DR.B.R.AMBEDKAR POLYTECHNIC COLLEGE, YANAM

Regulations 2023

BOARD PRACTICAL EXAMINATION - APRIL 2024

APPLIED MATHEMATICS-1

Course: Basic Engineering Date: 04-05-2024

Subject & Code: APPLIED MATHEMATICS-1(MA23241)
BRANCH: CIVIL ENGINEERING
Year/Sem: I Year/II Sem
Time: 2 Hours Max. Marks: 30

Answer any 15 questions 15 x 2 = 30

1. What is the equation of the circle with centre and origin and radius 1 unit ?
2. Find the equation of the circle with centre (-5, 7) and radius 5 units.
3. Find the centre and radius of the circle $x^2 + y^2 + 2x + 2y - 7 = 0.$
4. Show that the circles $x^2 + y^2 - 4x + 2y + 5 = 0$ and $x^2 + y^2 - 4x + 2y + 11 = 0$ are concentric.
5. Find the equation of the circle passing through the point (5,4) and concentric to the circle $x^2 + y^2 - 8x + 12y + 15 = 0$
6. Prove that the circles $x^2 + y^2 - 4x + 6y + 4 = 0$ and $x^2 + y^2 + 2x + 4y + 4 = 0$ cut orthogonally
7. Prove that the circles $x^2 + y^2 + 2x - 4y - 3 = 0$ and $x^2 + y^2 - 8x + 6y + 7 = 0$ touch each other.
8. Prove that the equation $x^2 + 6xy + 9y^2 + 4x + 12y - 5 = 0$ is a parabola.
9. Show that the equation $x^2 + 4y^2 + 4x + 24y + 31 = 0$ represents an ellipse.
10. Check whether the conic $2x^2 - 16xy + 8y^2 - y + 3 = 0$ represents hyperbola.
11. Find the equation of the parabola with focus at (1.-1) and directrix x - y =0
12. Evaluate $\lim_{x \to 2}(x^3 + 4x^2 - 3)$
13. Evaluate $\lim_{x \to 1} \frac{x^4 + x^2 - 1}{x^2 + 5}$
14. Find dy/dx if $y = x + x^2 + x^3$
15. Find dy/dx if $y = 3x^2$
16. Find d/dx $(5x^2 - 3x + 1)$
17. Find d/dx $(x^3 \sin x)$
18. Find d/dx $(x^2 \sin x \log x)$
19. Find d/dx $(\frac{x + 3}{x - 3})$
20. Find d/dx $(\cos(\log x))$