1. Immediately fill in the particulars on this page of the Test Booklet with Black Ball Point Pen provided in the examination hall.
2. This Test Booklet consists of three parts - Part I, Part II and Part III. Part I has 30 objective type questions of Mathematics consisting of FOUR (4) marks for each correct response. Part II Aptitude Test has 50 objective type questions consisting of FOUR (4) marks for each correct response. Mark your answers for these questions in the appropriate space against the number corresponding to the question in the Answer Sheet placed inside this Test Booklet. Use the Black Ball Point Pen provided in the examination hall for writing particulars/marking responses on Side-1 and Side-2 of the Answer Sheet. Part III consists of 2 questions carrying 70 marks which are to be attempted on a separate Drawing Sheet which is also placed inside the Test Booklet. Marks allotted to each question are written against each question. Use colour pencils or crayons only on the Drawing Sheet. Do not use water colours. For each incorrect response in Part I and Part II, 1/4 (one-fourth) marks of the total marks allotted to the question (i.e. 1 mark) would be deducted from the total score. No deduction from the total score, however, will be made if no response is indicated for an item in the Answer Sheet.
3. There is only one correct response for each question in Part I and Part II. Filling up more than one response in each question will be treated as wrong response and marks for wrong response will be deducted accordingly as per instruction 2 above.
4. The test is of 3 hours duration. The maximum marks are 390.
5. On completion of the test, the candidates must hand over the Answer Sheet of Mathematics and Aptitude Test-Part I & II and the Drawing Sheet of Aptitude Test-Part III along with Test Booklet for Part III to the invigilator in the Room/Hall. Candidates are allowed to take away with them the Test Sheet and Drawing Sheet to be retained by the candidate.
6. The CODE for this Booklet is W. Make sure that the CODE printed on Side-2 of the Answer Sheet and on the Drawing Sheet (Part III) is the same as that on this booklet. Also tally the Serial Number of the Test Booklet, Answer Sheet and Drawing Sheet and ensure that they are same. In case of discrepancy in Code or Serial Number, the candidate should immediately report the matter to the Invigilator for replacement of the Test Booklet, Answer Sheet and the Drawing Sheet.
7. Do not fold or make any stray mark on the Answer Sheet.

---

**Name of the Candidate (in Capitals):**

**Roll Number:** in figures

**Examination Centre Number:**

---

**Centre of Examination (in Capitals):**

---

**Candidate’s Signature:**

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**Invigilator’s Signature (1):**

---

**Invigilator’s Signature (2):**
1. If \( A \) and \( B \) be two finite sets such that the total number of subsets of \( A \) is 960 more than the total number of subsets of \( B \), then \( n(A) - n(B) \) (where \( n(X) \) denotes the number of elements in set \( X \)) is equal to:
   (1) 2
   (2) 3
   (3) 4
   (4) 6

2. If \( \lambda_1 \) and \( \lambda_2 \) are the two values of \( \lambda \) such that the roots \( \alpha \) and \( \beta \) of the quadratic equation, \( \lambda(x^2 - x) + x + 5 = 0 \) satisfy \( \frac{\alpha}{\beta} + \frac{\beta}{\alpha} + \frac{4}{5} = 0 \), then \( \frac{\lambda_1}{\lambda_2^2} + \frac{\lambda_2}{\lambda_1^2} \) is equal to:
   (1) 536
   (2) 512
   (3) 504
   (4) 488

3. If \( (x + iy)^2 = 7 + 24i \), then a value of \( \left(7 + \sqrt{-576}\right)^{\frac{1}{2}} - \left(7 - \sqrt{-576}\right)^{\frac{1}{2}} \) is:
   (1) \(-3i\)
   (2) \(2i\)
   (3) 6
   (4) \(-6i\)
4. Let \( S \) be the set of all real values of \( 'a' \) for which the following system of linear equations

\[
\begin{align*}
ax + 2y + 5z &= 1 \\
2x + y + 3z &= 1 \\
3y + 7z &= 1
\end{align*}
\]

is consistent. Then the set \( S \) is:

(1) equal to \( \mathbb{R} \)
(2) equal to \( \mathbb{R} - \{1\} \)
(3) equal to \( \{1\} \)
(4) an empty set

5. For all real numbers \( x, y, \) and \( z \), the determinant

\[
\begin{vmatrix}
2x & xy - xz & y \\
x + z + 1 & xy - xz + yz - z^2 & 1 + y \\
3x + 1 & 2xy - 2xz & 1 + y
\end{vmatrix}
\]

is equal to:

(1) zero
(2) \( (x - y) (y - z) (z - x) \)
(3) \( (x - yz) (y - z) \)
(4) \( (y - xz) (z - x) \)

6. An urn contains 5 red, 4 black and 3 white marbles. Then the number of ways in which 4 marbles can be drawn from it so that at most 3 of them are red, is:

(1) 455
(2) 460
(3) 490
(4) 495

4. \( \text{माना} S, 'a' \text{ के सभी वास्तविक मानों का समुच्चय है जिसके लिए, रेखायुक्त समीकरण निकाय} \)

\[
\begin{align*}
ax + 2y + 5z &= 1 \\
2x + y + 3z &= 1 \\
3y + 7z &= 1
\end{align*}
\]

संगत (consistent) हैं, तो समुच्चय \( S \) :

(1) \( \mathbb{R} \) के बराबर है
(2) \( \mathbb{R} - \{1\} \) के बराबर है
(3) \( \{1\} \) के बराबर है
(4) एक रिक्त समुच्चय है

5. \( x, y \) तथा \( z \) के सभी वास्तविक संख्याओं के लिए, सारणिक

\[
\begin{vmatrix}
2x & xy - xz & y \\
x + z + 1 & xy - xz + yz - z^2 & 1 + y \\
3x + 1 & 2xy - 2xz & 1 + y
\end{vmatrix}
\]

वरार यह :

(1) शून्य (0)
(2) \( (x - y) (y - z) (z - x) \)
(3) \( (x - yz) (y - z) \)
(4) \( (y - xz) (z - x) \)

6. \( \text{एक कलश में 5 लाल, 4 ब्लैक तथा 3 सफेद कंचे हैं।} \)
\( \text{तो उन तरीकों, जिनमें कलश में से 4 कंचे निकाले जा सकते हैं कि उनमें से अधिक से अधिक 3 लाल हो,} \)
\( \text{की संख्या है :} \)

(1) 455
(2) 460
(3) 490
(4) 495
7. If the digits at ten’s and hundred’s places in $(11)^{2016}$ are $x$ and $y$ respectively, then the ordered pair $(x, y)$ is equal to:

(1) (1, 6)
(2) (6, 1)
(3) (8, 1)
(4) (1, 8)

8. Let $a_1, a_2, a_3, a_4, a_5$ be a G.P. of positive real numbers such that the A.M. of $a_2$ and $a_3$ is 117 and the G.M. of $a_2$ and $a_4$ is 108. Then the A.M. of $a_1$ and $a_5$ is:

(1) 108
(2) 117
(3) 144.5
(4) 145.5

9. If the sum of the first 15 terms of the series $3 + 7 + 14 + 24 + 37 + \ldots \ldots$ is $15k$, then $k$ is equal to:

(1) 122
(2) 81
(3) 119
(4) 126
10. \( \lim_{x \to 0} \frac{\log (\sin 7x + \cos 7x)}{\sin 3x} \) equals:

(1) \( \frac{7}{3} \)

(2) \( \frac{14}{3} \)

(3) \( \frac{1}{3} \)

(4) \( \frac{1}{3} \log 7 \)

11. If the function \( f: \mathbb{R} \to \mathbb{R} \), defined by

\[
 f(x) = \begin{cases} 
 ax, & x < 2 \\
 ax^2 - bx + 3, & x \geq 2 
\end{cases}
\]

is differentiable, then the value of \( f'(-3) + f'(3) \) is equal to:

(1) 3

(2) 4

(3) \( \frac{15}{2} \)

(4) 0

12. The sum of the abscissae of the points where the curves,

\[ y = kx^2 + (5k + 3)x + 6k + 5, \quad (k \in \mathbb{R}) \]

touch the \( x \)-axis, is equal to:

(1) \( -\frac{19}{3} \)

(2) \( -\frac{10}{3} \)

(3) \( \frac{5}{3} \)

(4) \( -\frac{4}{3} \)
13. Water is running into an underground right circular conical reservoir, which is 10 m deep and radius of its base is 5 m. If the rate of change in the volume of water in the reservoir is \( \frac{3}{2} \pi \text{ m}^3/\text{min.} \), then the rate (in m/min) at which water rises in it, when the water level is 4 m, is:

(1) \( \frac{3}{8} \)  
(2) \( \frac{1}{8} \)  
(3) \( \frac{1}{4} \)  
(4) \( \frac{3}{2} \)

14. The integral \( \int \frac{x + 2}{(x^2 + 3x + 3) \sqrt{x + 1}} \, dx \) is equal to:

(1) \( \frac{1}{\sqrt{3}} \tan^{-1} \left[ \frac{x}{\sqrt{3(x+1)}} \right] + C \)  
(2) \( \frac{2}{\sqrt{3}} \tan^{-1} \left[ \frac{x}{\sqrt{3(x+1)}} \right] + C \)  
(3) \( \frac{2}{\sqrt{3}} \cot^{-1} \left[ \frac{x}{\sqrt{x+1}} \right] + C \)  
(4) \( \frac{1}{\sqrt{3}} \cot^{-1} \left[ \frac{x\sqrt{3}}{\sqrt{x+1}} \right] + C \)  

(where \( C \) is a constant of integration)
15. The integral \[ \int_{\frac{\pi}{24}}^{\frac{5\pi}{24}} \frac{dx}{1 + \frac{3}{2}\tan 2x} \] is equal to:

1. \( \frac{\pi}{3} \)
2. \( \frac{\pi}{12} \)
3. \( \frac{\pi}{6} \)
4. \( \frac{\pi}{18} \)

16. If the line, \( y = mx \), bisects the area of the region

\[ \{(x, y) : 0 \leq x \leq \frac{3}{2}, 0 \leq y \leq 1 + 4x - x^2 \} \]

then \( m \) equals:

1. \( \frac{9}{8} \)
2. \( \frac{13}{3} \)
3. \( \frac{13}{6} \)
4. \( \frac{39}{16} \)
17. The order and the degree of the differential equation of all ellipses with centre at the origin, major axis along \( x \)-axis and eccentricity \( \sqrt{3} \) are, respectively:

(1) 1, 1  
(2) 2, 1  
(3) 1, 2  
(4) 2, 2

18. If an equilateral triangle, having centroid at the origin, has a side along the line, \( x + y = 2 \), then the area (in sq. units) of this triangle is:

(1) 6  
(2) \( 6\sqrt{3} \)  
(3) \( \frac{9}{2} \sqrt{3} \)  
(4) \( 3\sqrt{6} \)

19. The equation of the circle, which is the mirror image of the circle, \( x^2 + y^2 - 2x = 0 \), in the line, \( y = 3 - x \) is:

(1) \( x^2 + y^2 - 6x - 8y + 24 = 0 \)  
(2) \( x^2 + y^2 - 8x - 6y + 24 = 0 \)  
(3) \( x^2 + y^2 - 4x - 6y + 12 = 0 \)  
(4) \( x^2 + y^2 - 6x - 4y + 12 = 0 \)
20. The product of the perpendiculers drawn from the foci of the ellipse, \( \frac{x^2}{9} + \frac{y^2}{25} = 1 \) upon the tangent to it at the point \( \left( \frac{3}{2}, \frac{5\sqrt{3}}{2} \right) \), is:

(1) 9
(2) \( \frac{189}{13} \)
(3) 18
(4) \( 3\sqrt{13} \)

21. Which one of the following points does not lie on the normal to the hyperbola, \( \frac{x^2}{16} - \frac{y^2}{9} = 1 \) drawn at the point \( (8, 3\sqrt{3}) \)?

(1) \( (13, -\frac{1}{\sqrt{3}}) \)
(2) \( (12, \frac{1}{\sqrt{3}}) \)
(3) \( (11, \sqrt{3}) \)
(4) \( (10, \sqrt{3}) \)
22. If the shortest distance between the lines 
\( x + 2\lambda = 2y = -12z, \ x = y + 4\lambda = 6z - 12\lambda \) is 
\( 4\sqrt{2} \) units, then a value of \( \lambda \) is:

(1) \( 2 \)

(2) \( \sqrt{2} \)

(3) \( 2\sqrt{2} \)

(4) \( \frac{\sqrt{2}}{2} \)

23. The perpendicular distance from the point 
(3, 1, 1) on the plane passing through the 
point (1, 2, 3) and containing the line, 
\( \mathbf{r} = \mathbf{i} + \mathbf{j} + \lambda (2\mathbf{i} + \mathbf{j} + 4\mathbf{k}) \), is:

(1) \( \frac{1}{\sqrt{11}} \)

(2) \( \frac{4}{\sqrt{41}} \)

(3) \( 0 \)

(4) \( \frac{3}{\sqrt{11}} \)

24. Three vectors \( \mathbf{a}, \mathbf{b} \) and \( \mathbf{c} \) are such that 
\( |\mathbf{a}| = 1, |\mathbf{b}| = 2, |\mathbf{c}| = 4 \) and 
\( \mathbf{a} + \mathbf{b} + \mathbf{c} = 0 \). Then the value of 
\( 4\mathbf{a} \cdot \mathbf{b} + 3\mathbf{b} \cdot \mathbf{c} + 3\mathbf{c} \cdot \mathbf{a} \) is equal to:

(1) \(-68\)

(2) \(-26\)

(3) \(-34\)

(4) \(27\)
25. Two numbers are selected at random (without replacement) from the first six positive integers. If \( X \) denotes the smaller of the two numbers, then the expectation of \( X \), is:

(1) \( \frac{14}{3} \)

(2) \( \frac{13}{3} \)

(3) \( \frac{7}{3} \)

(4) \( \frac{5}{3} \)

26. If \( A \) and \( B \) are two independent events such that \( P(A) = \frac{3}{10} \) and \( P(A \cup B) = \frac{4}{5} \), then \( P(A \cap B) \) is equal to:

(1) \( \frac{1}{5} \)

(2) \( \frac{1}{10} \)

(3) \( \frac{3}{14} \)

(4) \( \frac{3}{35} \)
27. A bag contains three coins, one of which has head on both sides, another is a biased coin that shows up heads 90% of the time and the third one is an unbiased coin. A coin is taken out from the bag at random and tossed. If it shows up a head, then the probability that it is the unbiased coin, is:

(1) \( \frac{5}{12} \)

(2) \( \frac{5}{24} \)

(3) \( \frac{1}{3} \)

(4) \( \frac{3}{8} \)

28. The value of \( \frac{1}{\cos 285^\circ} + \frac{1}{\sqrt{3} \sin 255^\circ} \) is:

(1) \( 2\sqrt{2} \)

(2) \( \frac{4\sqrt{2}}{3} \)

(3) \( \frac{2\sqrt{2}}{3} \)

(4) \( \sqrt{3} - \sqrt{2} \)
29. An observer standing at a point P on the top of a hill near the sea-shore notices that the angle of depression of a ship moving towards the hill in a straight line at a constant speed is 30°. After 45 minutes, this angle becomes 45°. If T (in minutes) is the total time taken by the ship to move to a point in the sea where the angle of depression from P of the ship is 60°, then T is equal to:

   (1) $45(1 + \sqrt{3})$
   (2) $45\left(1 + \frac{2}{\sqrt{3}} \right)$
   (3) $45\left(2 + \frac{1}{\sqrt{3}} \right)$
   (4) $45\left(1 + \frac{1}{\sqrt{3}} \right)$

30. Which one of the following statements is a tautology?

   (1) $(p \lor q) \rightarrow q$
   (2) $p \lor (p \rightarrow q)$
   (3) $p \lor (q \rightarrow p)$
   (4) $p \rightarrow (p \rightarrow q)$
Part II / भाग II
Aptitude Test / अभिलेख परीक्षण

Directions: (For Q. No. 31 to 33). The problem figure shows the top view of an object. Identify the correct elevation from amongst the answer figures looking in the direction of the arrow.

निर्देश: (प्र. 31 से 33 के लिए)। प्रश्न आकृति में किसी वस्तु का ऊपरी दृश्य दिखाया गया है। तीर की दिशा देखते हुए उत्तर आकृतियों में से इसका सही सम्मुख दृश्य पहचानिये।

Problem Figure / प्रश्न आकृति   Answer Figures / उत्तर आकृतियाँ

31.

32.

33.

W/Page 14 SPACE FOR ROUGH WORK / रफ कार्य के लिए जगह
Directions: (For Q. No. 34 to 36). Identify the correct 3-D figure from amongst the answer figures, which has the same elevation, as given in the problem figure on the left.

निर्देश: (प्र. 34 से 36 के लिए)। 3-D उत्तर आकृतियों में से उस आकृति को पहचानिये जिस का, सम्पूर्ण दृष्टि प्रश्न आकृति से मिलती हो।

Problem Figure / प्रश्न आकृति

Answer Figures / उत्तर आकृतियाँ

34.

(1) (2) (3) (4)

35.

(1) (2) (3) (4)

36.

(1) (2) (3) (4)

Directions: (For Q. No. 37 to 40). Which one of the answer figures is the correct mirror image of the problem figure with respect to X - X?

निर्देश: (प्र. 37 से 40 के लिए)। उत्तर आकृतियों में से कौन-सी आकृति दी गयी प्रश्न आकृति का X - X से सम्बोधित सही दृष्टि प्रतिकिर्ण है?

Problem Figure / प्रश्न आकृति

Answer Figures / उत्तर आकृतियाँ

37.

X

(1) (2) (3) (4)
Directions: (For Q. No. 41 and 42). Which one of the answer figures will complete the sequence of the three problem figures?

निर्देशः (प्र० 41 और 42 के लिए)। उत्तर आकृतियों में से कौन-सी आकृति को तीन प्रश्न आकृतियों में लगाने से अनुक्रम (sequence) पूरा हो जायेगा?

<table>
<thead>
<tr>
<th>Problem Figures / प्रश्न आकृतियाँ</th>
<th>Answer Figures / उत्तर आकृतियाँ</th>
</tr>
</thead>
<tbody>
<tr>
<td>41.</td>
<td>41.</td>
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<tr>
<td></td>
<td>(1) (2) (3) (4)</td>
</tr>
<tr>
<td>42.</td>
<td>42.</td>
</tr>
<tr>
<td></td>
<td>(1) (2) (3) (4)</td>
</tr>
</tbody>
</table>

W/Page 16  SPACE FOR ROUGH WORK / रफ कार्य के लिए जगह
Directions: (For Q. No. 43 to 45). Which one of the answer figures shows the correct view of the 3-D problem figure after the problem figure is opened up?

निर्देश: (प्र. 43 से 45 के लिए)। 3-D प्रश्न आकृति को खोलने पर, उत्तर आकृतियों में से सही ढ़ेरप्रकाश की आकृति कौन-सी है?

Problem Figure / प्रश्न आकृति  Answer Figures / उत्तर आकृतियाँ

43.

44.

45.

W/Page 17 SPACE FOR ROUGH WORK / रफ कार्य के लिए जगह
Directions: (For Q. No. 46.)

One of the following answer figures is hidden in the problem figure in the same size and direction. Select the correct one.

Problem Figure / प्रश्न आकृति

Answer Figures / उत्तर आकृतियाँ

(1) (2) (3) (4)

Directions: (For Q. No. 47 to 50.)

The 3-D figure shows the view of an object. Identify the correct top view from amongst the answer figures.

Problem Figure / प्रश्न आकृति

Answer Figures / उत्तर आकृतियाँ

(1) (2) (3) (4)

(1) (2) (3) (4)

(1) (2) (3) (4)

W/Page 18  SPACE FOR ROUGH WORK / रफ़ कार्य के लिए जगह
Directions: (For Q. No. 51 to 53). The 3-D problem figure shows a view of an object. Identify the correct front view, from amongst the answer figures, looking in the direction of arrow.

निदेश: (प. 51 से 53 के लिए)। 3-D प्रश्न आकृति में एक वस्तु के एक दृश्य को दिखाया गया है। तीर की दिशा में देखते हुए, इसके सही सम्प्रेक्षण दृश्य को उत्तर आकृतियों में से पहचानिए।

Problem Figure / प्रश्न आकृति

Answer Figures / उत्तर आकृतियाँ

50.

(1)  (2)  (3)  (4)

51.

(1)  (2)  (3)  (4)

52.

(1)  (2)  (3)  (4)

53.

(1)  (2)  (3)  (4)
Directions: (For Q. No. 54 to 56).

The 3-D problem figure shows a view of an object. Identify the correct front view, from amongst the answer figures, looking in the direction of arrow.

निदेशः (प्र. 54 से 56 के लिए)

3-D प्रश्न आकृति में एक वस्तु के एक दृश्य को दिखाया गया है। तीर की दिशा में देखते हुए, इसके सही सम्मुख दृश्य को उत्तर आकृतियों में से पहचानिए।

Problem Figure / प्रश्न आकृति
Answer Figures / उत्तर आकृतियाँ

54.

55.

56.

Directions: (For Q. No. 57 to 60).

The problem figure shows the top view of objects. Looking in the direction of the arrow, identify the correct elevation, from amongst the answer figures.

निदेशः (प्र. 57 से 60 के लिए)

प्रश्न आकृति में वस्तुओं का ऊपरी दृश्य दिखाया गया है। तीर की दिशा में देखते हुए उत्तर आकृतियों में से सही सम्मुख दृश्य पहचानिए।

Problem Figure / प्रश्न आकृति
Answer Figures / उत्तर आकृतियाँ

57.

W/Page 20

SPACE FOR ROUGH WORK / रफ कार्य के लिए जगह
Problem Figure / प्रश्न आकृति  
Answer Figures / उत्तर आकृतियाँ

Directions: (For Q. No. 61). From the top view given in the problem figure identify the correct 3-D figure from amongst the answer figures.

निदेश : (प्र. 61 के लिए)। दी गयी प्रश्न आकृति के ऊपरी दृष्टि को सही 3-D उत्तर आकृतियों में से पहचानिये।
Directions: (For Q. No. 62 and 63). The problem figure shows the elevation of an object. Identify the correct top view from amongst the answer figures.

निदेश: (प्र. 62 और 63 के लिए)। प्रश्न आकृति में किसी वस्तु का सम्पूर्ण दृष्टि दिखाया गया है। उत्तर आकृतियों में से इसका सही ऊपरी दृष्टि पहचानिये।

Problem Figure / प्रश्न आकृति
Answer Figures / उत्तर आकृतियाँ

62.

63.

Directions: (For Q. No. 64 and 65). Find the odd figure out of the problem figures given below.

निदेश: (प्र. 64 और 65 के लिए)। नीचे दी गयी प्रश्न आकृतियों में से विषम आकृति पहचानिये।

64.

65.

W/Page 22 SPACE FOR ROUGH WORK / रफ कार्य के लिए जगह
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>66. Which color is obtained by mixing red and yellow colors?</td>
<td>(1) Purple (2) Pink (3) Orange (4) Brown</td>
</tr>
<tr>
<td>67. Salim Chisti mosque is located in:</td>
<td>(1) Gwalior (2) Fatehpur Sikri (3) Hyderabad (4) Delhi</td>
</tr>
<tr>
<td>68. Temperature of the Earth due to the ‘Greenhouse Effect’:</td>
<td>(1) Increases (2) Decreases (3) Remains constant (4) Keeps increasing/decreasing</td>
</tr>
<tr>
<td>69. Vertical sun protectors over wall openings help in cutting off summer sun rays on:</td>
<td>(1) South side (2) West side (3) North side (4) On all sides</td>
</tr>
</tbody>
</table>

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<th>Answer Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>66. लाल एवं पीला रंग मिलाने से कौन सा रंग बनता है?</td>
<td>(1) बैंगनी (2) गुलाबी (3) संतरी (4) भूरा</td>
</tr>
<tr>
<td>67. सलीम चिस्ती का मकबरा कहाँ पर स्थित है?</td>
<td>(1) ग्वालियर (2) फतेहपुर सीकरी (3) हैदराबाद (4) दिल्ली</td>
</tr>
<tr>
<td>68. धरती का तापमान ‘ग्रीनहाउस प्रभाव’ से:</td>
<td>(1) बढ़ता है (2) घटता है (3) एक समान रहता है (4) बढ़ता/घटता रहता है</td>
</tr>
<tr>
<td>69. खिड़की के साथ लगे खड़े सूरज संरक्षक सूर्य किरणों को किस दिशा में काटते हैं?</td>
<td>(1) दक्षिण की तरफ (2) पश्चिम की तरफ (3) उत्तर की तरफ (4) हर तरफ</td>
</tr>
</tbody>
</table>
70. Which one of the following is not a load bearing component in a building?

(1) Column
(2) Beam
(3) Partition wall
(4) Concrete floor slab

71. Which type of roof will provide maximum protection from heat radiation in a building?

(1) Painted aluminium sheeting
(2) Concrete slab with plaster
(3) Concrete slab with mud and brick tiles
(4) Concrete slab, water proofed and covered with a roof garden

72. Ellora temples are:

(1) Made in marble
(2) Built in sandstone
(3) Cut out of rock
(4) Built in wood

73. Gol Gumbaj of Bijapur is:

(1) A Fort
(2) A Mausoleum
(3) A Palace
(4) A Mosque
74. Buland Darwaza is located in:
   (1) Fatehpur Sikri
   (2) Red Fort
   (3) Agra Fort
   (4) Golconda

75. Big Ben is a:
   (1) Clock Tower
   (2) Palace
   (3) Mosque
   (4) Temple

76. IGBC stands for:
   (1) International Great Beautiful City
   (2) Indian Green Building Council
   (3) Indian Great Building Center
   (4) Indian Government Biological Center

77. Solar energy is converted to electrical energy by:
   (1) Photovoltaic cells
   (2) Electro magnets
   (3) Bio technology
   (4) Rain water
78. The ruins of Hampi are located in which State?
   (1) Karnataka
   (2) Andhra Pradesh
   (3) Kerala
   (4) Tamil Nadu

79. What is Venice famous for?
   (1) Canals
   (2) Mountains
   (3) Valleys
   (4) Springs

80. Pyramids are located in:
   (1) Rome
   (2) Egypt
   (3) Greece
   (4) Ethiopia
Space For Rough Work / रफ कार्य के लिए जगह
Space For Rough Work / रफ कार्य के लिए जगह
<table>
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<tr>
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<th>Part II</th>
<th>Part III</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 objective type questions of Mathematics consisting of FOUR (4) marks each for each correct response.</td>
<td>50 objective type questions consisting of FOUR (4) marks for each correct response.</td>
<td>2 questions carrying 70 marks which are to be attempted on a separate Drawing Sheet which is also placed inside this Test Booklet. Marks allotted to each question are written against each question. For each incorrect response in Part I and Part II, ¼ (one-fourth) marks of the total marks allotted to the question (i.e. 1 mark) would be deducted from the total score. No deduction from the total score, however, will be made if no response is indicated for an item in the Answer Sheet.</td>
</tr>
</tbody>
</table>

2. Handle the Test Booklet, Answer Sheet and Drawing Sheet with care, as under no circumstances (except for discrepancy in Test Booklet Code and Answer Sheet Code), another set will be provided.

3. The candidates are not allowed to do any rough work or writing work on the Answer Sheet. All calculations/writing work are to be done on the space provided for this purpose in the Test Booklet itself, marked ‘Space for Rough Work’. This space is given at the bottom of each page and in five pages (Page 27-31) at the end of the booklet.

4. Each candidate must show on demand his/her Admit Card to the Invigilator.

5. No candidate, without special permission of the Superintendent or Invigilator, should leave his/her seat.

6. On completion of the test, the candidates should not leave the examination hall without handing over their Answer Sheet of Mathematics and Aptitude Test-Part I & II and Drawing Sheet of Aptitude Test-Part III to the Invigilator on duty and sign the Attendance Sheet at the time of handing over the same. Cases where a candidate has not signed the Attendance Sheet the second time will be deemed not have handed over these documents and dealt with as an unfair means case. The candidates are also required to put their left hand THUMB impression in the space provided in the Attendance Sheet. However, the candidates are allowed to take away with them the Test Booklet of Mathematics and Aptitude Test-Part I & II.

7. Use of Electronic/Manual Calculator or drawing instruments (such as scale, compass etc.) are not allowed.

8. The candidates are governed by all Rules and Regulations of the Examination Body with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per the Rules and Regulations of the Examination body.

9. No part of the Test Booklet, Answer Sheet and Drawing Sheet shall be detached/folded or defaced under any circumstances.

10. The candidates will write the Test Booklet Number as given in the Test Booklet, Answer Sheet and Drawing Sheet in the Attendance Sheet also.

11. Candidates are not allowed to carry any textual material, printed or written, bits of papers, pager, mobile phone, electronic device or any other material except the Admit Card inside the examination room/hall.