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SAMPLE PAPER TEST 07 (BASIC) (2019-20)

SUBJECT: MATHEMATICS MAX. MARKS: 80
CLASS: X DURATION : 3 HRS

General Instruction:
(i) All the questions are compulsory.
(ii) The question paper consists of 40 questions divided into 4 sections A, B, C, and D.
(iii) Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
(iv) There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
(v) Use of calculators is not permitted.

SECTION – A
Questions 1 to 20 carry 1 mark each.

1. The decimal expansion of \( \frac{147}{120} \) will terminate after how many places of decimal?
   (a) 1  (b) 2  (c) 3  (d) will not terminate

2. Euclid’s division lemma states that for two positive integers a and b, there exist unique integers q and r such that \( a = bq + r \), where r must satisfy
   (a) \( 1 < r < b \)  (b) \( 0 < r \leq b \)  (c) \( 0 \leq r < b \)  (d) \( 0 < r < b \)

3. Given that the LCM(91, 26) = 182, HCF(91, 26) is
   (a) 13  (b) 26  (c) 7  (d) 9

4. The quadratic polynomial whose sum of zeroes is 3 and product of zeroes – 2 is
   (a) \( x^2 + 3x - 2 \)  (b) \( x^2 - 2x + 3 \)  (c) \( x^2 - 3x + 2 \)  (d) \( x^2 - 3x - 2 \)

5. If \( \alpha \) and \( \beta \) are the zeroes of \( x^2 + 5x - 6 \), then the value of \( \alpha + \beta - \alpha \beta \)
   (a) 1  (b) 2  (c) 3  (d) none of these

6. The distance between the points A(0, 6) and B(0, –2) is
   (a) 6  (b) 8  (c) 4  (d) 2

7. If \( P \left( -\frac{a}{3} , 4 \right) \) is the mid-point of the line segment joining the points Q (–6, 5) and R (–2, 3),
   then the value of a is
   (a) –4  (b) –12  (c) 12  (d) –6

8. TP and TQ are the two tangents to a circle with center O so that angle \( \angle POQ = 130^0 \). Find \( \angle PTQ \).
   (a) 50\(^0\)  (b) 70\(^0\)  (c) 80\(^0\)  (d) none of these

9. For the following distribution:

<table>
<thead>
<tr>
<th>Class</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>10</td>
</tr>
<tr>
<td>5-10</td>
<td>15</td>
</tr>
<tr>
<td>10-15</td>
<td>12</td>
</tr>
<tr>
<td>15-20</td>
<td>20</td>
</tr>
<tr>
<td>20-25</td>
<td>9</td>
</tr>
</tbody>
</table>

the lower limit of the modal class is
(a) 5  (b) 10  (c) 15  (d) 20
10. Cards are marked with numbers 1 to 25 are placed in the box and mixed thoroughly. What is the probability of getting a number divisible by 5?
   (a) 1  (b) 0  (c) $\frac{1}{25}$  (d) $\frac{1}{5}$

11. The value of $k$ will the pair of linear equations $3x + y = 1$ and $(2k - 1)x + (k - 1)y = 2k + 1$ have no solution is _______

   OR

   The value of $k$ for which the quadratic equation $4x^2 - 3kx + 1 = 0$ has real and equal roots is ______

12. The radius of the circle whose end points of diameter are $(-4, 1), (2, -3)$ is ______

13. If $\triangle ABC$ is right angled at B, then the value of $\sin (A + C)$ is _____

14. If $\tan A = \frac{12}{5}$, then the value of $\sin A$ is ______

15. Let $\triangle ABC \sim \triangle DEF$ and their areas be, respectively, 64 cm$^2$ and 121 cm$^2$. If $EF = 15.4$ cm, then the value of $BC$ is ______

16. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find the length of the arc.

17. A bag contains lemon flavoured candies only. Malini takes out one candy without looking into the bag. What is the probability that she takes out a lemon flavoured candy?

18. In $\triangle ABC$, right-angled at B, $AB = 5$ cm and $\angle ACB = 30^\circ$ then find the length of the side $BC$.

   OR

   If $\sin 30^\circ = \cos (\theta - 6^\circ)$ here, $30^\circ$ and $(\theta - 6^\circ)$ are acute angles, find the value of $\theta$.

19. Which term of an AP, 21, 18, 15, ... is zero?

20. A ladder 10 m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from base of the wall.

SECTION – B

Questions 21 to 26 carry 2 marks each.

21. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears (i) a two-digit number (ii) a perfect square number.

   OR

   A die is thrown twice. What is the probability that (i) 5 will not come up either time? (ii) 5 will come up at least once?

22. A card is drawn at random from a pack of 52 playing cards. Find the probability that the card drawn is (a) a king of black colour (b) a face card.

23. Find the area of a quadrant of a circle whose circumference is 22 cm.

24. Evaluate: $\sin 25^\circ \cos 65^\circ + \cos 25^\circ \sin 65^\circ$

   OR

   If $\tan A = \cot B$, prove that $A + B = 90^\circ$.

25. Divide $p(x) = 3x^3 + x^2 + 2x + 5$ by $g(x) = 1 + 2x + x^2$ and find the quotient and remainder.

26. A quadrilateral $ABCD$ is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$
27. Prove that \( \sqrt{3} \) is an irrational number.

OR

Show that any positive odd integer is of the form 6q + 1, or 6q + 3, or 6q + 5, where q is some integer.

28. Find the zeroes of the quadratic polynomial \( 6x^2 - 7x - 3 \) and verify the relationship between the zeroes and the coefficients of the polynomial.

29. Draw the graphs of the equations \( x - y + 1 = 0 \) and \( 3x + 2y - 12 = 0 \). Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis.

30. In the below figure, OACB is a quadrant of a circle with centre O and radius 3.5 cm. If OD = 2 cm, find the area of the (i) quadrant OACB, (ii) shaded region.

31. To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1m each. 100 flower pots have been placed at a distance of 1m from each other along AD, as shown in the below figure. Niharika runs \( \frac{1}{4} \)th the distance AD on the 2nd line and posts a green flag. Preet runs \( \frac{1}{5} \)th the distance AD on the eighth line and posts a red flag.

(i) What is the distance between both the flags?
(ii) If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?
32. Prove that: \( \frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \sec \theta + \tan \theta \)

OR

Prove that: \((\sin A + \csc A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A\)

33. Construct a triangle ABC with BC = 7 cm, \(\angle B = 60^\circ\) and AB = 6 cm. Construct another triangle whose sides are \(\frac{3}{5}\) times the corresponding sides of \(\Delta ABC\).

OR

Draw a line segment of length 10 cm and divide it in the ratio 3 : 5.

34. In the below figure, XY and X’Y’ are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X’Y’ at B. Prove that \(\angle AOB = 90^\circ\).

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\text{SECTION – D}
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Questions 35 to 40 carry 4 marks each.

35. From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45°, respectively. If the bridge is at a height of 3 m from the banks, find the width of the river.

36. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

37. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms.

OR

How many terms of the AP: 9, 17, 25, . . . must be taken to give a sum of 636?

38. Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

OR

State and prove Basic proportionality theorem.

39. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in her field, which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 km/h, in how much time will the tank be filled?

OR

A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

40. Draw more than ogive for the following frequency distribution:

<table>
<thead>
<tr>
<th>Marks</th>
<th>0 – 10</th>
<th>10 – 20</th>
<th>20 – 30</th>
<th>30 – 40</th>
<th>40 – 50</th>
<th>50 – 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students</td>
<td>5</td>
<td>8</td>
<td>6</td>
<td>10</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

Also find the median from the graph.