Mathematics Standard
Class 10th
Marks 80

General Instructions:

i. This question paper comprises four sections—A, B, C, and D. This question paper carries 40 questions. All questions are compulsory.

ii. Section—A—Q No. 1 to 20 comprises 20 questions of one marks each

iii. Section—B—Q 21—26 comprises of 6 questions of two marks each

iv. Section—C—Q 27 to 34 comprises of 8 questions of three marks each

v. Section—D—Q 35 to 40 comprises of 6 questions of four marks each.

There is no overall choice in the question paper. However an integral choice has been provided in 2 questions of one mark, 2 questions of two marks, 3 questions of three marks and 3 questions of four marks. You have to attempt only one of the choice in such questions.

Section-A

Question number 1 to 10 are MCQs of 1 marks each. Select the correct option:

Q1. The HCF of 2 and 11 is
   a) 2          b) 11          c) 22          d) 1

Q2. A polynomial of degree ‘2’ is called
   a) Quadratic poly  b) Zero Poly  c) Quartic Poly  d) None of these

Q3. A Quadratic Equation ax² + bx + c=0, a≠0 has two equal roots if:
   a) D>0          b) D=0          c) D<0          d) N.O.T

Q4. The Common difference of the AP 6, 9, 12, 15 ---- is:
   a) 6          b) -3          c) 9          d) 3

Q5. The distances of the point A(x,y) from the Origin O (0,0) is
   a) \( \sqrt{x^2 + y^2} \)  b) \( \sqrt{x^2 - y^2} \)  c) \( x^2 \)  d) \( y^2 \)

Q6. A line which touches a circle at one point is called
   a) Secant  b) Chord   c) tangent  d) N.O.T

Q7. Area of circle is given by:
   a) \( \pi r^3 \)  b) \( 2\pi r \)  c) \( \pi r^2 \)  d) N.O.T
Q8. Which of the following cannot be the probability of an event:
   a) 2/3  b) -1.5  c) 15%  d) 0.7

Q9. The value of Sin 18°/Cos 72° is:
   a) -1  b) 0  c) 1  d) \sqrt{3}

Q10. The mean of the grouped data can be found by direct method as:
   a) \( \sum \frac{f_i}{f_{xi}} \)  b) \( \sum \frac{x_i}{f_{xi}} \)  c) \( \sum \frac{f_i}{x_i} \)  d) \( \sum \frac{f_{xi}}{f_i} \)

In Q.Nos 11 to 15, fill in the blanks. Each question is of 1 marks each.

Q11. LCM \((a,b)\) x HCF \((a,b)\) = \(axb/a+b\).

Q12. \(x=1, y=2\) is the solution of the pair of linear equations
   \(x+2y=3\) and \(x+y=3\) ———— (Yes/No)

Q13. \(q_n = q + (n+1)d\) is the general term of an AP ———— (True/False)

   OR

   Sum of first \(\varphi\) term of an A.P is given by
   \(S\varphi=\varphi/2 (2a+(\varphi-1)d)\) ———— (True/False)

Q14. \(\sin\Theta = \cos\Theta\) for all \(\theta\) values of \(\Theta\) ———— (True/False)

Q15. All ———— triangles are similar (Isosceles/Equilateral).

Q16. To Q20 are short answer type questions of 1 marks each.

Q16. Define Collinear Points.

   OR

   Write a formula for finding the area of a \(\triangle ABC\) with Coordinates of the Vertices as \(A(x_1,y_1), B(x_2, y_2), C(x_3,y_3)\).

Q17. Write One application of Trigonometry

Q18. State Pythagoras theorem?

Q19. If \(P(E) = 0.5\), find \(P(\text{not} E)\)?

Q20. Given \(r=1\) unit, find the vol. of Sphere.
Section-B

QNos 21 to 26 Carry 2 marks each

Q21. 2 Cubes each of volume 64 cm$^3$ are joined end to end. Find the surface area of the resulting Cuboid.

Q22. Given that HCF(306,657)=9, find LCM(306,657).

Q23. Check for Consistency

\[ 5x-4y=8=0 \]

\[ 10x-8y+16=0 \]

Q24. Find the values of \( \frac{2\tan 45^\circ}{1+\tan^2 45^\circ} \).

OR

Evaluate

\[ \sin 25^\circ \cos 65^\circ + \cos 25^\circ \sin 65^\circ \]

Q25. One A die is thrown once. Find the probability of getting an odd number.

Q26. The marks obtained by 30 students of class X of a certain school in a mathematics paper consisting of 100 marks are presented in the table below. Find the mean of the marks obtained by the students.

<table>
<thead>
<tr>
<th>Marks Obtained ((X_i))</th>
<th>10</th>
<th>20</th>
<th>36</th>
<th>40</th>
<th>50</th>
<th>56</th>
<th>60</th>
<th>70</th>
<th>72</th>
<th>80</th>
<th>88</th>
<th>92</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Students ((f_i))</td>
<td>11</td>
<td>13</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Section-C

Q27. To 34 carry 3 marks each:

Q27. Find the zeros of the quadratic polynomial, and verify the relationship between the zeros and the coefficients.

\[ 4x^2 - 4x + 1 \]

OR

Divide \( x^2 - 3x^2 + 5x - 3 \) by \( x - 2 \) and find the quotient and the remainder.

Q28. Solve the pair of linear equation by substitution method.
Q29. Find the value of \( K \), so that the quadratic equation have two equal roots \( 2x^2 + Kx + 3 = 0 \).

Q30. Which term of an AP: 3, 8, 13, 18, ..., is 78?

Find the sum of the first 15 multiplies of 8

Q31. Evaluate \( \frac{\sin^2 63^\circ + \sin^2 27^\circ}{\cos^2 17^\circ + \cos^2 73^\circ} \)?

Q32. Prove that the tangents drawn at the ends of a diameter of a circle are parallel

OR

Prove that the \( |lm \) circumscribing a circle is a rhombus.

Q33. Find the area of a sector of a circle with radius 6cm if angle of the sector is 60°.

Q34. A drinking glass is in the shape of a frustum of a cone of height 14cm. The diameter of its two circular ends are 4cm and 2cm. Find the capacity of the glass.

Section-D

QNo. 35 to 40 carry 4 marks each

Q35. Find the roots of the quadratic equation \( 4x^2 + 4\sqrt{3}x + 3 \) by the method of completing the square.

OR

Find two numbers whose sum is 27 and product is 182.

Q36. The angle of elevation of the top of a tower from a point on the ground which is 30m away from the foot of the tower is 30°. Find the height of the tower.

Q37. Find the points on the x-axis which is equidistant from (2, -5) and (-2, 9)

OR

Find the ratio in which the line segment joining the points (-3, 10) and (6, -8) is divided by (-1, 6).

Q38. The ratio of the area of two similar \( \Delta \)s is equal to the square of the ratio of their corresponding sides.

OR
Q39. Construct a triangle with sides 5cm, 6cm, & 7cm and then another triangle whose sides are 7/5 of the corresponding sides of the first Δ.

Q40. The distribution below gives the weight of 3 students of a class. Find the median weight of the students.

<table>
<thead>
<tr>
<th>Weight (in kg)</th>
<th>40-45</th>
<th>45-50</th>
<th>50-55</th>
<th>55-60</th>
<th>60-65</th>
<th>65-70</th>
<th>70-75</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Students</td>
<td>2</td>
<td>3</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

- The paper has been prepared as per the CBSE pattern after a minor change in marks distribution of different Topics of Mathematics.
- The question paper has been prepared from the Text book of Mathematics provided by BOSE Sgr.
- The question paper comprises 40 questions of 80 marks (summative assessment)
- Internal assessment of 20 marks:
  Like (i) Pen paper test (ii) Project work, like measurement of school campus, perimeter of boundary etc. (iii) Attendance and participation.

Marks distribution

1. Real No’s
   4 marks
   4 marks

2. Polynomials
   4 marks
   1+1+2

3. Linear Eq.in two variables
   6 marks
   1+2+3

4. Quadratic Equation
   8 marks
   1+3+4

5. Arithmetic progression
   5 marks
   1+1+3

6. Trigonometry
   7 marks
   1+1+2+3

7. Application to Trigonometry
   5 marks
   1+4

8. Co-ordinate Geometry
   6 marks
   1+1+4

9. Triangles
   6 marks
   1+1+4

10. Circles
    5 marks
    1+1+3

11. Construction
    4 marks
    4

12. Area related to Os
    4 marks
    1+3

13. Surface Area & Volumes
    6 marks
    1+2+3

14. Probability
    4 marks
    1+1+2

15. Statistics
    6 marks
    2+4

30 Marks

Qo Mark