

- Q2.** 1. An amount of Rs.15,000 is invested at 8% p.a. compounded annually , calculate amount after 3 years and interest in 3rd year.
2. Find the accumulated value after 4 years of an immediate annuity of Rs.20,000p.a. with interest compounded at 6% p.a.
3. A manufacturer has put Rs.30,000 as initial cost and a variable cost of Rs.20 per unit for production of batteries. If each battery can be sold at Rs.40, find total cost, total revenue ,profit functions. Also find the number of batteries to be produced to achieve the break- even point of no pro.fit, no loss.
4. Find the value of the total cost and average cost at $x= 1, 4$ if the total cost function is
 (i) $C = 2+5.x+x^2$ (ii) $C = 10 + 3 x^2$
5. A car was brought at Rs.5,40,000. Find its resale price after 3 years by considering 8% depreciating p.a.
6. An amount of Rs.35,000 resulted into Rs.52,000 after a certain period, at 10%p.a. rate of simple interest. Find the period

Q3. 1. Solve the equations using Cramer's Rule

$$5x + 3y - 2z = 6 ; 3x + 3y - 4z = 2 ; 8x + 2y - 3z = 7$$

2. If $A = \begin{bmatrix} 3 & 7 \\ 1 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 5 \\ -1 & 0 \end{bmatrix}$

Find i) $(A + B)(A - B)$ ii) $A^2 - B^2$

3. If $A = \begin{bmatrix} 2 & 1 \\ 0 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 0 \\ 2 & 2 \end{bmatrix}$ find $A^2 + 2B - I$ and $5A + 3B$

4. Solve the equations using Cramer's Rule

$$5x - y + z = 5 ; 3x + y - z = 3 ; 2x + 3y + z = 10$$

5. .If $A = \begin{bmatrix} 2 & 5 \\ 1 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 7 \\ 6 & 3 \end{bmatrix}$ find $2A + 3B$ and $5A - B$

6. What is matrix and explain the types of matrices.

Q4. 1. The demand function is given by $p = 40 + 12D - 3D^2$ where p =price and D = demand. Find the total revenue , average revenue and marginal revenue when the demand is 5 units

2. Find maxima and minima for the function given below

$$f(x) = x^3 - 9x^2 + 24x + 7$$

3. Find dy/dx if 1) $y = e^x \cdot 5^x$ 2) $y = 7^x - 2x^{7/2} + 3\log x - x + 25$

4. The cost of manufacturing x items of a product is given by

$C = 2x^2 + 3x + 10$. Find the total cost , average cost , marginal cost and the marginal average cost if 10 items are manufactured

5. Find dy/dx if

i) $y = x^3 - \log x + e^x + 4^x + 25$

ii) $y = (x^2 - 2x + 5) / e^x$

6. Find maxima and minima of the function

$$f(x) = 2x^3 - 9x^2 - 24x + 11$$

Q5. 1. Prepare the forward difference table for the function $f(x) = x^3 + 3x + 1$

for $x = 0, 1, 2, 3, 4, 5$

2. Find d^2y/dx^2 if 1) $y = x^3 - 5x^2 + 10x + 30$ 2) $y = 4e^x + 2\log x - 3^x$

3. Explain Demand, Supply, Marginal cost and revenue, Elasticity of Demand

4. Prepare the forward difference table for the function $f(x) = x^3 + 2x - 3$

for $x = 0, 1, 2, 3, 4, 5$.

5. Find d^2y/dx^2 if 1) $y = x^4 + e^x + 5^x - \log x + 7$

2) $y = 5x^3 + 3^x - e^x$

6. Explain Cost, Revenue and Profit functions.