

[MURBM 203 / MPIBA 0203]
BBM/IMBA DEGREE EXAMINATION

II TRIMESTER

BUSINESS MATHEMATICS

(Effective from the admitted batch 2008–09)

Time: 3 Hours

Max.Marks: 60

Instructions: All parts of the unit must be answered in one place only.
Figures in the right hand margin indicate marks allotted.

SECTION-A

1. Answer any **FIVE** of the following
Each answer should not exceed one page. (5 x 4 = 20)
- a) Discuss various laws of Indices
 - b) If $A = \begin{bmatrix} 4 & 2 & 8 \\ 3 & 3 & 9 \end{bmatrix}$, $B = \begin{bmatrix} a & b & c \\ x & y & z \end{bmatrix}$ and $A+B = A$, then find B
 - c) Differentiate $e^x \log x$ with respect to x
 - d) Evaluate the following integral $\int e^{6x+4} dx$
 - e) If the marginal revenue function is $MR = 8 - 6q - 2q^2$ determine the revenue function
 - f) Find the minimum average cost if the cost function is given by $T = 36x - 10x^2 + 2x^3$
 - g) Find the 4th derivative of $\frac{1}{2x+3}$
 - h) Find $\int \frac{dx}{x^2 - 81}$

SECTION-B

Answer the following

UNIT-I

2. a) Show that $2+8+14+\dots+n$ terms $= 3x^2 - n$ by using mathematical Induction

b) Solve $\frac{2x-0.2}{4x+0.5} = \frac{0.2x-1.6}{0.4} - \frac{x}{2}$ 4

OR

c) Solve $\frac{x^2+2}{x} + \frac{8x}{x^2+2} = 6$ 4

d) A man has Rs.4,000/- invested, part at 5% and the remainder at 3% simple interest, the total income per year from these investments is Rs.168. How much does he has invested at each rate? 4

UNIT-II

3. a) If $A = \begin{bmatrix} 2 & -5 & 1 \\ 3 & 0 & -4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -2 & -3 \\ 0 & -1 & 5 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & 1 & -2 \\ 1 & -1 & -1 \end{bmatrix}$
find $2A+3B+4C$ 4

b) Find AB^T where $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 0 & -1 \\ 0 & 2 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ -1 & 0 & 2 \end{bmatrix}$ 4

OR

c) Find the inverse of A, where $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 4 & 9 \end{bmatrix}$ 4

d) Solve the following system of equations by using Cramer's Rule
 $3x + y - z = 5$, $x + 4y + 2z = 6$, $x + 3y + z = 4$ 4

UNIT-III

4. a) If $x = \sqrt{\left(\frac{1+x^2}{1-x^2}\right)}$, $|x| < 1$, then find $f^{-1} x$ 4

b) Find $\frac{dy}{dx} = \frac{x^3 \sqrt{2+3x}}{2+x} \cdot \frac{1}{1-x}$ 4

OR

c) Find the 4th derivative of $\frac{2}{x-1} \cdot \frac{1}{x-2}$ 4

d) Find the maximum and minimum value of the function
 $y = x^3 - 12x + 12$ 4

UNIT-IV

5. a) Find $\frac{\partial z}{\partial x}, \frac{\partial z}{\partial y}$ for $Z = \frac{1}{\sqrt{1+x+y^2}}$ 4

b) Find the first and second order partial derivatives of
 $U = 3x^2 + 7xy - 2y^2$ 4

OR

c) Find $\frac{\partial z}{\partial x}, \frac{\partial z}{\partial y}$ for $Z = 3xe^{y^2} + 4y$ 4

d) If $U = x^2 + 2xy + y^2$, find $\frac{\partial y}{\partial x} - \frac{\partial y}{\partial y}$ 4

UNIT-V

6. a) Evaluate $\int \left(\frac{x^6 - 1}{1 + x^2} \right) dx$ 4

b) Evaluate $\int_0^2 x \sqrt{2-x} dx$ 4

OR

c) Find $\int 1-x \cdot 4-3x \cdot 3+2x dx$ 4

d) Evaluate $\int_1^2 \frac{dx}{x+1} \cdot \frac{1}{x+2}$ 4