

- Note: - 1) All questions are compulsory and carry equal marks.
 2) Figures to right indicate full marks to corresponding sub question.
 3) Use of simple calculator is allowed.

Q. 1. a) Write a note on arithmetic properties of matrices. (5)

b) If $A = \begin{bmatrix} 4 & -3 \\ 0 & 2 \end{bmatrix}$, $B = \begin{bmatrix} -1 & -2 & -3 \\ 3 & 2 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 4 & 6 & 5 \\ 2 & 1 & 0 \end{bmatrix}$
 Verify that $A \times (B+C) = (A \times B) + (A \times C)$ (5)

c) Find the inverse of following matrix using adjoin method. (5)

$$\begin{bmatrix} 7 & -3 & -3 \\ -1 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix}$$

OR

Q. 1. p) Define the terms. (5)

- i) Singular Matrix, ii) Equal Matrices, iii) Square Matrix,
 iv) Null Matrix, v) Row Matrix

q) Find x,y,z if $\begin{bmatrix} 5x+2 & 8 \\ 4 & 2 \\ 9 & z \end{bmatrix} + \begin{bmatrix} 5 & 2 \\ 3 & 2y+4 \\ -1 & 0 \end{bmatrix} = \begin{bmatrix} -13 & 10 \\ 7 & -8 \\ 8 & -2 \end{bmatrix}$ (5)

r) Solve the following equations simultaneously using matrix inversion method. (5)
 $3x + 2y + 4z = 2$, $x - 2y - z = 6$, $x + 2y - 6z = -2$

Q. 2 a) Write a note on variation. (5)

b) A, B, C invested Rs. 7,00,000/- , Rs. 5,00,000/- , Rs. 8,00,000 /- respectively in a business. At the end of the year C received Rs. 2,40,000/- as his share in the profit. Find A's and B's share in the profit. (5)

c) A particular sum of money amounts to Rs. 7,69,824/- in two years and Rs. 8,31,409.92/- in three years. Find the sum and compound interest rate. (5)

OR

Q. 2. p) Explain the relation between nominal and effective rate of interest. (5)

q) Two TV sets were sold at Rs. 9100/- each and thus a 30% profit was gained on one and 9% loss was incurred on the other. If both the TV sets are considered together find the percentage profit or loss.

r) Find the simple interest on Rs. 60,000/- from 20th June to 8th September 2006 at 14% per annum.

Q. 3 a) Write a note on future value and present value.

b) Compare project P and Q verifying their acceptability 16% per annum interest rate using NPV method.

Year	0	1	2	3	4
Cash Flow for Project P (Rs)	-80000	25000	30000	35000	40000
Cash Flow for Project Q(Rs)	-80000	21000	28000	35000	42000

e) Find the accumulated value after one year of an immediate annuity in which Rs. 50,000/- are invested every quarter at 12% per annum compounded quarterly.

OR

Q. 3. p) Write a note on perpetuity and its present value.

q) A loan of Rs. 1,00,000/- is to be returned in four equal monthly installments at 12% per annum. i) Calculate EMI using reducing balance method.

ii) Calculate for each month the break up of EMI into interest payment and principal repayment.

r) A person has to pay an institution Rs. 15,000/- at the end of 2 years and Rs. 10,000/- at the end of 3 years from now. If he decides to settle the payments now, what is the present value at interest compounded 8% per annum.

Q. 4 a) Explain briefly external economic indicator.

b) Fit a linear trend equation to the following data and estimate the sales for year 2005.

Year	2000	2001	2002	2003	2004
Sales (Rs. Lakhs)	100	120	140	160	180

c) The Reliable trading company furnishes you the following information: (5)

Year	2002	2003
Sales (Rs.)	8,10,000	10,26,000
Profit earned (Rs.)	21,600	64,800

You are required to compute the following assuming that the fixed Cost remains the same in both the period.

- Profit / Volume Ratio
- Fixed Cost
- The amount of Profit/Loss when Sales Rs. 6,48,000/-

OR

Q. 4. p) Write is the gross domestic product and related measures. (5)

q) The following table gives the repair and maintenance cost incurred in a cost center for various level of annual production. If the budget production at the cost center in the forthcoming year is 8500 unit, what would be the estimated repair and the maintenance cost. (5)

Output (000 Units)	Repairs and Maintenance Cost (Rs. in 000)
1	15
2	21
3	26
4	32
5	36
6	40
7	44
8	49

r) A factory requires 20000 units of an item per month, each costing Rs. 12/- The cost per order is Rs. 2000/- and the inventory carrying charges work out to be 25% the average inventory. Find out the economic order quantity and the number of orders per year. (5)