

Kindly send me your key answers to our email id - padasalai.net@gamil.com

11. If number of columns and rows are not equal in a matrix then it is said to be a

- (a) diagonal matrix (b) rectangular matrix
(c) square matrix (d) identity matrix

12. For the given matrix $A = \begin{pmatrix} 1 & 5 & 7 & 9 \\ 5 & 7 & 2 & 1 \\ 2 & 4 & 8 & 2 \end{pmatrix}$ the order of matrix A^T

- a) 3×2 b) 2×3 c) 3×4 d) 4×3

13. Transpose of a column matrix is

- (a) unit matrix (b) diagonal matrix
(c) column matrix (d) row matrix

14. A square matrix in which elements in the leading diagonal are all "1" and rest are all zero is called

- a) unit matrix b) diagonal matrix c) zero matrix d) scalar matrix

PARTS-II [MARKS: 20]

Answer all the questions [Question number 28 is compulsory] 10x2=20

15. Solve $2x - 3y = 6$, $x + y = 1$

16. Find the LCM of $p^2 - 3p + 2$, $p^2 - 4$

17. Reduce the rational expressions to its lowest form $\frac{9x^2 + 81x}{x^3 + 8x^2 - 9x}$

18. Find the excluded values of the following expressions $\frac{t}{t^2 - 5t + 6}$

19. Simplify $\frac{x^3}{x-y} + \frac{y^3}{y-x}$

20. Write down the quadratic equation in general form for which sum and product of the roots are given below $\frac{5}{3}, 4$

21. Solve the quadratic equations by factorization method $4x^2 - 7x - 2 = 0$

22. Solve the quadratic equations by completing the square method $x^2 - 3x - 2 = 0$

23. Determine the nature of roots for the quadratic equations $9x^2 - 24x + 16 = 0$

24. Define diagonal Matrix

25. Construct a 3×3 matrix whose elements are $a_{ij} = i - j$

26. If $A = \begin{bmatrix} 0 & 4 & 9 \\ 8 & 3 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 3 & 8 \\ 1 & 4 & 9 \end{bmatrix}$ Find the value of $3A-9B$
27. Verify that $A^2=I$ when $A = \begin{bmatrix} 5 & -4 \\ 6 & -5 \end{bmatrix}$
28. Find the zeroes of the quadratic expression $x^2+8x+12$

PARTS-III [MARKS: 50]**Answer all the questions [Question number 42 is compulsory] 10x5=50**

29. Solve the system of linear equations in three variables

$$3x-2y+z=2, 2x+3y-z=5, x+y+z=6$$

30. Discuss the nature of solutions of the following system of equations

$$3x-y+z=1, 2x-y+2z=1, -x-y+z=2$$

31. Find the GCD of the polynomials x^3+x^2-x+2 and $2x^3-5x^2+5x-3$

32. Simplify $\frac{1}{x^2-5x+6} + \frac{1}{x^2-3x+2} - \frac{1}{x^2-8x+15}$

33. If $A = \frac{2x+1}{2x-1}$ and $B = \frac{2x-1}{2x+1}$ find $\frac{1}{A-B} - \frac{2B}{A^2-B^2}$

34. If $A = \frac{x}{x+1}$ and $B = \frac{1}{x+1}$ find $\frac{(A+B)^2+(A-B)^2}{A \div B} = \frac{2(x^2+1)}{x(x+1)^2}$

35. Find the square root of $(6x^2+x-1)(3x^2+2x-1)(2x^2+3x+1)$

36. Find the square root of the following polynomials by division method

$$\frac{x^2 - 10x + 27}{y^2} - \frac{10y}{y} + \frac{y^2}{x^2}$$

37. Find the values of m and n if the polynomials are perfect squares $x^4-8x^3+mx^2+nx+16$

38. A passenger train takes 1 hr more than an express train to travel a distance of 240 km from Chennai to Virudhachalam. The speed of passenger train is less than that of an express train by 20 km per hour. Find the average speed of both the trains.

39. If $A = \begin{bmatrix} 5 & 2 & 9 \\ 1 & 2 & 8 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 7 \\ 1 & 2 \\ 5 & -1 \end{bmatrix}$ show that $(AB)^T = B^T A^T$

40. If $A = \begin{bmatrix} 3 & 1 \end{bmatrix}$ show that $A^2-5A+7I_2=0$

41. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and $I_2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then show that $A^2 - (a + d)A = (bc - ad)I_2$

42. If α, β are the roots of the equation $3x^2 + 7x - 2 = 0$ find the values of

i) $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ ii) $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$

PARTS-IV [MARKS: 16]

Answer both questions

2x8=16

43. a) Draw a circle of radius 4 cm. At a point L on it draw a tangent to the circle using the alternate segment

(or)

b) Draw a triangle ABC of base $BC = 8$ cm, $\angle A = 60^\circ$ and the bisector of $\angle A$ meets BC at D such that $BD = 6$ cm.

44. a) Draw the graph of $y = 2x^2$ and hence use it to solve $2x^2 - x - 6 = 0$

(or)

b) Draw the graph of $y = x^2 - 4$ and hence use it to solve $x^2 - x - 12 = 0$

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