1. Note that the price of Darjeeling tea remains constant after the 100th day (n = 100).
If the prices of the two varieties of tea become equal before n = 100, then
\[ 100 + 0.1n = 89 + 0.15n \]
\[ \therefore n = 220, \text{ which is not possible. (since n is assumed to} \]
\[ \quad \text{be less than 100)} \]
\[ \therefore \text{The prices of the two varieties will be equal after} \]
n = 100,
i.e., when the price of Darjeeling tea
= 100 + 0.1 \times 100
= 110
\[ \therefore 89 + 0.15n = 110 \]
\[ \therefore n = 140 \]
2007 is not a leap year. Number of days till 30th April
= 31 + 28 + 31 + 30 = 120
The prices of the two varieties will be equal on 20th May.
Hence, option 3.

2. Let \( f(x) = px^2 + qx + k \), where \( p, q \) and \( k \) are integers, and \( p \neq 0 \)
\[ \therefore f(0) = k = 1 \]
\[ \therefore f(x) = px^2 + qx + 1 \]
\[ f(x) = px^2 + qx + k \]
\[ \therefore f'(x) = 2px + q \]
When \( f'(x) = 0, x = -q/2p \)
\[ f(x) \text{ attains maximum at } x = 1 \]
\[ \therefore q = -2p \]
\[ f(1) = p + q + 1 = 3 \]
\[ \therefore 1 - p = 3 \]
\[ \therefore p = -2 \]
\[ \therefore q = 4 \]
\[ \therefore f(x) = -2x^2 + 4x + 1 \]
\[ \therefore f(10) = -200 + 40 + 1 = -159 \]
Hence, option 2.

3. From the diagram, if they lie outside the circumferences,
\( m \angle AQP' < 60^\circ \)
Also, \( m \angle AQP \) would be 0° if A, Q and P were collinear.
But as the circles with centers P and Q cut each other in two distinct points, A, Q and P cannot be collinear.
\[ \therefore m \angle AQP > 0^\circ \]
\[ \therefore \text{The value, } m \angle AQP \text{ lies between } 0^\circ \text{ and } 60^\circ \]
Hence, option 3.

4. Enemies of every pair are the pairs formed with all numbers other than the two in the member itself.
\[ \therefore \text{If there are } n \text{ elements then each member has} \]
\[ (n-2)C_2 = \frac{(n - 2)(n - 3)(n - 4)!}{2 (n - 4)!} \]
\[ = \frac{1}{2} (n^2 - 5n + 6) \text{ enemies} \]
Hence, option 4.

5. Two members are friends if they have one element in common.
\[ \therefore \text{All the members having one constituent as the} \]
\[ \text{common element are common friends. There are } (n - 3) \text{ such friends.} \]
Also, one pair formed by the uncommon constituents of the two friends is a common friend.
\[ \therefore \text{There are } n - 3 + 1 = n - 2 \text{ common friends.} \]
Hence, option 4.

6. Let Shabnam have Rs. 100 to invest. Let Rs. \( x \), Rs. \( y \) and Rs. \( z \) be invested in option A, B and C respectively.
\[ \therefore x + y + z = 100 \quad \text{(i)} \]
If there is a rise in the stock market, Returns = 0.001\( x \) + 0.05\( y \) − 0.025\( z \)
If there is a fall in the stock market, Returns = 0.001\( x \) − 0.03\( y \) + 0.02\( z \)
Now, \( x \), \( y \) and \( z \) should be such that regardless of whether the market rises or falls, they give the same return, which is the maximum guaranteed return.
\[ \therefore 0.001x + 0.05y - 0.025z = 0.001x - 0.03y + 0.02z \]
\[ \therefore y/z = 9/16 \]
Now, consider different possible values of \( x \), \( y \) and \( z \).
The returns are as follows:

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
<th>( z )</th>
<th>Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>9</td>
<td>16</td>
<td>0.125</td>
</tr>
<tr>
<td>50</td>
<td>18</td>
<td>32</td>
<td>0.15</td>
</tr>
<tr>
<td>25</td>
<td>27</td>
<td>48</td>
<td>0.175</td>
</tr>
<tr>
<td>0</td>
<td>36</td>
<td>64</td>
<td>0.2</td>
</tr>
</tbody>
</table>
We see that as the values of \( y \) and \( z \) increase, the returns increase.
\[ \therefore \] The returns are maximum when \( x = 0\% \), \( y = 36\% \) and \( z = 64\% \) (Note that the values of \( y \) and \( x \) are multiples of 9 and 16.)
The maximum returns are 0.2%.
Hence, option 3.

7. As shown by the table formulated in the first question, maximum returns are guaranteed by investing 36% in option B and 64% in option C.
Hence, option 2.

8. Let the speed of the plane be \( x \) kmph.
Then the speed from B to A is \( (x - 50) \) kmph and that from A to B is \( (x + 50) \) kmph.
Note that the plane travels from B to A, halts for 1 hour and travels back to B, all in 12 hrs.
\[ \therefore \frac{3000}{x - 50} + 1 + \frac{3000}{x + 50} = 12 \]
We can easily see that \( x = 550 \) satisfies the above expression.
Speed of plane = 550 kmph
Now, the plane takes 3000/500 = 6 hrs to travel from B to A.
It reaches A when the time at B is 8:00 am + 6 hrs
= 2:00 p.m.
\[ \therefore \] The time difference between A and B is 1 hour.
Hence, option 4.

9. As calculated in the first question, the cruising speed of the plane is 550 kmph.
Hence, option 2.

10. Let \( aabb \) (\( a \neq 0 \), \( a \) and \( b \) being single digits) be a perfect square.
\[ aabb = 1100a + 11b = 11(100a + b) \]
Also, as \( aabb \) is a perfect square, it is a multiple of 121.
\[ \therefore aabb = 121K \text{ where } K \text{ is also a perfect square.} \]
For \( K = 4 \), \( aabb \) is a 3 digit number, while for \( K > 82 \), \( K \) is a 5 digit number.
For \( 81 \geq K \geq 9, \)
\[ 121 \times 9 = 1089 \]
\[ 121 \times 16 = 1936 \]
\[ 121 \times 25 = 3025 \]
\[ 121 \times 36 = 4356 \]
\[ 121 \times 49 = 5929 \]
\[ 121 \times 64 = 7744 \]
\[ 121 \times 81 = 9801 \]
\[ \therefore \] There is only one number 7744 of the form \( aabb \), which is a perfect square.
Hence, option 5.

11. Each team has \((k - 2)\) players to itself and shares 2 players with other two teams.
\[ n \text{ pairs of teams have 1 player in common and there are } n \text{ teams.} \]
Total number of players = \( n(k - 2) + n \)

12. The cost function \( C(x) = 240 + bx + cx^2 \)
\[ C(20) = 240 + 20b + 400c \]
\[ C(40) = 240 + 40b + 1600c \]
\[ C(60) = 240 + 60b + 3600c \]
By conditions,
\[ 2/3 \times C(20) = C(40) - C(20) \]
\[ \therefore C(40) = 5/3 \times C(20) \]
\[ 240 + 40b + 1600c = 400 + 100b/3 + 2000c/3 \]
\[ 20b/3 + 2800c/3 = 160 \]
\[ 20b + 2800c = 480 \hspace{1cm} \text{-- (i)} \]
Also,
\[ 1/2 \times C(40) = C(60) - C(40) \]
\[ \therefore 3/2 \times C(40) = C(60) \]
\[ 360 + 60b + 2400c = 240 + 60b + 3600c \]
\[ \therefore b = 1/10 \]
\[ \therefore b = 10 \text{ \hspace{0.5cm} [from (i)]} \]
Profit for \( x \) units is \( 30x - C(x) \)
\[ P(x) = 30x - 240 - 10x - x^2/10 \]
\[ = -240 + 20x - x^2/10 \]
The derivative of \( P(x) = P'(x) = 20 - x/5 \)
For maximization of profit \( P(x) = 0 \) and \( P'(x) < 0, \)
\[ P'(x) = -0.2 \]
When \( P'(x) = 0, \)
\[ 20 - x/5 = 0 \]
\[ \therefore x = 100 \]
\[ P'(x) = -0.2 \]
Hence, option 2.

13. Following from the first question, at \( x = 100 \) the profit is maximum.
At that level of production
\[ P(x) = -240 + 20x - x^2/10 \]
\[ P(100) = -240 + 20(100) - (100)^2/10 \]
\[ = -240 + 2000 - 1000 \]
\[ = 760 \]
Hence, option 4.

14. We have the following for different values of \( n \)

<table>
<thead>
<tr>
<th>( n )</th>
<th>( a_n )</th>
<th>( b_n )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>( p )</td>
<td>( q )</td>
</tr>
<tr>
<td>2</td>
<td>( pq )</td>
<td>( q^2 )</td>
</tr>
<tr>
<td>3</td>
<td>( p^2q )</td>
<td>( pq^2 )</td>
</tr>
<tr>
<td>4</td>
<td>( p^2q^2 )</td>
<td>( pq^3 )</td>
</tr>
<tr>
<td>5</td>
<td>( p^3q^3 )</td>
<td>( p^2q^4 )</td>
</tr>
<tr>
<td>6</td>
<td>( p^3q^3 )</td>
<td>( p^2q^4 )</td>
</tr>
<tr>
<td>7</td>
<td>( p^3q^3 )</td>
<td>( p^3q^4 )</td>
</tr>
</tbody>
</table>

\[ \therefore \text{ For even } n \text{ [say, } n = 4], \]
\[ a_n + b_n = p^2q^2 + pq^3 = pq^2(p + q) \]
17. Statement A:

\[x + y + z = 89\]

\[x^2 + y^2 + z^2 \text{ will be minimum when } x = y = z = 89/3\]

But \[89/3\] is a non-integer.

\[\therefore\] We consider integer values of \(x, y, z\) which are as close as possible to \(89/3\).

We get two cases

1. \(x, y, z = 30, 30, 29\)
   \[x^2 + y^2 + z^2 = 2641\]
2. \(x, y, z = 31, 29, 29\)
   \[x^2 + y^2 + z^2 = 2643\]

Minimum possible value of \(x^2 + y^2 + z^2\) is 2641. Thus statement A is sufficient to get the answer. Though statement B states a fact related to the minimum value, it is not necessary to arrive at the minimum value.

Hence, option 3.

18. Let \(p\) be the side of square JKLM.

From statement A,

\[OM = 2 \times OL\]

\(OM\) is maximum when it is the diagonal of the square and has length \(\sqrt{2p}\)

When \(OM\) is maximum, \(OM = \sqrt{2} \times OL\)

\[\therefore\] OM \(\neq 2 \times OL\) if O lies on JK.

\[\therefore\] Rahim is unable to draw the square.

Statement B offers no additional or relevant information.

Hence, option 1.

19. Let the inner radius be \(r\) meter.

Capacity of tank = \((1 \text{ m}^3 = 1 \text{ kilolitre})\)

From statement A, since \(r \geq 4\ m\)

\[\therefore\] Capacity of tank > 256 \text{ m}^3

Since the capacity needed is more than 256 \text{ m}^3 statement A is insufficient.

From statement B,

Volume of the material of tank = mass/density = \(300000kg/(3 \text{ gm/cc}) = 10,000,000 \text{ cm}^3 = 10 \text{ m}^3\)

Hence the inner volume of tank =

Outer volume = Volume of material of tank

Therefore, we can say that the tank capacity is adequate.

Hence, option 2.

20. The bill can be paid in 18 ways as shown in the given table.

<table>
<thead>
<tr>
<th>50 Misos</th>
<th>10 Misos</th>
<th>1 Miso</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>107</td>
<td>107</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>97</td>
<td>107</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>87</td>
<td>107</td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td>77</td>
<td>107</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
<td>67</td>
<td>107</td>
</tr>
<tr>
<td>0</td>
<td>5</td>
<td>57</td>
<td>107</td>
</tr>
<tr>
<td>0</td>
<td>6</td>
<td>47</td>
<td>107</td>
</tr>
<tr>
<td>0</td>
<td>7</td>
<td>37</td>
<td>107</td>
</tr>
<tr>
<td>0</td>
<td>8</td>
<td>27</td>
<td>107</td>
</tr>
<tr>
<td>0</td>
<td>9</td>
<td>17</td>
<td>107</td>
</tr>
<tr>
<td>0</td>
<td>10</td>
<td>7</td>
<td>107</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>57</td>
<td>107</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>47</td>
<td>107</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>37</td>
<td>107</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>27</td>
<td>107</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>17</td>
<td>107</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>7</td>
<td>107</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>7</td>
<td>107</td>
</tr>
</tbody>
</table>

Hence, option 3.
21. \( \frac{1}{m} + \frac{4}{n} = \frac{1}{12} \)
\[ \therefore \frac{1}{m} = \frac{1}{12} - \frac{4}{n} \]
\[ \therefore m = 12n - (n - 48) \]
As, \( m \) is a positive integer, \( n \) should be greater than 48 and moreover since \( n \) is a positive odd integer lesser than 60, \( n \) can take values 49, 51, 53, 55, 57 and 59.
If \( n = 49, 51, 57 \) then \( m \) is a positive integer.
If \( n = 53, 55, 59 \) then \( m \) is not an integer.
\[ \therefore \text{3 pairs of values of } m \text{ and } n \text{ satisfy the given equation}. \]
Hence, option 5.

22. Let the amount on Shailaja’s cheque be Rs. \( x \) and paise \( y = (100x + y) \) paise (\( x \) and \( y \) are positive integers).
The teller gives her \((100y + x)\) paise.
Now, \( 100y + x = 50 = 3(100x + y) \)
\[ \therefore 97y = 299x = 50 \]
\[ \therefore y = \frac{(50 + 299k)}{97} = \frac{(50 + 8x + 291x)}{97} \]
\[ = \{(50 + 8x)/97\} + 3 \]
Now as \( y \) is an integer, \((50 + 8x)\) has to be a multiple of 97 with \( x, y \leq 99 \)
50 + 8x = 97 \( k \) (\( k \) is an integer)
\[ \therefore x = \frac{12k - 6 + [(k - 2)/8]}{9} \]
\[ \therefore x = 2, 10, 18... \]
\[ \therefore x = 18, 115, 212 \]
\[ \therefore x = 18 \] is the only possible value.
This implies that \( y = 5 \)
\[ \therefore \text{The amount on Shailaja’s cheque is over Rs. 18 but less than Rs. 19}. \]
Hence, option 4.

23. \[ y = \frac{(2 + 4 + 6 + 8 + ... + 2n)n}{n} \]
\[ X = \frac{(3 + 5 + 7 + 9 + ... + (2n + 1))n}{n} \]
\[ = \{(2 + 1) + (4 + 1) + (6 + 1) + (8 + 1) + ... + (2n + 1)\}/n \]
\[ = \{(2 + 4 + 6 + 8 + ... + 2n) + (1 + 1 + 1 + 1 + ... n \text{ times})\}/n \]
\[ = Y + 1 \]
\[ \therefore X = Y + 1 \]
Hence, option 2.

Note: The information that ‘\( n \) is a positive integer larger than 2007’ does not affect the answer in any way.

24. The sum of the ages of the members of the family ten years ago = 231
\[ \therefore \text{The sum of the ages of the members of the family seven years ago} = 231 + (3 \times 8) - 60 = 195 \]
\[ \therefore \text{The sum of the ages of the members of the family four years ago} = 195 + (3 \times 8) - 60 = 159 \]
\[ \therefore \text{The sum of the ages of the members of the family now} = 159 + (4 \times 8) = 191 \]
\[ \therefore \text{Required average} \approx \frac{191}{8} = 23.875 \approx 24 \]
Hence, option 5.

25. \[ f(1) + f(2) + f(3) + ... + f(n - 1) + f(n) \]
\[ = n^2 f(n) \] ... (i)
Similarly,
\[ f(1) + f(2) + f(3) + ... + f(n - 1) \]
\[ = (n - 1)^2 f(n - 1) \] ... (ii)
\[ \therefore f(n) = n^2 f(n) - (n - 1)^2 f(n - 1) \] ... (i) - (ii)
\[ \therefore (n^2 - 1) f(n) = (n - 1)^2 f(n - 1) \]
\[ \therefore f(n) = [(n - 1) f(n - 1)]/(n + 1) \]
\[ \therefore f(9) = \frac{8}{10 \times 7/9} \times \frac{6/8 \times 5/7 \times 4/6 \times 3/5 \times 2/4 \times 1/3 \times 3600}{(10 \times 9)(10)} = \frac{2 \times 3600}{10} = 80 \]
Hence, option 1.

26. From Statement A, the MM club scored 4 goals in the second half. The number of goals scored by the opponent is not known. So the winner cannot be determined. Statement A is insufficient.
From Statement B, the opponent scored 4 goals in the match, but we do not know the number of goals that the MM club scored. Statement B is insufficient.
Considering both the statements we have following.

<table>
<thead>
<tr>
<th>First Half</th>
<th>Second Half</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM Club</td>
<td>Opponent</td>
<td>MM Club</td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Thus, MM club could have won the match or could have tied it. The question cannot be answered.
Hence, option 5.

27. From Statement A, 40% of the top academic performers were athletes.
\[ \therefore \text{If there are } x \text{ top academic performers,} \]
\[ \therefore x = 25 \]
Statement A is sufficient.
Statement B does not give any useful information.
Hence, option 1.

28. Chetan’s rank = 4 or 5
Now, Bala < Chetan and Dev < Ernesto.
From Statement A,

<table>
<thead>
<tr>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bala</td>
<td>Dev</td>
</tr>
<tr>
<td>2</td>
<td>Dev</td>
<td>Ernesto</td>
</tr>
<tr>
<td>3</td>
<td>Ernesto</td>
<td>Bala</td>
</tr>
<tr>
<td>4</td>
<td>Chetan</td>
<td>Chetan</td>
</tr>
<tr>
<td>5</td>
<td>Atul</td>
<td>Atul</td>
</tr>
</tbody>
</table>

The highest rank holder cannot be determined. Statement A is insufficient. Statement B is also insufficient.
Considering both statements together (refer to the table), Case 2 holds. Dev got the highest rank.
Hence, option 4.
29. Let there be 100x employees. So, 30x are male and 70x are female.
   ∴ 7x female employees have an engineering background.
   From statement A, 25x employees have an engineering background.
   ∴ 18x male employees have an engineering background.
   Required percentage = 18x × 100 / 30x
   Statement A is sufficient.
   From Statement B, Number of male employees having an engineering background = 1.2 × 7x
   Required percentage = 1.2 × 7x × 100/30x
   Hence, option 3.

30. From the table given in the question,
   Total students = 800
   Students in Secondary = 0.8 × 800 = 640
   Students in Class 11 = (800 – 640)/2 = 80
   Students in Class 12 = 80
   Males in Class 11 = 0.55 × 80 = 44
   Males in Class 12 = 0.6 × 80 = 48
   ∴ Males in Secondary = 0.475 × 800 – 44 = 48 = 288
   Vegetarians in Class 11 = 0.5 × 80 = 40
   Vegetarians in Secondary = 0.55 × 640 = 352
   Vegetarians in Class 12 = 800 × 0.53 – 40 = 352 = 32
   ∴ The percentage of vegetarians in class 12
   = 32 × 100/80 = 40%
   Hence, option 1.

31. Vegetarian Males in Class 12 = 0.25 × 32 = 8
   ∴ Non-vegetarian Males in class 12 = 48 – 8 = 40
   ∴ Vegetarian females in class 12
   = Vegetarians in class 12 – Male vegetarians in class 12
   = 32 – 8 = 24 (We derived the number of vegetarians in the class in the previous question)
   ∴ Required difference = 40 – 24 = 16
   Hence, option 5.

32. In the first question, we derived the number of males in class secondary section as 288 and the total number of students in the section as 640.
   ∴ Percentage of male students in secondary section
   = 288 × 100/640 = 45%
   Hence, option 2.

33. (This question was not considered for evaluation as there was an error in the question)
   “50% of the students are vegetarian males” contradicts the data given initially.
   Interpreting it as “50% of the males are vegetarian”, we have the following:
   In secondary,
   Vegetarian males = 144
   Non-vegetarian males = 144
   Vegetarian females = 352 – 144 = 208
   Non-vegetarian females = 352 – 208 = 144
   ∴ Except vegetarian females, all other groups have same number of students.
   Hence, option 3.

34. Observing the values through the years, we can say that Material, Labour and Operating costs directly vary with the change in volume of production.
   The other costs are almost constant.
   If the production is x units, the variable cost for material, labour and operation is 50x, 20x and 30x respectively.
   ∴ Total variable cost = 100x
   Total fixed cost (using information for 2006)
   = 1400 + 1200 + 400 + 800 + 5800 = 9600
   ∴ Total cost of producing x units = 100x + 9600
   Now, x = 1400
   Cost per unit = (1400 × 100 + 9600)/1400 = 106.85
   Hence, option 2.

35. From the explanation given in the first question, to avoid any loss, 100x + 9600 ≤ 125x
   ∴ x ≥ 384
   Hence, option 3.

36. Profit for 1400 units = 1400 × 125 – (1400 × 100 + 9600) = 25400
   Profit for (1400 + m) units = (1400 + m) × 120 – ((1400 + m) × 100 + 9600) = 18400 + 20m
   Maximum value of m = 300
   Maximum profit for 1400 + 300 units = 24400
   ∴ Maximum profit that the company can earn is 25400.
   Hence, option 1.

37. The new reduced price = 0.95 × 125 = 118.75
   Profit = 118.75x – 100x – 9600 = 18.75x – 9600
   Profit will be the maximum when 18.75x is the maximum. As the maximum production capacity is 2000 units, profit is the maximum when 2000 units are produced.
   Hence, option 5.
38. Cost of spinal fusion in India = Rs. 5500 × 40.928
   Cost with the increased value of Rupee = 5500 × 40.928/35 = 6431 USD
   Cost of Spinal Fusion in Singapore = 9000 USD
   Required difference = 9000 – 6431 = 2569 USD
   Hence, option 2.

39. Cost of Hysterectomy in Thailand = 4500 + 6000 = 10500 USD
   Cost of Hysterectomy in India = 3000 + 5000 = 8000 USD
   Travelling cost = 15000 Bahts = 15000/32.89 USD = 456 USD
   Required difference = 10500 – 8456 = 2044 USD = 2044 × 32.89 = 67227 Bahts
   Hence, option 4.

40. As shown in the table, Malaysia will have the cheapest package.

<table>
<thead>
<tr>
<th></th>
<th>India</th>
<th>Thailand</th>
<th>Singapore</th>
<th>Malaysia</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angioplasty</td>
<td>16000</td>
<td>18000</td>
<td>17000</td>
<td>17000</td>
<td>5700</td>
</tr>
<tr>
<td>Hip Replacement</td>
<td>16000</td>
<td>17000</td>
<td>17000</td>
<td>18000</td>
<td>4300</td>
</tr>
<tr>
<td>Knee Replacement</td>
<td>17500</td>
<td>16000</td>
<td>17000</td>
<td>12000</td>
<td>4000</td>
</tr>
<tr>
<td>Total</td>
<td>49500</td>
<td>51000</td>
<td>51000</td>
<td>47000</td>
<td>14000</td>
</tr>
</tbody>
</table>

Hence, option 3.

41. Referring to the table formulated in the first question, India will be the most expensive for knee replacement.
   Hence, option 1.

42. Possible routes from A to J are as shown in the table below.

<table>
<thead>
<tr>
<th>Route</th>
<th>Distance</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABJ</td>
<td>2860</td>
<td>2945</td>
</tr>
<tr>
<td>ADJ</td>
<td>2500</td>
<td>3700</td>
</tr>
<tr>
<td>AFJ</td>
<td>2315</td>
<td>2850</td>
</tr>
<tr>
<td>AGJ</td>
<td>2180</td>
<td>3340</td>
</tr>
<tr>
<td>AHJ</td>
<td>2350</td>
<td>2275</td>
</tr>
<tr>
<td>ABHJ</td>
<td>2710</td>
<td>2995</td>
</tr>
<tr>
<td>ABIJ</td>
<td>3120</td>
<td>3660</td>
</tr>
<tr>
<td>ACDJ</td>
<td>2900</td>
<td>4250</td>
</tr>
<tr>
<td>ACFJ</td>
<td>2170</td>
<td>2930</td>
</tr>
<tr>
<td>ACGJ</td>
<td>2530</td>
<td>3340</td>
</tr>
<tr>
<td>ADFJ</td>
<td>2445</td>
<td>3100</td>
</tr>
<tr>
<td>ADGJ</td>
<td>2320</td>
<td>2890</td>
</tr>
<tr>
<td>ADHJ</td>
<td>2200</td>
<td>2925</td>
</tr>
<tr>
<td>AEFJ</td>
<td>3465</td>
<td>4450</td>
</tr>
<tr>
<td>AEGJ</td>
<td>3045</td>
<td>3640</td>
</tr>
<tr>
<td>AEHJ</td>
<td>2495</td>
<td>2900</td>
</tr>
<tr>
<td>AFGJ</td>
<td>3075</td>
<td>3640</td>
</tr>
<tr>
<td>AFIJ</td>
<td>2680</td>
<td>3190</td>
</tr>
<tr>
<td>AGIJ</td>
<td>2320</td>
<td>3540</td>
</tr>
<tr>
<td>AHJ</td>
<td>3200</td>
<td>3360</td>
</tr>
</tbody>
</table>

The shortest distance is by the route A-C-F-J. The price is 1350 + 430 + 1150 = Rs. 2930
Hence, option 4.
43. The current market price paid by the customers is Rs.2275 (A-H-J).
Therefore, the company should charge
(2275 × 0.95) = Rs. 2161.25
Hence, option 2.

44. If C, D and H are closed, the cheapest route will be A-F-J and it will cost Rs. 2850.
Hence, option 3.

45. The minimum cost per km that the company incurs would correspond to the minimum price per km route.
By observation from the table, minimum price per kilometre is for the route AHJ and is equal to
2275/2350 = 0.97
Minimum cost per kilometre = 0.97/1.1 = 0.88
Hence, option 2.

46. Even if the margin for the prices changes the minimum cost per km would correspond to the same route namely A-H-J.
∴ From the table, the distance for the travel = 2350 km
Hence, option 4.

47. |       | Carbohydrate | Protein | Fat | Minerals |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>O &amp; P</td>
<td>65</td>
<td>25</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>R &amp; S</td>
<td>25</td>
<td>50</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>P &amp; S</td>
<td>62.5</td>
<td>35</td>
<td>0</td>
<td>2.5</td>
</tr>
<tr>
<td>Q &amp; R</td>
<td>7.5</td>
<td>40</td>
<td>45</td>
<td>7.5</td>
</tr>
<tr>
<td>O &amp; S</td>
<td>47.5</td>
<td>40</td>
<td>5</td>
<td>7.5</td>
</tr>
</tbody>
</table>

A mixture of O and S in equal proportion satisfies the given constraints as can be seen from the table above.
Hence, option 5.

48. The diet should contain 10% minerals. P contains no minerals.
∴ P cannot be a part of any mixture.
R and S both contain 5% minerals.
∴ Mix of R and S in any proportion cannot give 10% minerals.
Consider O and R in the proportion x:y
∴ 10x + 5y = 10(x + y)
∴ 5y = 10y, which is not possible.
Similarly, Q and S, O and S, and Q and R are not possible.
Similarly a mix of three ingredients is not possible.
∴ The only possible mix is that of O and Q in equal proportion.
Hence, option 1.

49. Consider the options.
Option 1: P and Q have to be mixed in the proportion 4:1 to achieve 10% fat content. But this does not give 30% protein.
Option 2: P and S do not contain fat.
Option 3: P and R should be mixed in the proportion 3:1 to achieve 10% fat content. But 30% protein content is not achieved.
Option 4: Q and S should be mixed in the proportion 1:4 to achieve 10% fat content and 46% protein content. The cost of this mix per unit would be 6/5.
Option 5: R and S should be mixed in the proportion 1:3 to achieve 10% fat content and 50% protein content. The cost per unit of this mix would be 2.
Therefore, lowest cost is for Q and S.
Hence, option 4.

50. P, Q and S contain 80%, 10% and 45% carbohydrates.
To achieve 60% carbohydrates, proportion of P should be the maximum. Hence, options 1 and 3 are eliminated.
Option 2: Carbohydrate content = (320 + 10 + 90)/700
= 420/700 = 60%
Cost per unit = (200 + 200 + 200)/700 = 6/7 = 0.857
Option 4: Carbohydrate content = (240 + 10 + 90)/60
< 60%
Option 5: Carbohydrate content = (320 + 10 + 45)/600
= 62.5%
Cost per unit = (200 + 200 + 100)/600 = 5/6 = 0.833
P, Q and S in the proportion 4 : 1 : 1 has the lowest cost per unit.
Hence, option 5.

51. The first sentence is the easiest to decide. Since the ‘cricket council’ is singular, singular verbs (was and is) are required. Hence, the answer choice should begin with A. This eliminates options 1, 3, and 5.
Comparing options 2 and 4, the difference is in the third choice- censored versus censured. Credulous means ready to believe easily and credible means offering reasonable grounds for being believed. Hence, Amit’s explanation is credible – B. Sequence ABAB is option 4. Other confusable options: censor(verb): to examine in order to delete anything that is objectionable. Censure(verb): criticize; is the correct word. Discrete: distinct; discreet: modest, unnoticeable.
Hence, the correct answer is option 4.

52. Further is temporal and farther is spatial. The choice of A in the first sentence eliminates options 1, 3 and 5.
Comparing options 2 and 5 (ABBBAA versus ABABA), one can see that the third sentence is decisive. Dissconsume: mistrust and mistrust eliminates mistrust. Hence distrust is the correct use in the context.
Hence, the correct answer is option 5.

53. In this set, the last two sentences are the easiest to decide: stationary truck and to rise above are correct
uses. The answer choice has to end with AB. Options 1 and 3 are eliminated. Beside oneself with rage is the correct idiom. Hence, the correct answer is B. Sensuous implies gratification of the senses for the sake of aesthetic pleasure- the sensuous delights of great music. Sensual tends to imply the gratification of the senses or the indulgence of the physical appetites as ends in themselves - a life devoted to sensual pleasures. Poetry is sensuous rather than sensual. Hence, the correct answer is B. When we decline something we do it regretfully, when someone else has declined we find it regrettable. Hence, the correct answer is B. Hence, the correct answer is option 2.

54. Option 1 is factually correct and answers the question "how" rather than "what". Options 2, 3 and 5 are partial in answering the question what the author is trying to illustrate. Option 4 is supported by the following: "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." (at the beginning of the passage) and "Normal science can be determined in part by the direct inspection of paradigms, ... formulation of rules and assumption." (Towards the end of the passage). This, then is the purpose of the passage. Hence, the correct answer is option 4.

55. The meaning given in option 3 to 'loci of commitment' is explicitly stated in the passage. The passage says: the historian tries to isolate the 'particular loci of commitment' at a given time and then explains what he is trying to find out and concludes by saying 'these are the community's paradigms'. Thus, loci of commitment are the same as the paradigms. None of the other options are worth evaluating because they are further in the passage and not related to the question. Hence, the correct answer is option 3.

56. Option 5 is a mere definition of the term 'paradigm' as used in the passage. Paradigm in the context means a set of broad guidelines accepted by a group of researchers. They are not as rigid as rules. They are not very concrete and differ from community to community. Option 1 is easily eliminated because of "entirely define" which is too drastic. Option 2 is eliminated because of 'would benefit' – nothing in the passage even implicitly supports this. Option 3 is contrary to the passage in the part referring to Newton, Lavoisier, Maxwell, and Einstein. Option 4 - 'the choice of isolation mechanism' is not discussed in the passage, nor is it even indirectly referred to. Hence, the correct answer is option 5.

57. The paragraph briefly is about why stories are structured around focal characters. (And why in stories of organizations, organizations have to be personified and focal characters as organizations cannot narrate their experiences. Option 5 concludes this chain of thoughts by saying that this kind of personification is a textual device resorted to bring coherence. Option 1 is incorrect as it continues the first part of the paragraph and is unrelated the second part. Option 2 is incorrect as it talks about abstracting away from the particular whereas the paragraph is talking about particularizing. Options 3 and 4 talk about different points of view, which is irrelevant to the paragraph. Hence, the correct answer is option 5.

58. 'Nevertheless at the beginning of the paragraph, and "yet" at the beginning of option 1 make the paragraph logically complete. Option 1 is the reason why the paragraph is written - to communicate that 'photographs are still powerful'. The traveller in option 2, the beloved and the dead in option 3, falsehood and trickery in option 4, and the invention and means of living in option 5 do not help conclude the paragraph. Hence, the correct answer is option 1.

59. The paragraph mentions the tangible parts of the inventory that Mma Ramotswe had at the agency, and 'human intuition and intelligence', option 2 concludes the paragraph by stating that 'no inventory would ever be able to include those. Options 3, 4 and 5 are eliminated in comparison to options 1 and 2 which continue the idea of the inventory. Option 1, though continuing the idea of inventory is far inferior to option 2. The 'those' in option 2 scores over option 1. Hence, the correct answer is option 2.

60. The answer is supported by the paragraph beginning "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 ... as well as societies on hundreds of smaller islands and regional societies within each of the continents." Options 1 and 3 say the same thing. Option 1 is eliminated because the 'difference' mentioned in option 1 is explained in option 3. Hence, option 3 scores over option 1.
Option 4 is eliminated because ‘the good comparison to large islands’ is inconsequential to the student of history. The student is more interested in knowing how endowments and size affect societies- as a natural experiment.

Option 5 is eliminated because the paragraph says nothing about arousing ‘curiosity about how humans evolved’ as stated in the option.

Hence, the correct answer is **option 3**.

61. This is directly stated in the passage. “Prediction in history, as in other historical sciences, is most feasible on large spatial scale and over long times, when the future of millions of small scale brief events become averaged out.” The answer option is merely the same thing expressed in different (even easier) words.

Option 1 is eliminated because of “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”- in other words the explanations are broad because prediction is not possible and not the other way round.

In option 3 ‘not interested’ is first data inadequate (passage does not say not interested) and by implication incorrect, because history is interested “in a multitude of minor factors,” – in order that the average may be worked out over long periods of time.

Option 4 is factually correct but does not answer the question- why prediction is difficult.

Option 5 is also factually correct but does not explain why prediction is difficult- it merely explains the constraints that history faces and how then it operates.

Hence, the correct answer is **option 2**.

62. The answer is directly supported by “The student of human history can draw on many more natural experiments than ... the five inhabited continents. Comparisons can also utilize large islands .... as well as societies on hundreds of smaller islands and regional societies within each of the continents”. The implication is expressed in option 3.

Option 1 is false in “not conducting...” – this is not true in the context of the passage, nor is the author implying it.

Option 2 is false– the passage nowhere says that large islands provide ‘great’ opportunities for natural experiments”– they are one of the opportunities among many.

The problem faced by historians is not ‘unique’ as stated in option 4. The passage explicitly states that it is faced by several other studies mentioned in the first sentence itself.

There is no data in the passage (even by implication) about cultural anthropologists. Hence, option 5 too is eliminated.

Hence, the correct answer is **option 3**.

63. Statement A is incorrect because of the phrase, ‘returned to home’. The correct usage is ‘returned home’.

Statement B is incorrect because the idiom is ‘get one’s hands on’ and not ‘hand on’.

Statement C is correct.

Statement D is incorrect because there should be a hyphen or a comma after a Shaliach (a Shaliach – a sort of recruiter to Minneapolis). “A sort of” though rather informal, is correct usage.

Statement E is correct.

Hence, the correct answer is **option 1**.

64. Statement A is incorrect – The use of the word, ‘so’ is redundant and inappropriate. (So and once, in the context are adverbs – one of them is enough).

Statement B is correct.

Statement C is incorrect because the use of ‘assuming hypothetically’ makes it redundant. One can either assume or hypothesize, but ‘assuming hypothetically’ is meaningless.

Statement D is incorrect in the plural use of ‘stimuli’ instead of ‘stimulus’ with the article ‘a’.

Statement E should have been ‘effect’ instead of ‘affect’.

Hence, the correct answer is **option 5**.

65. Statement A is incorrect because the verb ‘told’ is incorrectly used. The verb ‘said’ should be used instead.

There is no error in statement B.

Statement C contains the incorrect idiom ‘handed to us’ instead of ‘handed down to us’.

Statement D is correct.

Statement E is incorrect because the word, ‘hence’ is used as a conjunction, whereas it is an adverb. The use of a proper conjunction (e.g. and / but) will improve the sentence.

Hence, the correct answer is **option 3**.

66. The theme of the passage is that biological linkages (for example mother-child; father-child) do not structure human society. We expect a biological mother to display certain characteristics in her ‘role’ as a mother as an ideal. The passage is then an explanation of how human society is structured on the basis of such definitions of roles considered as ideals. Only option 5 captures this briefly.

Option 1 talks about ‘absence of strong biological linkages’ which is not dealt with in the passage.

Option 2 is contrary to the theme of the passage.

Option 3 which states “... behaviour is independent of ... reciprocal roles” is contrary to the passage.
Option 4 may be evaluated as the answer, but passage does not state that human behaviour is dependent on biological linkages, and the example of the step mother disproves this option. Only option 5 captures the theme of the passage. Hence, the correct answer is **option 5**.

67. "There is a 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 plays his part 'tongue in cheek' (insincerely). The father's self is denied by his identification with his biological relationship. If this does not happen, if a father behaves in a tongue in cheek manner, we are offended. If biological relations structured human society, it is enough to be a biological father to be accepted by society. His behaviour (and with it, the reciprocal relationship) then becomes unimportant.

All the other options support the fact that 'reciprocal relationship' structure human society.

Hence, the correct answer is **option 2**.

68. The answer comes from the last paragraph where three examples are given, the father, the waitress, and the priest.

The example of the priest makes statement A correct. (There is so much expectation from the society that the priest's true self is not revealed at all.)

The father's example makes statement B correct. (The father's self gets aligned with his biological relationship and the self is denied.)

Statement C is incorrect in that the passage does not discuss the development of skill as a reason for the denial of the self.

Hence, the correct answer is **option 4**.

69. When the four statements are studied well, it is very easy to establish that EC and BD are mandatory pairs. Only statements E and C contain the idea of 'crime'. Hence one cannot place any other statement along with statement E, but statement C.

In the same way, statements B and D both have reference to written 'piece of work', making BD in that order mandatory. Once this is noticed, placing EC and BD in that order with the help of A (fixed) is easy.

Hence, the correct answer is **option 4**.

70. The "two discernible" or "official discourses" makes it compulsory to place statement E after statement A, because statement E talks about "a third unofficial discourse". (In other words if not placed next to statement A, statement E cannot be placed anywhere else). AE is the first mandatory pair.

'These frameworks' in statement D is explained in statement E so that statement D unless placed next to statement E, will not make sense. (In other words ED too is mandatory.) The idea of motherhood from statement D (biological tie) is continued in statement B. Thus the links in EDB are most obvious.

Statements C and B too are clearly linked because statement B ends with reference to 'dominant discourse' and statement C begins with 'historical work' making EDBC most logical sequence.

Hence, the correct answer is **option 1**.

71. As per the options comparing statements B, C and D as the sentences to follow statement A, statement C gets eliminated. Statements B and D are far better sentences to follow statement A than statement C. The next decisive point is the 'such developments' in statement D. As statements A, B, and C are talking about several developments, statement D is best placed at the end of it all, and will mar the structure of the paragraph if placed anywhere in between.

The choice then becomes very clear. Also, the link between statement D and statement E with their 'some analysts' (statement D) and 'different analysts' (statement E) is also obvious.

Hence, the correct answer is **option 5**.

72. Either by looking at the options or by reading the sentences in the given order, one can easily see that statement A has to be followed either by statement B or by statement C because they mention the 'squatters' introduced in statement A. (This eliminates options 4 and 5).

A more careful reading of statement B and statement C establishes that since statement C explains the identity of the squatters and statement B mentions their farming, statement B has to follow statement C rather than precede it.

At his stage one has to evaluate/compare only options 1 and 3. Considering statement E and statement D to follow statement B, the link between statement B and statement E because of the "maize" conclusively makes option 3 the answer.

Hence, the correct answer is **option 3**.

73. The lines, "... the art 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..." tell us that the works of art do not differ in their 'width' and 'depth' (as mentioned in option 4) 'life' and its 'interpretation' (as mentioned in option 3), but are merely different interpretations of the 'old' experience as one painting of Madonna (Virgin Mary, the mother of Jesus) differs from another
version. This eliminates options 3 and 4.
The consequence of artistic license is not discussed in
the passage so this eliminates option 1.
Option 5 is ridiculous because the Madonna here does
not refer to the modern day singer.
Hence, the correct answer is option 2.

74. Rilke’s conclusion is repeated almost verbatim in
option 1. “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.” These are
the concluding words of Rilke from the passage after
the example of the ‘sea’ and ‘the other creation’
mentioned in the question.
Option 2 is mundane and quotes the example itself and
not its purpose.
Option 3 is abstract, and an ‘aimlessness’ cannot be
attributed either to the oarsmen or the singer.
Option 4 in ‘understanding the elements’ is not the
purpose of either the oarsmen or the singer.
Option 5 is vague; the passage does not explain either
natural experience or real waves.
Hence, the correct answer is option 1.

75. “Adventurers of experience set out as though in
lifeboats to rescue and bring back to the shore treasures
of knowing and feeling which the old order had left
floating on the high seas. The work 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.” Renaissance artists
are cited as examples of ‘adventurers of experience’.
These italicized words make option 4 right.
As a result, option 3 is eliminated as being merely an
example.
Driven by courage (option1), create their own genre
(option 2) are partial and not the intended meaning of
the writer. This eliminates options 1 and 2.
Option 5 is also related to the example in a literal way,
whereas the writer is being symbolic in calling the
artists adventurers. This eliminates option 5.
Hence, the correct answer is option 4.