Nos. 1 to 10 are multiple choice questions. Select the correct options.

1. HCF of 144 and 198 is
   (a) 9
   (b) 18
   (c) 6
   (d) 12

2. The median and mode respectively of a frequency distribution are 26 and 29. Then its mean is
   (a) 27.5
   (b) 24.5
   (c) 28.4
   (d) 25.8

3. In a circle of radius 7 cm, tangent PT is drawn from a point P such that PT = 24 cm. If O is the centre of the circle, then length of PR is
   (a) 30 cm
   (b) 28 cm
   (c) 32 cm
   (d) 25

4. 225 can be expressed as
   (a) 5 × 3^2
   (b) 5^2 × 3
   (c) 5^2 × 3^2
(d) $5^3 \times 3$

5. The probability that a number selected at random from the numbers 1, 2, 3, 15 is a multiple of 4
   is
   (a) $\frac{4}{15}$
   (b) $\frac{2}{15}$
   (c) $\frac{1}{15}$
   (d) $\frac{1}{5}$

6. If one zero of quadratics $(Kx^2 + 3x + k)$ is 2, then the value of k is
   (a) $\frac{5}{6}$
   (b) $-\frac{5}{6}$
   (c) $\frac{6}{5}$
   (d) $-\frac{6}{5}$

7. $2.\overline{35}$ is
   (a) an integer
   (b) a rational number
   (c) an irrational number
   (d) a natural number

8. The graph of a polynomial is shown in then the number of its zeroes is
   (a) 3
   (b) 1
9. Distance of point P(3,4) from x-axis is
   (a) 3 units
   (b) 4 units
   (c) 5 units
   (d) 1 units

10. If the distance between the points A (4, p) and B (1,0) is 5 units, then the value (s) of p is (are)
    (a) 4 only
    (b) -4 only
    (c) ± 4
    (d) 0

11. If the points C (k,4) divides the line segment joining two points A (2,6) and B (5,1) in ration 2 : 3 the value of K is ............
    OR
    If points A (-3,12) B (7,6) and C (x,9) are collinear, then the value of x is ............

12. If the equations kx-2y = 3 and 3x + y = 5 represent two intersecting lines at unique point, then the value of k is ............
    OR
    If quadratic equation 3x^2 – 4x + k =0 has equal roots, then the value of k is ..........
20. The $n^{th}$ term of an A.P. is $(7-4n)$, then what is its common difference?

SECTION – B

Question numbers 21 to 26 carry 2 marks each.

21. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball at random from the bag is three times that of red ball, find the number of blue balls the bag.

OR

Prove that $\frac{1}{1+\sin \theta} = \sec \theta - \tan \theta$.

22. Prove that $\frac{\tan^2 \theta}{1+\tan^2 \theta} + \frac{\cot^2 \theta}{1+\cot^2 \theta} = 1$.

23. Two different dice are thrown together, find the probability that the sum of the number appeared is less than 5.

OR

Find the probability that 5 Sundays occur in the month of November of a randomly selected year.

24. In a circle touches all the four sides of a quadrilateral $ABCD$. If $AB = 6$ cm, $BC = 9$ cm, $CD = 8$ cm, then find the length of $AD$.

25. The perimeter of a sector of a circle with radius 6.5 cm, is 31 cm, then find the area of the sector.
26. Divide the polynomial \((4x^2 + 4x + 5)\) by \((2x + 1)\) and write the quotient and the remainder.

SECTION – C

Question numbers 27 to 34 carry 3 marks each.

27. If \(\alpha\) and \(\beta\) are the zeroes of the polynomial \(f(x) = x^2 = 4x - 5\) then the value of \(\alpha^2 + \beta^2\).

28. Draw a circle of radius 4cm. From a point 7 cm away the centre of circle. Construct a pair of tangents to the circle.

OR

Draw a line segment of 6 cm and divide it in ratio 3 : 2.

29. A solid metallic cuboid of dimension 24 cm \(\times\) 11 cm \(\times\) 7 cm is melted and recast into solid cones of base radius 3.5 cm and height 6 cm. find the number of cones so formed.

30. Prove that \((1 + \tan A = \sec A ) \times (1 + \tan A + \sec A) = 2 \tan A\)

OR

Prove that \(\csc \theta + \csc \theta - 1 + \csc \theta + 1 = 2 \sec^2 \theta\)

31. Give the \(\sqrt{3}\) is an irrational number, show that \((5 + 2 \sqrt{3})\) is an irrational number.

OR

An army contingent of 612 members is to march behind an army band of 48 members in a parade. the two groups are the march in the same number of columns. What is the maximum number of columns in which they can march?

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

Read the following passage carefully and then answer the questions given at the end.

33. To conduct sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of each. 100 flower pots have been placed at a distance of 1 m from each other along AD, as shown in. 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 the two flags?

(ii) If Rashmi has to post a blue flag exactly half way between the line segments joining the two flags, where should post the blue flag?
34. Solve graphically: \(2x + 3y = 2\), \(x - 2y = 8\)

SECTION-D

Question number 35 to 40 carry 4 marks each.

35. A two digit number is such that the product of its digits is 14. It 45 is added to the number; the digits interchange their places. Find the number.

36. If 4 times the 4\(^{th}\) term of an A.P. is equal to 18 times the 18\(^{th}\) term, then find the 22\(^{nd}\) term.

OR

How many terms of the A.P.: 24, 21, 18 \ldots \ must be taken so that their sum is 78?

37. The angle of elevation of the top of a building from the foot of a tower is 30\(^{0}\). The angle of elevation of the top of the tower from the foot of the building is 60\(^{0}\). If the tower 60 m high, find the height of the building.

38. In \(\text{DEFG} \) is a square in \(\triangle \text{ABC} \) right angled at \(A\).

Prove that
(i) \( \triangle AGF \sim \triangle DBG \)

(ii) \( \triangle AGF \sim \triangle EFC \)

In an obtuse \( \triangle ABC \) (\(<B \) is obtuse), \( AD \) is perpendicular to \( CB \) produced. Then prove that \( AC^2 = AB^2 + BC^2 + 2BC \times BD \).

39. An open metal bucket is in the shape of a frustrum of cone of height 21 cm with radii of its lower and upper ends are 10 cm and 20 cm respectively. Find the cost of milk which can completely fill the bucket at the rate of \( \text{₹}40 \) per liter.

OR

A solid is in the shape of a cone surmounted on a hemisphere. The radius of each of them being 3.5 cm and the total height of the solid is 9.5 cm. find the volume of the solid.

40. Find the mean of the following data:

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<th>20-40</th>
<th>40-60</th>
<th>60-80</th>
<th>80-100</th>
<th>100-120</th>
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<tbody>
<tr>
<td>Frequency</td>
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<td>35</td>
<td>52</td>
<td>44</td>
<td>38</td>
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