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Questions:

5 Marks

1. If $A = \begin{bmatrix} 1 & 1 & 1 \\ 3 & 4 & 7 \\ 1 & -1 & 1 \end{bmatrix}$ verify that A (adj A) = (adj A) A = $|A| I_3$.

2. The cost of 2 Kg of Wheat and 1 Kg of Sugar is Rs.70. The cost of 1 Kg of Wheat and 1 Kg of Rice is Rs.70 The cost of 3 Kg of Wheat, 2 Kg of Sugar and 1 Kg of rice is Rs.170. Find the cost of per kg each item using matrix inversion method.

3. The data are about an economy of two industries A and B. The values are in crores of rupees.

Producer	User		Final demand	Total output
	A	B		
A	50	75	75	200
B	100	50	50	200

Find the output when the final demand changes to 300 for A and 600 for B.

4. If $A = \begin{bmatrix} 3 & 7 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 6 & 8 \\ 7 & 9 \end{bmatrix}$ then, verify that $(AB)^{-1} = B^{-1}A^{-1}$

5. Weekly expenditure in an office for three weeks is given as follows. Assuming that the salary in all the three weeks of different categories of staff did not vary, calculate the salary for each type of staff, using matrix inversion method.

Week	Number of employees			Total weekly Salary (in rupees)
	A	B	C	
1st week	4	2	3	4900
2nd week	3	3	2	4500
3rd week	4	3	4	5800

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3 Marks

6. Solve: $\begin{vmatrix} 2 & x & 3 \\ 4 & 1 & 6 \\ 1 & 2 & 7 \end{vmatrix} = 0$

7. Solve by matrix inversion method: 2x + 3y - 5 = 0, x - 2y + 1 = 0.

8. If $A = \begin{bmatrix} 2 & 3 \\ 1 & -6 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 4 \\ 1 & -2 \end{bmatrix}$, then verify adj (AB) = (adj B) (adj A).

2 Marks

9. The technology matrix of an economic system of two industries is $\begin{bmatrix} 0.50 & 0.30 \\ 0.41 & 0.33 \end{bmatrix}$. Test whether the system is viable as per Hawkins Simon conditions.

10. Find the inverse of each of the following matrices. $\begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}$

11. Show that $\begin{bmatrix} 8 & 2 \\ 4 & 3 \end{bmatrix}$ is non – singular.