# 2026

# Multi Disciplinary Course

# Business Mathematics

# Paper Code : MDC0201103N

# Time : 2 Hours

# Full Marks : 45

*(The figures in the margin indicate the full marks for the questions)*

1. Answer the following questions : 1×5=5

   a) Define diagonal matrix.

   b) Solve for $x \frac{1}{x-3} = 1$

   c) If CP = Rs. 80, SP = Rs. 100 calculate profit or loss.

   d) Find the fourth proportional to 18 men, 9 men and Rs. 3.00.

   e) If $f(x) = 2x^2 + 3x + 2$, find f(0)

2. Answer ***any five*** of the following questions : 2×5=10

   a) Solve : $x + y = 7$

   $5x + 12y = 7$

   b) Find the $15^{th}$ term of the series 2, 6, 10, 14...

   c) What will be the SI on Rs. 800 at 5% per year for 4 years?

   d) Evaluate : $\begin{vmatrix} 1 & 4 & 8 \\ -2 & 1 & 5 \\ -3 & 2 & 4 \end{vmatrix}$

   e) Find the value of $\lim_{x \to 2} \frac{x^2+2x-2}{2x+3}$

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f) Divide Rs. 3200 in the ratio 7 : 9.

g) In how many years will an annuity of Rs. 400 amount to Rs. 4064 at 3% p.a. compound interest.

h) A man spends 85% of his income. If his saving is Rs. 37.50. Find his salary?

i) Draw the graph of the inequolity $x \geq 3$.

j) Find the equation whose roots are $\frac{3}{7}$ and $\frac{-4}{5}$.

3. Answer ***any four*** of the following questions : 5×4=20

a) Insert 4 AM between 5 and 35.

b) In what time a sum money triples at 8% p.a. compound interest if interest is due annually log3 = 0.4771 and log1.08 = (0.0334)

c) Show that : $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 1+x & 1 \\ 1 & 1 & 1+y \end{vmatrix} = xy$

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d) Given the total cost function $C = Q^3 - 2Q^2 + 3Q + 35$. Find the marginal cost when $Q = 3$.

e) Evaluate the integrals : $\int (3x+2)^2 dx$

f) Solve : $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = 2\frac{1}{6}$

g) The sides of a triangular garden are in the ratio 5:7:8. If the perimeter of the garden be 810 m. Find the length of greatest side.

h) If $y = 2x + \frac{4}{x}$, prove that $\frac{x^2 d^2y}{dx^2} + \frac{x\, dy}{dx} - y = 0$



4. Answr ***any one*** of the following questions : 10

a) (i) A film produces x metric tonnes of output at a total cost

$(x) = \text{Rs.} \left(\frac{x^3}{10} - 6x^2 + 70x + 11\right)$

Determine in terms of x

Average Cost, Average variable cost and Average fixed cost.

(ii) Define demand function, supply function and cost function.

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b) (i) Solve by Cramer's rule :

$2x + 3y = 13$

$x + 7y = 23$

(ii) If $A = \begin{bmatrix} 0 & 1 & 2 \\ 2 & 3 & 4 \\ 4 & 5 & 6 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ find 3A – 4B.

c) (i) Find the sum of

$1 + 5 + 9 + 13 + \ldots\ldots$ to 25 terms.

(ii) The sum of three numbers in AP is 54 and the product of the extremes is 275. Find the numbers.

d) (i) If $f(x) = b\frac{x-a}{b-a} + a\frac{x-b}{a-b}$ then $f(a) + f(b) = f(a+b)$

(ii) Draw the graph of the function f(x)

$f(x) = 1$ when $x > 0$

$0$ when $x = 0$

$-1$ when $x < 0$

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