





13. If  $\text{adj}A = \begin{bmatrix} 0 & -2 & 0 \\ 6 & 2 & -6 \\ -3 & 0 & 6 \end{bmatrix}$ , find  $A^{-1}$ .

14. Find the inverse of matrix  $\begin{bmatrix} -2 & 7 \\ 1 & -3 \end{bmatrix}$ .

15. Find the rank of the matrix  $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 6 & 8 \\ -1 & -2 & -3 & -4 \end{bmatrix}$ .

$$4 \times 3 = 12$$

Part - c

III Answer Any 4 Questions:- (Q.No: 20 is compulsory).

16. Verify  $(AB)^{-1} = B^{-1}A^{-1}$  with  $A = \begin{bmatrix} 0 & -3 \\ 1 & 4 \end{bmatrix}$ ,  $B = \begin{bmatrix} -2 & -3 \\ 0 & -1 \end{bmatrix}$ .

17. Find the rank of the matrix  $\begin{bmatrix} 3 & -8 & 5 & 2 \\ 2 & -5 & 1 & 4 \\ -1 & 2 & 3 & -2 \end{bmatrix}$ .

18. Solve  $5x - 2y + 16 = 0$ ,  $x + 3y - 7 = 0$  by Cramer's rule.

19. Find a matrix A if  $\text{adj}A = \begin{bmatrix} 7 & 7 & -7 \\ -1 & 11 & 7 \\ 11 & 5 & 7 \end{bmatrix}$ .

20. Find the rank of the matrix  $\begin{bmatrix} 3 & 1 & -5 & -1 \\ 1 & -2 & 1 & -5 \\ 1 & 5 & -7 & 2 \end{bmatrix}$ .

Part - D

$$4 \times 5 = 20$$

IV Answer Any 4 Questions:-

21. Solve:  $2x + 3y - z = 9$ ,  $x + y + z = 9$ ,  $3x - y - z = -1$  by matrix inversion method.

22. A boy is walking along the path  $y = ax^2 + bx + c$  through the points  $(-6, 8)$ ,  $(-2, -12)$  and  $(3, 8)$ . He wants to meet his friend at  $P(7, 60)$ . Will he meet his friend? (Use Gaussian elimination method).

23. Find the value of k for which the equations  $kx - 2y + z = 1$ ,  $x - 2ky + z = -2$ ,  $x - 2y + kz = 1$  have

i) no solution ii) Unique solution iii) infinitely many solution.

24. Investigate for what values of  $\lambda$  and  $\mu$  the system of linear equations  $x + 2y + z = 7$ ,  $x + y + \lambda z = \mu$ ,  $x + 3y - 5z = 5$  has  
i) no solution ii) a unique solution iii) infinitely many solutions.

25. Determine the values of  $\lambda$  for which the following system of equations  $(3\lambda - 8)x + 3y + 3z = 0$ ,  $3x + (3\lambda - 8)y + 3z = 0$ ,  $3x + 3y + (3\lambda - 8)z = 0$  has a non-trivial solution.

... — All the Best — ...