DISTRICT INSTITUTE OF EDUCATION AND TRAINING, CHITRADURGA

10TH STANDARD MODEL PAPER II 2020-21

SUB: MATHEMATICS **DATE :**

TIME : 3hours 15 min **MARKS : 80**

I Choose the correct answer from the four answers given in the following questions: - $\mathbf{1X8 = 8}$

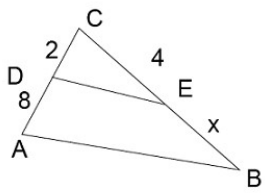
1. The 15TH term of an Arithemaic Progression 1,5,9,13……. is
   a) 49 b) 52 c) 57 d) 56

2. A formula to find out the distance between the point A(x,y) with the origin is _____
   a) $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ b) $\sqrt{(x_2 + x_1)^2 + (y_2 + y_1)^2}$
   c) $\left(\sqrt{x^2 + y^2}\right)$ d) $\left(\sqrt{x - y}\right)^2$

3. When the linear equations $a_1x + b_1y + c_1 = 0$ $a_2x + b_2y + c_2 = 0$ are parallel to each other then_____
   a) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ b) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$
   c) $\frac{a_1}{a_2} = \frac{b_1}{b_2}$ d) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

4. One root of the equation $(x + 5)(x + 2) = 0$ is -2 then another root is _____
   a) +2 b) +5 c) –5 d) –2

5. In the figure DE ‖ AB then find the vlue of $'x'$.
   (a) 12 (b) 16 (c) 10 (d) 32



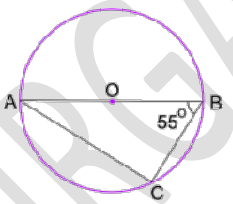
6 The length of the tangent drawn from an external point $10cm$ from the centre of the circle of radius $6cm$ is _____
   (a) 8 cm (b) 7 cm (c) 4 cm (d) 9 cm

7. The formula to find the volume of a sphere is _____
   a) $\pi r^2 h$ b) $\frac{4}{3}\pi r^3$ c) $\frac{1}{3}\pi r^3$ d) $\pi r(r + h)$

8. If $sin\,\theta = \frac{3}{5}$ and $cos\theta = \frac{4}{5}$ then value of $tan\,\theta$ _____
   a) $\frac{4}{3}$ b) $\frac{5}{3}$ c) $\frac{5}{4}$ d) $\frac{3}{4}$

II One marks questions :– $\mathbf{1X8 = 8}$

9. The $'n'th$ term of an Arithematic Progression is $a_n = 3n - 2$ find the '9'th term.
10. If $cosA = \frac{5}{13}$ then find the value of $secA$
11. Find the roots of the equation $x^2 - 25 = 0$
12. In $\triangle ABC$, $AB^2 + BC^2 = AC^2$ name the right angle.
13. Write the formula to find the total surface area of a circular based straight cone having radius $'r'$ and slant height $'l'$.
14. State Phythogorus theorem.
15. Find the distance between the Point (,) and origin.
16. In the figure AB is diameter find angle ∟BAC .



III Two marks questions:– $\mathbf{2X8 = 16}$

17. Find the 21 st term of an A.P 5, 9, 13, 17, ...
18. Solve the equations : $2x + 3y = 16$ and $2x - 2y = -4$
19. Find the coordinates of the midpoint of the linesegment join the coordinates (4, 5) and (2, 7)
20. Draw a pair of tangents to a circle with a radius of 5 cm which are inclined each other at an angle of 120^0
21. Find the value of the discriminant of the quadratic equation $2x^2 - 5x - 1 = 0$ and hence write the nature of roots of equation.
22. Prove $\frac{cotA - cosA}{cotA + cosA} = \frac{1-s}{1+sin}$
23. Find total surface area of a cubiod of dimensions $4cm \times 5cm \times 7cm$
24. A man of height 6 foot standing near a pole of height 8 foot. Find the length of the shadow of the pole at a fixed time in a day, if the length of the shadow man is 9 foot.

IV Three marks questions:– **3X9=27**

25. Prove that the tangents drawn from the external point to the circle, are equal.
26. Draw a circle of radius 3.5 cm and construct a pair of tangents to it from an external point 8 cm away from the centre. Measure the length of the tangents.

27. Construct a triangle PQR with sides QR=6.5cm, PQ=5.5cm, PR =5cm and construct another triangle whose sides are $\frac{4}{3}$ of the corresponding sides of the constructed triangle.

28. In an A.P the sum of the first 14 terms is 1050 and first term is 10, then find the 20^{th} term of the A.P.

29. Find the area of the triangle whose vertices are (1, 3), (4, 4) and (3, 5).

30. If the equation $2x^2 + kx + 8 = 0$ has equal roots , then find the value of k.

31. Prove $\frac{1+tan^2A}{1+cot^2A} = tan^2A$

32. Find the mean for the following data

Class interval	10–20	20–30	30–40	40–50	50–60	60–70	70–80
frequency	4	8	10	12	10	4	2

33. The length of the side of a cube is 10cm. Find the total surface area of the solid when two such cubes are joined together side by side.

V Four marks questions:– 4X4=16

34. Find the solution of the following pair of linear equations by the graphical method, $x + y = 8$ & $x - y = 2$

35. The nth term of an A.P is $a_n = 3 + 2n$, find the sum of first 24 terms.

36. Draw a "more than type" of ogive for the given data :

Class Interval	Frequency
15 or above 15	6
30 or above 30	8
45 or above 45	10
60 or above 60	6
75 or above 75	4

37. The angle of elevation of the bottom and top of a vertical pole placed on a 20m height building from a point on a horizontal ground is 45^0 and 60^0 .Find the height of the pole.

VI Five marks questions:– 5X1=5

38. State and prove Thales theorem.