# CAT 2007 Actual Paper

## Answers and Explanations

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

<table>
<thead>
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<th>Total attempted</th>
<th>Total correct</th>
<th>Total wrong</th>
<th>Net Score</th>
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<td>26 to 50</td>
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</table>
1.2 Sum of the odd integers in the set $S$

$$\sum = \frac{n}{2}(2\times3 + (n-1)\times2)$$

$$= \frac{n}{2}(2n + 4) = n\times(n + 2)$$

Therefore, the average of the odd integers in set $S$ is $n + 2$

Sum of the even integers in the set $S$

$$\sum = \frac{n}{2}(2\times2 + (n-1)\times2)$$

$$= \frac{n}{2}(2n + 2) = n\times(n + 1)$$

Therefore, the average of the even integers in the set $S = n + 1$

Hence, $X - Y = (n + 2) - (n + 1) = 1$

2.5 The total age of all the eight people in the family = 231

As per the information given in the question, the total age of all the people in the family = 231 + 3 × 8 – 60 + 0 = 195

Similarly, the total age of the people in the family four years ago = 195 + 3 × 8 – 60 + 0 = 159.

Therefore, the current average age of all the people in the family = $\frac{159 + 32}{8} = 24$ years.

3.1 $f(1) + f(2) + f(3) + \ldots + f(n) = n^2f(n), f(1) = 3600.$

For $n = 2$,

$$\Rightarrow f(1) + f(2) = 2^2f(2) \Rightarrow f(2) = \frac{f(1)}{(2^2 - 1)}$$

For $n = 3$,

$$\Rightarrow f(3) = 3600 \times \left(\frac{2^2}{2^2 - 1}\right) \times \left(\frac{1}{3^2 - 1}\right)$$

Similarly,

$$f(9) = 3600 \times \frac{2^2 \times 3^2 \times 4^2 \ldots 8^2}{(2^2 - 1)(3^2 - 1)(4^2 - 1)\ldots(8^2 - 1)}$$

Therefore, $f(9) = 80$

4.3 Let the number of currency 1 Miso, 10 Misos and 50 Misos be $x, y$ and $z$ respectively.

$$\Rightarrow x + 10y + 50z = 107$$

Now the possible values of $z$ could be 0, 1 and 2.

For $z = 0$: $x + 10y = 107$

Number of integral pairs of values of $x$ and $y$ that satisfy the equation $x + 10y = 107$ will be 11. These values of $x$ and $y$ in that order are (7, 10); (17, 9); (27, 8); (37, 7); (47, 6); (57, 5); (67, 4); (77, 3); (87, 2); (97, 1).

For $z = 1$: $x + 10y = 57$

Number of integral pairs of values of $x$ and $y$ that satisfy the equation $x + 10y = 57$ will be 6. These values of $x$ and $y$ in that order are (7, 5); (17, 4); (27, 3); (37, 2); (47, 1) and (57, 0).

For $z = 2$: $x + 10y = 7$

There is only one integer value of $x$ and $y$ that satisfies the equation $x + 10y = 7$ in that order is (7, 0).

Therefore, total number of ways in which you can pay a bill of 107 Misos = $11 + 6 + 1 = 18$

5.4 Suppose the cheque for Shailaja is of Rs. $X$ and $Y$ paise

As per the question,

$$3 \times (100X + Y) = (100Y + X) - 50$$

$$\Rightarrow 299X = 97Y - 50$$

$$\Rightarrow Y = \frac{299X + 50}{97}$$

Now the value of $Y$ should be a integer.

Checking by options only for $X = 18$, $Y$ is a integer and the value of $Y = 56$

5.5 $1 + \frac{4}{m + n} = \frac{1}{12}, n < 60$

$$\Rightarrow \frac{1}{m} + \frac{\frac{4}{3}}{n} = \frac{n - 48}{12n}$$

$$\Rightarrow m = \frac{12n}{n - 48}$$

Positive integral values of $m$ for odd integral values of $n$ are for $n = 49, 51$ and 57.

Therefore, there are 3 integral pairs of values of $m$ and $n$ that satisfy the given equation.

7.3 Using A: $W_B = 45.5$ and $W_A = 44.5$

Using B: Weight of Deepak = 70kg (Only after using statement A)

This is sufficient to find weight of Poonam using the data given in the question statement. Hence option (3) is correct choice.

8.2 Using A: Inner radius of the tank is at least 4 m. So volume $= \frac{4}{3}\pi r^3$ where $4 < r < 10$

This volume can be greater as well as smaller than 400 for different $r$.

Using B: The given data gives the volume of the material of tank, which can be expressed as $\frac{4}{3}\pi(10^3-r^3)$, which will give the value of $r$ which is unique and sufficient to judge if the capacity is adequate. Hence option (2) is correct choice.
9. 1 Using A: x = 30, y = 30 and z = 29 will give the minimum value.
Using B: Nothing specific can be said about the relation between x, y and z.
Hence option (1) is correct choice.

10. 1 Using A: \( \frac{OM}{OL} = \frac{2}{1} \)

But if O lies on JK, maximum possible value of \( \frac{OM}{OL} \) is \( \frac{\sqrt{2}}{1} \) (when O lies on K)
So, Rahim is unable to draw such a square
Using B: Nothing specific can be said about the dimensions of the figure.
Hence option (1) is correct choice.

For questions 11 and 12:
Let the cruising speed of the plane and the time difference between A and B be y km/hr and x hours respectively.
Distance between A and B = 3000 kilometers. For, the plane moving from city A to City B: 
\[ 3000 = (7 - x) \times (y - 50) \]
This is satisfied for \( x = 1 \) and \( y = 550 \). These are the only values given in the options that satisfy the above equation.

11. 4 12. 2

For questions 13 and 14:
To maximise Shabnam’s return we need to evaluate all the given options in the question number 7. Assume Shabnam had one rupee to invest. Let the return be denoted by ‘r’.
Consider the option (30% in option A, 32% in option B and 38% in option C): If the stock market rises, then 
\[ r = 0.1 \times 0.3 + 0.5 \times 0.32 = 2.5 \times 0.38 = 0.653 \]
If the stock market falls, then 
\[ r = 0.1 \times 0.3 - 3 \times 0.32 + 2 \times 0.38 = -0.197 \]
Consider option (100% in option A): This will give a return of 0.1%.
Consider option (36% in option B and 64% in option C): If the stock market rises, then 
\[ r = 5 \times 0.36 - 2.5 \times 0.64 = 0.2 \]
If the stock market falls, then 
\[ r = -3 \times 0.36 + 2 \times 0.64 = 0.2 \]
Consider option (64% in option B and 36% in option C): If the stock market rises, then 
\[ r = 5 \times 0.64 - 2.5 \times 0.36 = 2.1 \]
If the stock market falls, then 
\[ r = -3 \times 0.64 + 2 \times 0.36 = -1.2 \]
Consider option (1/3 in each of the 3 options): If the stock market rises, then 
\[ r = 0.1 \times 0.33 + 5 \times 0.33 - 2.5 \times 0.33 = 0.858 \]
If the stock market falls, then 
\[ r = 0.1 \times 0.33 - 3 \times 0.33 + 2 \times 0.33 = -0.297 \]
We can see that only in option (36% in option B and 64% in option C), Shabnam gets an assured return of 0.2% irrespective of the behaviour of the stock market. So right option for questions number 13 is (0.20%) and question number 14 is (36% in option B and 64% in option C).

13. 3 14. 2

For questions 15 and 16:
15. 4 The number of members in the set \( S = \binom{n}{2} \), where n is greater than 4.
Each member of S has two distinct numbers.
Let us say \((1, 2)\) is one of the members of S.
To find the number of enemies each member of S will have be equal to
\[ n-2C_2 = \frac{n^2-5n+6}{2} \]
16. 4 Considering any two members of S, that are friends there will be 1 number of the pairs that will be common. The common element of these pairs will have \( n - 3 \) pairs, with the remaining \( n - 3 \) elements. There will be one more member made up of the remaining two constituent elements which are not same. In total there are \( n - 3 + 1 = n - 2 \) other members of S that are common friends of the chosen two pairs or numbers.

Alternative Method for questions 15 and 16:
For \( n = 6 \), the number of elements in the set \( S = \binom{(1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 3), (2, 4), (2, 5), (2, 6), (3, 4), (3, 5), (3, 6), (4, 5), (4, 6) and (5, 6)}{2} \)
Let us say \((1, 2)\) is one of the members of S.
Each member of S has two distinct numbers.
Friends of the member \((1, 2)\) in the set S are \((1, 4), (1, 5), (1, 6), (2, 3), (2, 4), (2, 5), (2, 6), (3, 4), (3, 5), (3, 6), (4, 5), (4, 6) and (5, 6).
Checking by options, this is only satisfied by
\[ \frac{n^2-5n+6}{2} \]
Hence \( \frac{n^2-5n+6}{2} \) is the correct choice.
16. 4 For \( n = 6 \) lets consider the members \((1, 2)\) and \((1, 3)\)
Friends of the member \((1, 2)\) in the set S are \((1, 4), (1, 5), (1, 6), (2, 3), (2, 4), (2, 5), (2, 6), (3, 4), (3, 5), (3, 6), (4, 5), (4, 6) and (5, 6).
The number of members of S that are common friends to the above member are 4, i.e. \((1, 4), (1, 5), (1, 6), (2, 3)\).
So the answer is \( n - 2 \).
17. 1 In each team, there are two players, one it shares with \( T_{j-1} \) and other with \( T_{j+1} \). Other \((k - 2)\) players team \( T_j \) shares with no other team. So, total players which play for only one team.
\[ = (k - 2)n \]
One player is common in \( T_1 \) and \( T_2 \), one in \( T_2 \) and \( T_3 \) and so on.
Number of such players = number of pairs = \( n \)
So, total players = \( (k - 2)n + n = n(k - 1) \)
18. 5 Let the four-digit number be denoted by aabb = 11 \times (100a + b).
Now since aabb is a perfect square, 100a + b should be a multiple of 11.
The only pairs of values of a and b that satisfy the above mentioned condition is a = 7 and b = 4. Clearly 7744 is a perfect square.

19. 2 Using the given data –
\[
\frac{(240 + 40b + 40^2c) - (240 + 20b + 20^2c)}{240 + 20b + 20^2c} = \frac{2}{3}
\]
and
\[
\frac{(240 + 60b + 60^2c) - (240 + 40b + 40^2c)}{240 + 40b + 40^2c} = \frac{1}{2}
\]
Solving the above equations, \(c = 10\) and \(b = 10\)

So cost for producing x units = 240 + 10x + \(\frac{x^2}{10}\)
Profit earned from x units
= 30x - \(240 + 10x + \frac{x^2}{10}\)
= \(20x - \frac{x^2}{10} - 240\)
= 760 - \(x - 100\)
For maximum profit, \(x - 100 = 0\)
\[\Rightarrow x = 100.\]

20. 4 Maximum profit = Rs. 760

21. 3 Price of Darjeeling tea (in rupees per kilogram) is 100 + 0.10n
Price of Ooty tea (in rupees per kilogram) is 89 + 0.15n
Price of the Darjeeling tea on the 100th day = 100 + 0.1 \times 100 = 110

Number of days in the months of January, February, March and April in the year 2007 = 31 + 28 + 31 + 30 = 120.
Therefore, the price of both the tea will be equal on 20th May.

22. 3

If P and Q lie on the intersections of the circles as shown in the figure given below.

In this case triangle APQ is equilateral. So the maximum possible measure of the angle AQP is 60°. The answer is between 0 and 60.

23. 2 Let \(f(x) = ax^2 + bx + c\)
At \(x = 1, \ f(1) = a + b + c = 3\)
At \(x = 0, \ f(0) = c = 1\)
The maximum of the function \(f(x)\) is attained at
\[x = -\frac{b}{2a} = 1 = \frac{a - 2}{2a}\]
\[\Rightarrow a = -2 \text{ and } b = 4\]
\[\therefore f(x) = -2x^2 + 4x + 1\]
Therefore, \(f(10) = -159\)

For questions 24 and 25:
Using the given expressions —
\[a_1 = p \quad b_1 = q\]
\[a_2 = pq \quad b_2 = q^2\]
\[a_3 = p^2q \quad b_3 = pq^2\]
\[a_4 = p^2q^2 \quad b_4 = pq^3\]
\[a_5 = p^3q^2 \quad b_5 = p^2q^3\]
\[a_6 = p^3q^3 \quad b_6 = p^2q^4\]
and so on

24. 1 \[a_n + b_n (n \text{ is even}) = \left( p^n q^n \right) \frac{n}{2}(p + q)\]
25. 4 \[ a_n + b_n(n \text{ is odd}) = p^{\frac{n-1}{2}} q^{\frac{n-1}{2}} + p^{\frac{n+1}{2}} q^{\frac{n+1}{2}} \]

\[ = \left( p + q \right) \left( pq \right)^{\frac{n-1}{2}} \]

Substituting \( p = \frac{1}{3} \) and \( q = \frac{2}{3} \)

\[ a_n + b_n = \left( \frac{2}{9} \right)^{\frac{n-1}{2}} \]

Substituting \( n = 7 \), \( a_n + b_n > 0.01 \)

Substituting \( n = 9 \), \( a_n + b_n < 0.01 \)

Hence smallest value of \( n \) is 9

26. 1 The diet should contain 10% minerals and only two ingredients contain 10% minerals namely O and Q. Hence, only by mixing O and Q, a diet with 10% minerals can be formed. Hence, there is only one way.

27. 4 None of the choices among (1), (2) and (3) can be used to form the diet with 10% fat and atleast 30% protein. For Q and S to form the diet with 10% fat and at least 30% protein, let us suppose that they are mixed in \( x : y \) ration. Then,

\[ \frac{x(50) + y(0)}{x + y} = 10 \]

\[ \Rightarrow x : y = 1 : 4 \]

Cost per unit = \( \frac{1(200) + 4(100)}{5} = Rs.120 \)

Similarly, for R and S, cost per unit = Rs. 200 . : Cost per unit is lowest for Q and S.

28. 5 To make a diet with P, Q and S having atleast 60% carbohydrates, the proportion of P should be the maximum and the other two should be minimum to get the lowest per unit cost. Options (2) and (5) satisfies this but the lowest cost per unit can be achieved when P, Q and S are mixed in the proportion 4 : 1 : 1.

29. 5 As the ingredients are mixed in equal amounts, so we can take the average of the constituent percentage of the elements used. Only option (5) satisfies all the conditions.

30. 1 From statement A, it is clear that 40% of top academic performers are athletes and that is equal to 10. So total number of academic performers can be calculated. Statement B does not provide any relevant information. So the answer is (1).

31. 4 Statement A and B alone are not sufficient but if both are combined, then we can form the following sequence:

\[
\begin{array}{c}
1 \\
2 \\
3 \\
4 \\
5 \\
D \\
E \\
B \\
C \\
A
\end{array}
\]

So the answer is (4).

32. 3 Statement A alone is sufficient because 10% of the female employees have engineering background, 70% of the employees are females, so 7% of the employees are female and having engineering background. Hence, 18% of the employees are male and having engineering background. From statement B, we know the number of male employees having engineering background. So, the percentage of male employees having engineering background can be calculated. So, the answer is (3).

33. 5 Statement A alone is not sufficient because it is not giving any information about the opponent. Statement B alone is also not sufficient because it is not giving any information regarding the performance of Mahindra & Mahindra in the second half. Even if both the statements are used together, we will get two cases:

\[
\begin{array}{c|c|c}
M & M & 0 \\
Opponent & 3 & 4
\end{array}
\]

So in one case, match is drawn and in the other case, it is won by Mahindra & Mahindra. Hence, the answer is (5).

For questions 34 to 37:

Looking at the values in the table one can easily conclude that the costs which are directly proportional to the change in volume of proportion are ‘Material’, ‘Labour’ and ‘Operating cost of machines’. Rest of the costs are all fixed costs. If ‘\( x \)’ is the number of units produced in 2007, then the total cost of production would be

\[ C = 9600 \text{ (Fixed cost)} + 100x \text{ (Variable cost)} \]

Variable cost = 100x because as the number of units for 2006 is 1200 and variable cost for that is 120000 i.e. 100 times the number of units.

34. 2 Total cost = 9600 + 100 \times 1400 = 149600

\[ \text{Cost per unit} = \frac{149600}{1400} = 107 \text{ (approx.)} \]

35. 3 To avoid any loss the total selling price should be equal to the total cost price. If ‘\( x \)’ units are produced and selling price of each unit is 125 Rs.

Therefore, \( 125x = 9600 + 100x \)

\[ 25x = 9600 \]

\[ \Rightarrow x = 384 \]

Hence, 384 units should be produced.
36. 5 Here, fixed cost is Rs.9600 and the variable cost is Rs.100x, where x is number of units produced. Hence, profit is maximum if x is maximum. Therefore, 2000 units will give maximum profit.

37. 1 If the company sells a maximum of 1400 units, the selling price is fixed at Rs. 125 per unit. If more than 1400 units are sold, the selling price is reduced to Rs. 120 per unit. The company cannot sell more than 1700 units.

To earn maximum profit at a unit selling price of Rs. 125, the company must sell 1400 units. The maximum profit earned, denoted by $P_0$, is calculated as below:

\[ P_0 = 125 \times 1400 - (9600 + 100 \times 1400) = Rs. 25400 \]

Now if the company sells an $x$ number of units ($x > 1400$) then the profit earned will be:

\[ P_x = 120 \times x - (9600 + 100 \times x) = 20 \times x - 9600 \]

The minimum value of $x$ for which $P_x$ will be more than $P_0$ must satisfy the following inequality:

\[ 20 \times x - 9600 > 25400 \]
\[ x > 1750 \]

As only a maximum of 1700 units can be sold, $P_x$ will never be more than $P_0$. Hence the maximum profit that can be earned is Rs. 25400 only. Hence (1) is correct.

**For questions 38 to 41:**

From the given information the following table can be formed:

<table>
<thead>
<tr>
<th>Class</th>
<th>M</th>
<th>F</th>
<th>V</th>
<th>NV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 12</td>
<td>48</td>
<td>32</td>
<td>32</td>
<td>48</td>
<td>80</td>
</tr>
<tr>
<td>Class 11</td>
<td>44</td>
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<td>40</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>Secondary Section</td>
<td>288</td>
<td>352</td>
<td>352</td>
<td>288</td>
<td>640</td>
</tr>
<tr>
<td>Total</td>
<td>380</td>
<td>420</td>
<td>424</td>
<td></td>
<td>800</td>
</tr>
</tbody>
</table>

38. 2 From the above table

Percentage of male students in the secondary section

\[ \frac{288}{640} \times 100 = 45\% \]

39. 5 From the above table

Male vegetarians = \[ \frac{25}{100} \times 32 = 8 \]

Female vegetarians = \[ 32 - 8 = 24 \]

Male non-vegetarians = \[ 48 - 8 = 40 \]

So, their difference is 40 – 24 = 16.

40. 1 Percentage of vegetarian students in Class 12

\[ \frac{32}{80} \times 100 = 40\% \]

41.* From the main table

<table>
<thead>
<tr>
<th>Class</th>
<th>M</th>
<th>F</th>
<th>V</th>
<th>Male Veg</th>
<th>Female Veg</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 12</td>
<td>48</td>
<td>32</td>
<td>32</td>
<td>48</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Class 11</td>
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<td>36</td>
<td>40</td>
<td>40</td>
<td>80</td>
<td></td>
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<tr>
<td>Secondary Section</td>
<td>288</td>
<td>352</td>
<td>352</td>
<td>288</td>
<td>640</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>380</td>
<td>420</td>
<td>424</td>
<td></td>
<td>800</td>
<td></td>
</tr>
</tbody>
</table>

*This question is wrong because the number of Male vegetarian cannot be greater than 288.

42. 3 The cost of angioplasty, hip replacement and a knee replacement (in US Dollars ‘000) in the given countries is as follows.

<table>
<thead>
<tr>
<th>Country</th>
<th>India</th>
<th>Thailand</th>
<th>Malaysia</th>
<th>Singapore</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angioplasty</td>
<td>11+5</td>
<td>13+5</td>
<td>11+6</td>
<td>13+4</td>
<td>57</td>
</tr>
<tr>
<td>Hip replacement</td>
<td>9+7</td>
<td>12+5</td>
<td>10+8</td>
<td>12+5</td>
<td>43</td>
</tr>
<tr>
<td>Knee replacement</td>
<td>8.5+9</td>
<td>10+6</td>
<td>8+4</td>
<td>13+4</td>
<td>40</td>
</tr>
<tr>
<td>Total cost</td>
<td>49.5</td>
<td>51</td>
<td>47</td>
<td>51</td>
<td>140</td>
</tr>
</tbody>
</table>

The cheapest is in Malaysia.

43. 1

<table>
<thead>
<tr>
<th>Country</th>
<th>India</th>
<th>Thailand</th>
<th>Malaysia</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee replacement</td>
<td>8.5+9</td>
<td>10+6</td>
<td>8+4</td>
<td>13+4</td>
</tr>
<tr>
<td></td>
<td>17.5</td>
<td>16</td>
<td>12</td>
<td>17</td>
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<tr>
<td></td>
<td></td>
<td>51</td>
<td>47</td>
<td>51</td>
</tr>
</tbody>
</table>

Clearly, India has the highest cost for knee replacement surgery.

44. 4 In India, total cost in US$ = 3000 + 5000 + \[ \frac{1500}{32.89} \]

(transportation cost)

= 8456.06

In Thailand, total cost in US$ = 4500 + 6000 = 10,500

Difference in amount is 10,500 – 8456.06 = US$ 2044

= 67,500 Bahts

45. 2 In India, total cost for spiral fusion in US$ =

\[ \frac{5500 \times 40.928}{35} = 6431.5 \]

In Singapore, total cost for spiral fusion in US$ = 9000 – 6431.5 = 2568.5 = 2500
46. 4 For the shortest route, we have to consider the path A-C-F-J.
The table given below shows the distance and the corresponding price.

<table>
<thead>
<tr>
<th>Path</th>
<th>Distance</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-C</td>
<td>790</td>
<td>1350</td>
</tr>
<tr>
<td>C-F</td>
<td>410</td>
<td>430</td>
</tr>
<tr>
<td>F-J</td>
<td>970</td>
<td>1150</td>
</tr>
<tr>
<td>Total</td>
<td>2170</td>
<td>2930</td>
</tr>
</tbody>
</table>

Hence, the price for travelling by the shortest route is Rs. 2930.

47. 2 For the lowest price we have to consider the path A-H-J.
The table given below shows the distance and the corresponding price.

<table>
<thead>
<tr>
<th>Path</th>
<th>Distance</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-H</td>
<td>1950</td>
<td>1850</td>
</tr>
<tr>
<td>H-J</td>
<td>400</td>
<td>425</td>
</tr>
<tr>
<td>Total</td>
<td>2350</td>
<td>2275</td>
</tr>
</tbody>
</table>

If the company charges 5% below the minimum price of Rs. 2275 then it should charge $0.95 \times 2275 = Rs. 2161$

48. 3 If the airports C, D and H are closed, then the passenger must follow the path A-F-J for minimum price.
The table given below shows the distance and the corresponding price.

<table>
<thead>
<tr>
<th>Path</th>
<th>Distance</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-F</td>
<td>1345</td>
<td>1700</td>
</tr>
<tr>
<td>F-J</td>
<td>970</td>
<td>1150</td>
</tr>
<tr>
<td>Total</td>
<td>2315</td>
<td>2850</td>
</tr>
</tbody>
</table>

So the corresponding minimum price paid by a passenger is Rs. 2850.

49. 2 For minimum cost per km, we have to consider the path A-H-J.
From solution of question 47, we know that the distance of path A-H-J is 2350 km and the price is Rs. 2275.
The price includes a margin of 10%.
So the minimum cost per km

$$\frac{2275 \times 10}{11} \times \frac{1}{2350} = 0.88$$

50. 4 For minimum cost per km, again we have to consider the path A-H-J as illustrated in the solution of question 49.
The distance of path A-H-J is 2350 km.

51. 5 ‘Reciprocal roles determine normative human behaviour in society’.
This is the main idea of the passage that is carried throughout. Note that ‘role of biology’ is negated and ‘reciprocal roles’ are affirmed in paragraph 1 and 2.

52. 2 ‘We would not have been offended by the father playing his role “tongue in cheek”.
All the other options would have been false if biological linkages would have structured human society.

53. 4 The last para where the author mentions the examples of a waitress and a clergymen and a driver refers to the alignment of self with the rules being performed and society preventing manifestation of the true self.

54. 1 C and E
In (A) ‘to’ is redundant.
In (B) ‘hands on about Israel’.
In (D) a Shaliach, a sort of recruiter to Minneapolis.

55. 5 B only
In (A) ‘into’ should be used in place of ‘in’
In (C) the article is missing before the word ‘slump’
In (D) the singular form ‘stimulus’ should be used in place of ‘stimuli’
In (E) ‘effect’ should be used in place of ‘affect’

56. 3 B and D
In (A) ‘said’ should be used instead of ‘told’
In (C) ‘handed down to’ should be used in place of ‘handed to’
In (E) a subject is required after ‘hence’. Another way of correcting (E) is to replace ‘hence’ by ‘but’.

57. 2 ‘The difference between two artistic interpretations’
Refer the last three lines of the 1st para where the author talks about the gap between the two artistic interpretations within the depth of the creative power and doesn’t mention width.

58. 1 ‘Define the place of the poet in his culture’.
The lines starting with “But suddenly I understood ….. “define the position of the poet in his culture.

59. 4 Refer to the 5th line of the 2nd para. Here the term “adventures of experience” refers to the poet & artists who over vitalize and enrich the past for us.

60. 5 “The personification of a whole organization is a textual device ….” is the choice which continues the theme in the last two lines of the paragraph in the best possible way. The latter half of the paragraph is talking about personification of whole organizations and this is the choice which completes the paragraph satisfactorily. The choice justifies why whole organizations are personified even though they cannot speak as characters.

61. 1 ‘Yet despite these technical developments…… …care about’.
In the first line of the paragraph the author speaks about the magical allure still retained by photographs. Then he goes on to describe the negative effects of technological advancements on the same. Thus, in line with the first idea (1) describes how photographs are still holding out against these negative effects.
62. 2 ‘No inventory would ever include those, of course’. The para starts with listing out ‘the inventory’. The option which says ‘what she lacked…………natural shrewdness’ is beyond the scope of the argument. All the options can be easily eliminated. ‘Those’ in the option ‘No inventory would ever include those, of course’, refers to human intuition and intelligence of Mma Ramotswe.

63. 4 ‘ways of understanding a scientific tradition’. The idea is implicitly throughout the passage.

64. 3 ‘Loyalty to a certain paradigm of scientific inquiry’. This is an analogy question where we can draw comparison from the line that says “loci of commitment that have been described as accepted rules.” Options 1 and 2 talk about a biochemical structure rather than conformity. It is ‘loyalty to something’ and not ‘loyalty among people’ talked about in the passage. Option 4 talks about adherence to an accepted norm which goes out of the scope of the argument. Option 5 talks about evolving trends which is not mentioned in the paragraph. Therefore option (3) is the best choice.

65. 5 From the theme and tone of the passage it can be inferred that paradigms are predominant as compared to rules. It is difficult to define rules. Paradigms in part determine normal science and also need not depend on the formulation of rules and assumptions. Hence the author would agree with the choice “Paradigms are a general representation of rules and beliefs of a scientific tradition.”

66. 4 AABBA
Cricket Council is a collective noun so it takes a singular verb. The reference is made to a group as a whole and not to an individual.
Censure implies harsh criticism.
Censor means to put a ban on something objectionable.
Credulous means tending to believe without evidence.
Discretely means distinct whereas discreetly means to carefully avoid social embarrassment or distress; tactful.

67. 5 ABABA
Farther is used specifically for physical distance. Further is not used in the physical context and is used to indicate something of a greater degree or extent.
Historical is something pertaining to history while historic is something significant.
Distrust means having a sense of fear anticipation of discomfort of danger whereas mistrust is believing that a particular party has a hidden agenda.
True means not false or not fictional while real means existing or occurring in the physical world.
Compliment means a remark or an act expressing respect or admiration
Complement means a person or thing that completes something