$\therefore a + b = 2 \quad \text{--- (1)}$$

$$\text{As } f(x) \text{ is maximum at } x = 1, \frac{-b}{2a} = 1 \quad \text{--- (2)}$$

$$\text{Solving (1) and (2), } a = -2 \text{ and } b = 4$$

$$\therefore f(x) = -2x^2 + 4x + 1$$

$$\therefore f(10) = -159$$

Choice (2)

### Directions for Questions 24 and 25:

Let  $a_1 = p$  and  $b_1 = q$ , where  $p$  and  $q$  are positive quantities. Define  $a_n = pb_{n-1}$ ,  $b_n = qb_{n-1}$ , for even  $n > 1$ , and  $a_n = pa_{n-1}$ ,  $b_n = qa_{n-1}$ , 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  $p = \frac{1}{3}$  and  $q = \frac{2}{3}$ , 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

### Solutions for questions 24 and 25:

The sequences  $a_n$  and  $b_n$  are defined by different expressions for even and odd values of  $n$ . The definitions are recursive, ie., to evaluate the term for a certain value of  $n$ , we need the terms with lower values of  $n$ . For both  $a_n$  and  $b_n$ , the reference term is  $b_{n-1}$  (for even  $n$ ) and  $a_{n-1}$  (for odd  $n$ ).

$\therefore$  We will find it convenient to tabulate the values of  $a_n$  and  $b_n$  as shown below.

				$a_n + b_n$	
				for odd $n$	for even $n$
$a_1 = p$	$b_1 = q$			$p + q$	
$a_2 = pq$	$b_2 = q^2$				$q(p + q)$
$a_3 = pq$	$b_3 = pq^2$			$pq(p + q)$	
$a_4 = p^2q^2$	$b_4 = pq^3$				$pq^2(p + q)$
$a_5 = p^3q^2$	$b_5 = p^2q^3$			$p^2q^2(p + q)$	

24. We see that for even values of  $n$ ,  $a_n + b_n = q(pq)^{\frac{n-1}{2}} (p + q)$ .  
 Choice (1)

25.  $p = \frac{1}{3}$ ,  $q = \frac{2}{3}$  and  $n$  is odd

$$\therefore a_n + b_n = (pq)^{\frac{n-1}{2}} (p + q) = \left(\frac{2}{9}\right)^{\frac{n-1}{2}}$$

$$\text{We see that } a_7 + b_7 = \left(\frac{2}{9}\right)^{\frac{7-1}{2}} = \frac{8}{729} > \frac{8}{800} \\ = 0.01$$

$$\text{But } \left(\frac{2}{9}\right)^{\frac{9-1}{2}} = \frac{16}{6561} < \frac{16}{6400} = \frac{0.01}{4}$$

$\therefore$  The smallest odd value of  $n$  for which  $a_n + b_n < 0.01$  is 9.  
 Choice (4)

### SECTION – II (DI)

#### 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 and 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 %
O	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?

- (1) One      (2) Two      (3) Three  
 (4) Four      (5) None of these

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.

- (1) 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

**Solutions for questions 26 to 29:**

26. The mixture must contain 10% minerals. As there are only two ingredients (O and Q) with 10% minerals, the diet can be prepared in only one way. As O and Q have 30% protein each, they can be mixed to form the diet. Choice (1)

27. None of the choices among (1), (2) and (3) can be used to form the diet with 10% fat and at least 30% protein. For Q and S to form the diet with 10% fat and at least 30% protein, if they are mixed in the ratio  $x : y$  (say)

$$\frac{x(50) + y(0)}{x + y} = 10, \quad x : y = 1 : 4$$

$$\therefore \text{Cost per unit} = \frac{1(200) + 4(100)}{5} = \frac{600}{5} = 120$$

Similarly, the ratio for R and S is 1 : 3 and cost per unit is  $\frac{800}{4} = 200$ .

∴ The cost per unit is the least for Q and S.  
Choice (4)

28. The diet should have at least 60% carbohydrate. Further in the mixture formed by P, Q and S, the proportion of P should be the maximum and the other two should be minimum to get the lowest per unit cost.

Among the given options only choices (2) and (5) satisfy the condition of having 60% carbohydrate and of these choice (5) has the lower per unit cost.  
Choice (5)

29. O and P when mixed in equal proportions, the protein content will be only  $\frac{30+20}{2}$

$\rightarrow 25\%$ , which is less than required.

R and S when mixed in equal proportion, the carbohydrate content will be only  $\frac{5+45}{2} = 25\%$ ,

which is less than required.

Similarly P and S and Q and R when mixed in equal proportion the combination will have less than the required amount of minerals and carbohydrate respectively.

Only O and S when mixed in equal proportion would yield a mixture with all the contents in the required amounts.

### Choice (5)

**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.

### Solutions for questions 30 to 33:

30. From A, as 60% of the top academic performers were not athletes, the remaining 40% of the top academic performers were athletes. It is given that 10 athletes were among the top academic performers.

$$\therefore 40\% = 10$$

$\Rightarrow 100\% = 25$ .

Hence A alone is sufficient.

B gives no data, it is just an assumption.

### Choice (1)

31. From A and the given condition,  
Either Bala or Dev got the highest rank.  
Hence, A alone is not sufficient.  
From B and the given condition, either Dev or Atul  
can be the highest ranker.  
Hence, B alone is not sufficient.  
Combining A and B, Dev must get the highest rank.  
Choice (4)

32. It is given that,  
30% of the employees are males, which implies  
70% of the employees are females. Also 10% of the  
female employees have an engineering background.  
 $\Rightarrow 10\% (70\%) \Rightarrow 7\%$  of the employees are females  
with engineering background.  
From A,  
25% of the employees have engineering  
background.  
Hence  $25 - 7 = 18\%$  of the employees are males  
with engineering background.  
So, A alone is sufficient.

From B,  
Number of male employees having an engineering  
background = 120% of female employees with  
engineering background.  
As 7% of employees are females with engineering  
background,  $120\% (7\%) \Rightarrow 8.4\%$  of the employees  
are males from engineering background. So B alone  
is also sufficient.  
Choice (3)

33. Clearly A alone is not sufficient, as we do not know  
how many goals did the opponent score.  
B alone is also not sufficient, as we do not know  
how many goals did Mahindra and Mahindra club  
score. Combining A and B,  
If the score at the half-time is 0 – 3, then the match  
would have ended in a 4 – 4 draw. So, Mahindra  
and Mahindra club cannot win. If the score at the  
half-time is 1 – 4, then at the end it is 5 – 4. So,  
Mahindra and Mahindra club can win. So, we cannot  
answer even after combining both the statements.  
Choice (5)

**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
<b>Costs (Rs.)</b>					
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

#### Solutions for questions 34 to 37:

If one observes the values given for the different parameters, the values that were varying with production i.e. value was increasing when production increased and value decreasing when production decreased are Material, Labour and Operating cost of machines.

All the remaining costs i.e., Rent of building, Consumables, Rates and taxes, Repair and maintenance expense and selling and marketing expenses are fixed. Hence there will be no change in these costs. The total fixed cost =  $1200 + 400 + 800 + 5800 + 1400 = 9600$ .

Now the cost/unit for different variable costs is as follows.

Material = Rs.50 per unit

Labour = Rs.20 per unit

Operating cost of machines = Rs.30 per unit

Total = Rs.100 per unit

Selling price per unit = Rs.125



**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.

Comparative Costs in USA and some Asian countries (in US Dollars)					
Procedure	USA	India	Thailand	Singapore	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:

Comparative Costs in USA and some Asian countries (in US Dollars'000)					
Procedure	USA	India	Thailand	Singapore	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

#### Solutions for questions 42 to 45:

The cost for angioplasty, hip replacement and knee replacement in the different countries are  
 (in thousand dollars)

	India	Thailand	Malaysia	Singapore	USA
Angioplasty	11 + 5	13 + 5	11 + 6	13 + 4	57
Hip replacement	9 + 7	12 + 5	10 + 8	12 + 5	43
Knee replacement	8.5 + 9	10 + 6	8 + 4	13 + 4	40
Total	49.5	51	47	51	140

- 42.** The cheapest is in Malaysia      Choice (3)
- 43.** As given in the previous question, the total cost will be highest in India ( $8,500 + 9,000 = 17,500$ )  
 Choice (1)

44. Cost in India =  $3000 + 5000 = 8000$   
 Cost in Thailand =  $4500 + 6000 = 10500$   
 Difference =  $2,500 \times 32.89 = 82225$   
 Cost of travel = 15,000  
 ∴ Required difference =  $67,225 \approx 67500$   
 Choice (4)

45. Cost in India with dollar at 40.92 =  $5500 \times 40.92 = 2,25,000$   
 Cost in India with dollar at 35 =  $\frac{2,25,000}{35} \approx 6500$  dollars  
 Cost in Singapore = 9000  
 Required difference = 2500  
 Choice (2)

**Directions for Questions 46 to 50:** Answer the following questions based on the information given below:

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	870
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

in rupees, to be paid by a passenger travelling from A to J?

(1) 2275      (2) 2615      (3) 2850  
 (4) 2945      (5) 3190

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

49. If the prices include a margin of 10% over the total cost that the company incurs, what is the minimum cost per kilometre 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

48. If the airports C, D and H are closed down owing to security reasons, what would be the minimum price,

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 and J that minimizes the total cost per kilometer for the company?

(1) 2170      (2) 2180      (3) 2315  
 (4) 2350      (5) 2390

### Solutions for questions 46 to 50:

Let us check the possible shorter routes from A to J

	Total Cost	Total distance
A $\frac{\text{Rs.670}}{560 \text{ km}}$ B $\frac{\text{Rs.2275}}{2300 \text{ km}}$ J	Rs.2945	2860 km
A $\frac{\text{Rs.1250}}{850 \text{ km}}$ D $\frac{\text{Rs.2450}}{1650 \text{ km}}$ J	Rs.3700	2500 km
A $\frac{\text{Rs.1700}}{1345 \text{ km}}$ F $\frac{\text{Rs.1150}}{970 \text{ km}}$ J	Rs.2850	2315 km
A $\frac{\text{Rs.2450}}{1350 \text{ km}}$ G $\frac{\text{Rs.890}}{830 \text{ km}}$ J	Rs.3340	2180 km
A $\frac{\text{Rs.1850}}{1950 \text{ km}}$ H $\frac{\text{Rs.425}}{400 \text{ km}}$ J	Rs.2275	2350 km
A $\frac{\text{Rs.1350}}{790 \text{ km}}$ C $\frac{\text{Rs.430}}{410 \text{ km}}$ F $\frac{\text{Rs.1150}}{970 \text{ km}}$ J	Rs.2930	2170 km

46. The shortest possible route is A – C – F – J. The cost is Rs.2930  
Choice (4)

47. The route with least cost is A – B – J, with a total cost of Rs.2275. As the cost of the new flight is 5% less than Rs.2275, it should be  
 $= 2275 - (5\% \text{ of } 2275) = 2275 - 113.75 = 2161.25$   
Choice (2)

48. If C, D and H are closed, then the minimum cost of travel is for A – F – J i.e. Rs.2850. Choice (3)

49. We want the  $\frac{\text{Price}}{\text{Distance}}$  to be as minimum as possible.  
It is less than 1 in only three cases i.e. A – H, B – J, C – D. Considering the cases involving above routes:

Route	Price/Distance	Taking margin of 10% into account
A – H – J	$\frac{2275}{2350}$	$\frac{2275}{2350} \times \frac{10}{11}$
A – B – J	$\frac{2945}{2860}$	$\frac{2945}{2860} \times \frac{10}{11}$

It will be the least for A – H – J and is  $\frac{2275}{2350} \times \frac{10}{11} \approx \frac{207}{235} = 0.88$   
Choice (2)

50. The cost/kilometer is the least for A – H – J and the distance is 2350 km.  
Choice (4)

### SECTION – III (RC & Verbal)

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.

**Number of words in this passage : 558**

**H**uman 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.

Triumphant Institute of Management Education Pvt. Ltd. (**T.I.M.E.**) HO: 95B, 2<sup>nd</sup> Floor, Siddamsetty Complex, Secunderabad – 500 003.

Tel : 040-27898194/95 Fax : 040-27847334 email : info@time4education.com website : www.time4education.com

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Let us consider this waiter in the café. 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 café.

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 of 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 behaviour in society.

**Solution:**

The central idea of the passage is that human society is structured on functional relationships (reciprocal roles) that coordinate human behaviour, rather than on biological relationships (which may not even be necessary). This is presented in the first paragraph, and elaborated on in the rest of the passage.

Choice 1 is inappropriate since it presents reciprocal roles as the basis, in the absence of biological links, ie. as substitutes – the passage looks at reciprocal roles as the essential basis.

Choice 2 is inappropriate since it presents biological links as the basis, in the absence of reciprocal roles – the passage does not look at the absence of reciprocal roles at all.

Choice 3 excludes both and Choice 4 includes both – these choices are therefore inappropriate.

### Choice (5)

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.

**Solution:**

The author presents the view that reciprocal roles are defined by the expectations that each party to a relationship has of the others in the relationship (and, therefore, that society has of them).

We can infer, then, that when expectations are met (or not) we, in society, would be satisfied (or offended). We can also infer that if social links were only biological they would not be based on expectations, and there would then be no social perceptions, either of satisfaction or of offence.

Choice 1 is inappropriate since, if biological linkages were the basis for social structure, they would also be the basis for a mother's role.

Choice 2 is correct – it presents the inference explained above.

Choice 3 is inappropriate – it is contrary to the hypothetical situation presented in the question.

Choice 4 is inappropriate – it is an example of a reciprocal role.

Choice 5 is not relevant to the context.

**Choice (2)**

53. It has been claimed in the passage that "some roles are more absorbing than others". According to the 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

### Solution:

The line quoted in the question is from the last paragraph of the passage.

From it we can infer that the author thinks that (as in the example of the waitress) persons in some roles would like to present something of themselves apart from (or other than) the expectations that society has of them, but do not do so. They conform to expectations instead. In this sense, expectations 'prevent' the manifestation of true self. (Sentence A)

Sentence B is not relevant as 'alignment of conception of self' would mean that persons would actually change themselves, or their sense of self, to fall in line with society's normative expectations. However, the passage does not give this idea. As explained above, the idea is that persons suppress their true selves to conform to expectations.

Sentence C is not relevant as the author does not discuss the requirement for, or acquisition of, skills and expertise. As such, sentence A alone is appropriate.

Choice (1)

**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.

**Solution:**

Statement A is erroneous because, it is incorrect to say 'returned to home'. The correction is returned home. B is incorrect because it is incorrect to say 'get my hand on' the correction is 'lay my hands on,' Statement C does not have a comma after 'that same year.' The sentence is acceptable with or without a comma. (However, the original text from which this sample is drawn, an excerpt from "From Beirut to Jerusalem" by Thomas L. Friedman has a comma.) Statement D is incorrect because the expression 'a sort of recruiter' is a parenthetical expression and has to be preceded and followed by a comma. Hence options A, B, C and D are erroneous. Only E is right in terms of grammar and usage

Choice (1)

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.

**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.

**Number of words in this passage : 582**

**E**very 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 in 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 joy and tragedy, of incomparable conquests and irredeemable losses. Adventurers of experience

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

**Solution:**

Statement A is incorrect because the expression 'once an economy is actually in recession' is a parenthetical expression. Hence 'so' should be followed by a comma. C is erroneous because the word slump should be preceded by the article 'a'. D is incorrect because 'by a temporary stimuli' is incorrect not only because it needs the singular 'stimulus', but because you move something with something and not 'by something'. Hence, the correction is 'with a temporary stimulus'. Statement E is incorrect because it has two errors. Firstly, it is incorrect to say 'in the longer term'. The standard phrase is 'in the long term'. Further, the usage of the word 'affect', which is a verb, is incorrect here. The correct word which should be used here is the noun 'effect'.

Choice (5)

56. A. It is sometimes told that democratic 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 model.  
(1) A, B & D      (2) B, C & D      (3) B & D  
(4) B only      (5) D only

**Solution:**

Statement A is incorrect because it is wrong to say 'it is sometimes told', the correction is 'it is sometimes said'. Statement C is erroneous because 'handed' should be followed by down in order to mean passed down as a legacy. Statement E is incorrect because of the word 'hence'. It should be replaced by 'but', in order to bring out the contrast implied in the sentence. Hence statements A, C and E are erroneous and B and D are grammatically correct.

Choice (3)

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.'

- 57.** In the passage, the expression "like a Madonna from a Madonna" alludes to

- (1) The difference arising as a consequence of artistic license.
- (2) The difference between two artistic interpretations.
- (3) The difference between 'life' and 'interpretation of life'.
- (4) The difference between 'width' and 'depth' of creative power.
- (5) The difference between the legendary character and the modern day singer.

**Solution:**

The line quoted in the question is from the first paragraph of the passage, in which the author indicates that 'in such a culture' the arts do not look as much at 'width' as they do 'depth', and do not create new experience but 'deepen and purify' the old. The example of the differences between 2 new horizons (meaning that we are looking at different things) refers to new experiences. The example of the differences between 2 madonnas (representations of Mary) refers to different evaluations of the same experience.

Choice 1 is irrelevant – artistic licence is not discussed in the passage.

Choice 2 is appropriate – it refers to the feature explained above

Choice 3 is inappropriate – the idea conveyed in the passage is that art evaluates experience

Choice 4 is inappropriate – as explained above, the example of the madonnas help explain the author's view of 'depth' only, not 'width'.

Choice 5 is irrelevant – there is no reference to the modern day singer.

Choice (2)

- 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 aimlessness.

- (4) Understand the elements that one has to deal with.

- (5) Delve into natural experience and real waves.

**Solution:**

The author uses the sea metaphorically, to refer to the vast areas of experience that practitioners of the arts (such as poets) draw on, and give us their interpretations of. In such manner these areas of experience periodically contribute by providing us (in society) with perceptions that enliven our existence. The example of the oarsman and the singer support this, as well as Rilke's conclusion at the end of the last paragraph.

Choice 1 is therefore the correct choice.

Choice 2 is inappropriate – the example serves to support the idea explained above.

Choice 3 is inappropriate – the actual idea is that artistic endeavour serves a valuable purpose.

Choice 4 is inappropriate – it is not about his understanding the elements that we have to deal, but his understanding the importance and place of artistic effort.

Choice 5 is inappropriate – the reference to the sea is in the manner of metaphor only. Choice (1)

- 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 revitalise and enrich the past for us.
- (5) Poets and artists who delve in flotsam and jetsam in sea.

**Solution:**

The central idea of the passage is the significance of artistic endeavour. The author explains how the arts help us with fresh perceptions of what we may already know. Through the example of The Renaissance he also explains how the arts can remind society of forgotten experience, with new

and valuable perceptions. He concludes by confirming the significance of the artist in society and culture.

The question asks what 'adventurers of experience' would refer to, not just in a line or a sentence, but according to the passage.

Choice 1 is inappropriate - the example of lifeboats is, again, by way of metaphor and does not point to what poets actually did. The passage therefore, refers to their willingness to look at things afresh, and not to their courage.

Choice 2 is inappropriate – the idea is not that artists create their own genre, but that they enliven earlier experience.

Choice 3 is merely a statement of the period to which these 'adventurers' belong.

Choice 4 is correct – it looks at the focus of the passage and explains that the term refers to those who through their creative efforts can present to society new and valuable perceptions of forgotten experience.

Choice 5 is inappropriate – the 'flotsam and jetsam at sea' is used in the manner of a metaphor.

Choice (4)

**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 commonplace. 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.

#### Solution:

The paragraph talks of how accounts are presented, with specific reference to accounts that organisations present about themselves, related as if by person(s). Since they are bodies and therefore

cannot present content in the first person, they give themselves a persona (personify themselves) to be able to present their own account in a manner that can be well understood.

Choice 1 is inappropriate – it moves away from the discussion of an organisation to a feature of what is required for effective presentation, in general.

Choice 2 is inappropriate – the paragraph refers to an organisation that personifies itself as the actor, and not to particular actors in the account being presented.

Choice 3 is inappropriate – it says personification is required for uniformity of presentation, whereas the paragraph shows that the organisation would not have a voice otherwise.

Choice 4 is inappropriate – it moves away from the idea provided in the paragraph, that Characters (and therefore personifications) are part of deep structure.

Choice 5 is correct – it completes the paragraph in a manner that provides the reader with the entire idea, as explained above.

Choice (5)

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 things, 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 invention became means of living life through images.

#### Solution:

The paragraph (clearly an extract, since it begins with 'nevertheless') talks of the value (magical allure) that photographs have always had. It then recounts the changes in technology and the way they are viewed, and the effect that these changes have had on recent generations.

Choice 1 is correct – it completes the paragraph effectively by saying that the changes we have seen do not detract from the essential value that they still have – as reminders of those we care about.

Choice 2 is inappropriate – it speaks of the value to specific persons only, and is not in keeping with the idea of value to all of us.

Choice 3 is inappropriate – while it presents a idea similar in some aspects to that in choice 1, choice 1 is better because of the connective phrase ‘yet, despite these developments..’.

Choice 4 is inappropriate - it introduces a feature that developments have made possible, but does not bring the discussion to a close.

Choice 5 is irrelevant to the content and tone of the paragraph – it makes a skewed reference to the speedy passage of time.

Choice (1)

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 redbush tea. And three mugs – one for herself, one for her secretary, and one for the client. What else does a detective agency really need? 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.

#### Solution:

The paragraph talks of Mm Ramotswe and her detective agency – first of its physical assets, and then of the abilities that she herself has.

Choice 1 is inappropriate – the landscape, or view, can only add value to a location, not to the agency.

Choice 2 is correct – Mm Ramotswe’s abilities are clearly of value to the agency (what else does a detective agency really need?) though they cannot be assets of the agency itself.

Choice 3 is inappropriate – Mm Ramotswe has intelligence in abundance, implies that she has as much as the agency needs. The statement about her intelligent secretary then serves no purpose.

Choice 4 is inappropriate – it brings in a personal attribute (good woman) that has little bearing on the discussion of her professional abilities.

Choice 5 draws attention – the paragraph does not indicate or imply that there was any ‘lack’ of possessions. In fact, it indicates that an agency does not really need more physical assets.

Choice (2)

**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.

**Number of words in this passage : 518**

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, lecturers, 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 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 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 evolves into a paradigm
  - (4) Ways of understanding a scientific tradition
  - (5) The frustrations of attempting to define a paradigm of a tradition

**Solution:**

The passage examines the different aspects that go into the makeup of a scientific tradition, and the manner in which these are sometimes related to, sometimes independent of, each other.

Choice 1 appears to be right but the author goes beyond the relationship to try to understand the scientific tradition.

Choice 2 is inappropriate – the discussion on how a historian would isolate a particular 'loci' is only to explain how the relationships can be discovered or understood.

Choice 3 is inappropriate – the discussion on the extent of shared beliefs presents only one of the aspects of the scientific tradition.

Choice 4 is appropriate – para 2 shows the author trying to understand a scientific tradition. The last sentence of para 2 and the first two sentences of para 3 show that even out of frustration same understanding may be achieved.

Choice 5 is inappropriate – the frustration, as opined by the author is in attempting to search for sets of rules.

Choice (4)

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 group of scientist 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

**Solution:**

In paragraph 1 the author examines the isolation of 'the particular loci' with reference to 'a given specialty'. He also explains what he considers would be the paradigms of this specialty (or 'corresponding community' 'mature community') and that these can be identified without much difficulty. These paradigms are then to be compared so as to determine which of them are broadly accepted in the community.

Choice 1 and 2 are inappropriate – the reference in the passage is not to groups of scientists in one or more research laboratories, but to the shared beliefs of scientists of a common specialty.

Choice 3 is correct – it reflects the idea discussed above. Choice 4 and 5 are inappropriate – the reference in the passage is not to global trends or evolving trends, but to the shared beliefs of scientists of a common specialty.

Choice (3)

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 type of paradigm that may emerge from a tradition.
  - (5) Paradigms are a general representation of rules and beliefs of a scientific tradition.

**Solution:**

Choice 1 is inappropriate – it is seen from the last paragraph paradigms guide scientific research, they do not define a tradition. Definition, or establishment of firm parameters, would amount to rules.

Choice 2 is inappropriate – paragraph 2 indicates how rules may sometimes be abstracted from paradigms, to be used in research. Whether the research would benefit as a result is not indicated. Thereafter, the last paragraph indicates that the lack of rules will not prevent a paradigm from guiding research.

Choice 3 is inappropriate – the passage does not indicate that the acceptance of a tradition by renowned scientists is a prerequisite for the emergence of a paradigm. What it indicates is that scientists may sometimes accept the ideas of more renowned scientists as composites of their paradigms.

Choice 4 is inappropriate – there is no reference to or indication of different isolation mechanisms to be chosen from.

Choice 5 is correct – It is clear from the passage that paradigms are sets of commonly shared beliefs. Paragraph 2 (in the lines explaining that rules can be abstracted from paradigms) shows that paradigms represent those views from which rules may be drawn.

Choice (5)

**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 unacceptability.

Amit's explanation for missing the meeting 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

**Solution:**

The cricket council here is taken as plural because the sentence further goes on to describe the council as being 'at sixes and sevens over new rules i.e., the members were divided (in disagreement with each other) over the new rules. Hence it is 'were' and 'are'

Critics 'censure' or criticize 'To censor' is to remove or prohibit after inspection or examination and hence does not apply.  
The first three options are B B B.

An account of something or an explanation would be 'credible' i.e., believable.  
'Discrete' means distinct ' whereas 'discreet' means 'cautious' or tactful which is more appropriate in this context  
Thus B B B B A is correct. Choice (3)

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] / **compliment** [B] was backhanded.

- (1) BABAB      (2) ABBBA      (3) BAABA  
(4) BBAAB      (5) ABABA

**Solution:**

'Farther' is used when we talk about distance.  
'Further' means 'more' which is the meaning in which it is used in this context. Hence it has to be  
The further he pushed-----'

It was a 'historic' event or an event considered important and likely to remain in memory. 'Historical' means something connected with the past and hence is incorrect to use in this context.

It was a healthy distrust meaning doubt or suspicion.  
'Mistrust' is when persons are not trusted, is not appropriate in the context. The use of 'healthy' warrants the use of 'distrust.'

Hence it is A B A

**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.

**Number of words in this passage : 603**

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.

It is appropriate to say ' a true story', not a real story. 'Compliment' is a flattering remark or a comment whereas 'complement' means a companion or an addition. Thus ABABA is correct      Choice (5)

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

**Solution:**

'Regretful' means to feel apologetic. Here the person is 'regretful' or apologises for not accepting the invitation. Regrettable means that you consider something wrong or improper. Hence 'regretfully' is the apt choice.

'Sensuous' means appealing to the senses and is more apt whereas sensual refers to physical pleasure.

'Beside yourself with something' is an idiomatic expression and it means you are unable to control yourself because of the strength of your emotions. Hence 'beside himself' is the correct expression.

'Stationary' means something that is static which is the appropriate word to be used in this context.

'Water rose above the danger mark' as 'above' here refers to the level and hence is more appropriate. Thus B B B A B is correct.      Choice (2)

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 endowment 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.

**Solution:**

The answer to this question is drawn from paragraph 2 (A methodology that has proved useful.....) onwards till the first 2 sentences of paragraph 3 (.... within each of the continents.) These lines explain that areas have different resource strengths (endowments), as exemplified by the studies of the Polynesian islands. It is useful to compare the situations between continents and it would help even more to consider comparisons between the larger islands (size) which are quite isolated, examples being Japan, etc., and continents. This points to the view that 'valuable insights' (clear understanding) can be gathered in this manner.

These ideas are best represented in Choice 4.

Choice 1 is inappropriate – it does not give a reason for value, only that aspects of difference may interest us.

Choice 2 is inappropriate – it mentions that historians would have more study points, but not of how this would amount to valuable insights.

Choice 3 is inappropriate – for the same reasons as choice 1

Choice 5 is inappropriate – arousing curiosity is not a reason why the islands can provide valuable insight.

Choice (4)

- 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 outcomes depend upon a large number of factors and hence prediction 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 long-term predictions.
- (5) Historical sciences suffer from the inability to conduct controlled experiments and therefore have explanations based on a few long-term factors.

**Solution:**

The difficulties in prediction are spoken of in paragraph 1 (To varying degrees each of..... become averaged out). In essence, a variety of factors – the inability to experiment, the complex and numerous variables that mean each system is unique and universal laws cannot be formulated, and the difficulty in estimating the characteristics and behaviour patterns that could develop. Hampered by these features, prediction in history can only be very broad.

Choice 1 is inappropriate – broad explanations are presented as the reasons for difficulty in prediction, rather than the other way round (as explained above).

Choice 2 is correct – it reflects the ideas discussed above.

Choice 3 is inappropriate – There is no indication that historical sciences are 'not interested' in a multitude of minor factors. As the passage goes on to explain, the difficulties in prediction mean that the historical sciences can only make broad predictions when the unique features of a multitude of small events become averaged out.

Choice 4 is incorrect – historians can make broad predictions only (not long term), as explained above. This does not imply that they are 'not interested' in anything else.

Choice 5 is incorrect – This looks at only one of the limiting factors, and not the rest (as explained above).

Choice (2)

- 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.

**Solution:**

The answer to this question is drawn from the same content used for Q.69 – the ideas in which are reflected in Choice 2. The author expresses the view that complex societies on large islands offer good opportunities for study.

Choice 1 and 3 are inappropriate as the passage does not imply that significant opportunities have been missed. On the other hand, it points to the opportunities available.

Choice 4 is incorrect – the passage talks of the difficulties that the historians face and suggests some methods that can be used. It does not indicate the ‘inability’ of historians.

Choice 5 is inappropriate – while paragraph 2 does explain that cultural anthropologists study long terms developments that have occurred in specific communities (referred to as ‘natural experiments’), there is no idea that they have thereby ‘overcome’ the problem of confounding variables.

Choice (2)

**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 work 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) EBCD

**Solution:**

Obviously E follows A as it carries the idea (expressed in A) forward. C follows E as ‘it’ in C refers to the ‘academic literature’ mentioned in E. Statement B cites an instance to show that the academic literature is ‘inconclusive’. Hence C and B are linked. Statement D which says that regardless of any particular piece of work, it is difficult to establish connections between family changes and economic factors, ideally sums up the paragraph. Hence ECBD is the correct order of sentences which follow A.

Choice (4)

- 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 “good mother”.
- 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 within 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) EDCB      (5) BCDE

**Solution:**

Clearly E has to follow A because it is a continuation of A as it talks about a ‘third discourse’. ‘These frameworks’ in statement D refers to the frameworks mentioned in E. Hence E and D are linked. Statement B follows D by talking about yet another feature of contemporary reproduction and motherhood. It also expresses the idea that constructions of good mothering have not always been conceived in the manner expressed in the preceding sentences. Statement C elaborates on this idea by citing the example of ‘historical work’ and concludes the paragraph by saying that the changes mentioned have led to a

reframing of modern discourses that pattern pregnancy and motherhood, thus leading to an acceptance of the need for expert management. Hence EDBC.

Choice (1)

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 parities at central, provincial and district levels; direct elections for the presidency (since 2004); and radical changes the 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

**Solution:**

Statement B ideally follows A by elaborating on the 'dramatic shifts' which have taken place in the governance of Indonesia ever since the fall of Soeharto's regime. Statement C is a continuation of B as it talks about changes, other than those mentioned in B. 'Such developments' in D refer to the 'developments' mentioned in B and C. Statement E is conclusive in nature. Hence BCDE is the correct order of sentences.

Choice (5)

75. A. I had six thousand acres of land, and 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

**Solution:**

C is a better statement to follow A as it explains who the 'squatters' are and how they came to occupy the author's land. Statement B which explains how the squatter's land was different from the rest of the farm, by giving an example of the maize crop, follows statement C. E is a continuation of B as it gives a vivid description of other crops which were cultivated on the farm. Statement D which, begins with the line 'The Kikuyu also grew....', makes it obvious that D is the concluding statement, hence CBED is the correct order of sentences.

Choice (3)

