



Institute of Management
JK Lakshmipat University
Jaipur
END TERM EXAMINATION



BBA Sem- 2
MM: 50 Marks

Course: Business Mathematics
Time: 3 Hours
Subject code: BBA 203

Instructions: Attempt any three questions from Section A. Section B is compulsory.
Use of non-programmable scientific calculator is permitted.

Section A

Q1. Calculate producer surplus if the supply function is given by $P = Q^2 + 5Q$ and the market for the good is in equilibrium at price $P = \text{Rs. } 36$ per unit. Show it in a graph.
(10 marks)

Q2. The demand function of a particular good is given by $P = 80 - Q^2$, where P is price and Q represents the quantity.

- (a) Calculate the point elasticity of demand at $P = \text{Rs. } 44$ per unit.
- (b) Calculate the percentage change in demand in response to a 2% increase in price.
(10 marks)

Q3. Examine the continuity of the function $f(x) = \frac{1}{x-1}$ at

- (a) $x = 0$
- (b) $x = 1$.

Also, sketch the function.

(10 marks)

Q4. Find the inverse of the matrix

$$A = \begin{pmatrix} 1 & -2 & -1 \\ 2 & 3 & 1 \\ 0 & 5 & -2 \end{pmatrix}.$$

Also, verify your result.

(10 marks)

Q5. The total cost function of a good is given by $TC = 0.5Q^3 - 15Q^2 + 175Q + 1000$.

- (a) Find the average cost (AC) function, average variable cost (AVC) function, average fixed cost (AFC) function, and marginal cost (MC) function.
(05 marks)

- (b) Find the value of Q for which marginal cost is minimized.
(05 marks)

P.T.O.

Section B

Q6. Based on a study of the market and production conditions of a particular good, you have been able to conclude that the demand and total cost of the good are given by the following functions:

Demand function: $P = 60 - 5Q$

Total cost function: $TC = 50 + 5Q$

where Q represents the quantity of the good, P represents the price of the good and TC stands for total cost.

- (a) Find the maximum value of total revenue. (05 marks)
- (b) Find the break-even points. (05 marks)
- (c) Find the maximum value of profit. (05 marks)
- (d) Sketch the total revenue and total cost functions. Show clearly the break-even points and the levels of output at which total revenue and total profit are maximized. (05 marks)