

DR.B.R.AMBEDKAR POLYTECHNIC COLLEGE, YANAM
BOARD PRACTICAL EXAMINATION - APRIL - 2024
Regulations 2023

Course: Basic Engineering

Date: 04-05-2024

Subject & Code: APPLIED MATHEMATICS-2(MA23242)

BRANCH: CE and ECE

Year/Sem: I Year/II See

Time: 3 Hours

Max. Marks: 30

Answer any 15 questions

15 x 2 = 30

1. Prove that the equation $x^2 + 6xy + 9y^2 + 4x + 12y - 5 = 0$ is a parabola.
2. Show that the equation $x^2 + 4y^2 + 4x + 24y + 31 = 0$ represents an ellipse.
3. Check whether the conic $2x^2 - 16xy + 8y^2 - y + 3 = 0$ represents hyperbola.
4. Find the equation of the parabola with focus at (1,-1) and directrix $x - y = 0$
5. Find the equation of the parabola with focus at (2, 1) and directrix $2x + y + 1 = 0$.
6. What is the principal value of $\sin^{-1}(\frac{1}{2})$
7. What is the principal value of $\cos^{-1}(\frac{1}{2})$
8. Find the value of $i^2 + i^3 + i^4$
9. If $z_1 = 1 + i$, $z_2 = 3 + 2i$, Find $z_1 + z_2$
10. If $z_1 = 1 + 4i$, $z_2 = -3 + 6i$, Find $3z_1 + 2z_2$
11. If $z_1 = 1 + i$, $z_2 = 3 + 2i$, Find $z_1 - z_2$
12. If $z_1 = 2 + 2i$, $z_2 = 3 + 2i$, Find $z_1 z_2$
13. Find the Real and Imaginary part of $\frac{2 + 3i}{4 + 5i}$
14. Find the Modulus and Amplitude of $1 + \sqrt{3}i$
15. Find the Modulus and Amplitude of $\frac{5 - i}{2 - 3i}$
16. Simplify: $(\cos 15^\circ + i \sin 15^\circ)^6$
17. Simplify: $(\cos \theta + i \sin \theta)^2 (\cos 3\theta + i \sin 3\theta)$
18. If $a = \cos x + i \sin x$, $b = \cos y + i \sin y$. Find ab & $1/ab$
19. Simplify: $\frac{\cos 5\theta + i \sin 5\theta}{\cos 3\theta + i \sin 3\theta}$
20. Simplify using Demovires theorem $\frac{(\cos 3\theta - i \sin 3\theta)^5 (\cos 4\theta + i \sin 4\theta)^4}{(\cos 2\theta + i \sin 2\theta)^7 (\cos 3\theta - i \sin 3\theta)^6}$