

MATH.123 APPLIED MATHEMATICS-I

PAPER 'B' (Subjective)

Time: 2:30 Hours

Marks: 60

Section-I

Q.1 Write short answers to any Eighteen (18) from the following questions.

18x2=36

1. Resolve into partial fraction $\frac{1}{x^2-1}$
2. Write an identity equation of $\frac{2x^4-3x^2-4x}{(x+1)(x^2+2)^2}$
3. Write an identity equation of $\frac{2x}{(x-2)(x+5)}$
4. What is partial fraction.
5. Factorize $9a^2 + 64b^2$
6. Simplify the complex no. $(2 + 5i) + (-3 + i)$
7. Prove that if $Z = \bar{Z}$ then \bar{Z} is real
8. Find multiplicative inverse of $(-3,4)$
9. Show that $\left| \frac{1+2i}{2-i} \right| = 1$
10. Multiply the binary number $111_2 \times 101_2$
11. Convert octal number $(107)_8$ to binary number.
12. Convert the decimal number $(932)_{10}$ to octal number.
13. Define logic gate.
14. Prove by Boolean Algebra $X+XZ=X$
15. Write distance formula between two points and give one example.
16. Show that the points $(1,0)$, $(4,-12)$ and $(2,-4)$ are collinear.
17. Find the equation of a line through $(-1,2)$ and $(3,4)$.
18. Find the distance from the point $(-2,1)$ to the line $3x+4y-12=0$
19. Find the coordinates of the mid point of the segment $P_1(3,7)$ $P_2(-2,3)$
20. Reduce the equation $3x + 4y - 2 = 0$ into intercept form
21. Find equation of line when $\theta = 45^\circ$ and $P = \frac{1}{\sqrt{2}}$
22. Find K so that the lines $x - 2y + 1 = 0$ $2x - 5y + 3 = 0$ and $5x + 9y + k = 0$ are concurrent.
23. Find the equation of line having x-intercept -2 and y-intercept 3.
24. Find equation of circle with centre on origin and radius is $\frac{1}{2}$
25. Reduce the equation into standard form $x^2 + y^2 - 4x + 6y - 12 = 0$
26. What type of the circle is represented by $x^2 + y^2 + 2x - 4y + 8 = 0$
27. Define circle.

Section-II

Note: Attempt any three (3) questions.

3x8 = 24

- Q.2 Resolve into partial fraction (i) $\frac{x+4}{(x-2)^2(x+1)}$ (ii) $\frac{2x+5}{x^2+5x+6}$
- Q.3 (i) Find magnitude (modulus) and argument of $(4 + 7i)(3 - 2i)$.
(ii) Express the complex number in the polar form $Z = 2 + 2\sqrt{3}i$
- Q.4 (i) Minimize the expression $X = W\bar{Z}(W + Y) + WY(\bar{Z} + \bar{W})$
(ii) Prepare truth table for the Boolean Expression $AB + \bar{A}.\bar{B}$
- Q.5 (i) Find the points trisecting the join of $A(-1,4)$ & $B(6,2)$
(ii) Find the equation of the line which is perpendicular to the line $4x + 7y = 5$ and pass through $(-1,2)$
- Q.6 Find equation of circle passing through the points $(1,2)$, $(0, -1)$ and $(-1,1)$.
