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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

MBA (Integrated)

SEM: I - THEORY EXAMINATION (2025 - 2026)

Subject: Business Mathematics

Time: 2.5 Hours

Max. Marks: 60

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

15

1. Attempt all parts:-

1-a. If x is a rational number, a and b ($a > b$) are whole numbers, then the value of $x^a \div x^b$ is....(CO1,K3) 1

- (a) x^{a-b}
- (b) $x^{a/b}$
- (c) x^{a+b}
- (d) x^{ab}

1-b. If A and B are sets and $A \cup B = A \cap B$, then (CO2,K2) 1

- (a) $A = \phi$
- (b) $B = \phi$
- (c) $A = B$
- (d) None of these.

1-c. If $f(x) = 3x^2 - 2$ then $f(0)$ (CO3,K3) 1

- (a) -2
- (b) 2
- (c) 3
- (d) 0

1-d. The vertical lines of numbers in a matrix are called.... (CO4, K1) 1

- (a) Rows
- (b) Columns
- (c) Column Matrix
- (d) Row Matrix

- 1-e. The value of $\frac{d}{dx}(e^x)$ at $x = 0$ (CO5,K3) 1
- (a) 1
 (b) 0
 (c) e
 (d) not defined

2. Attempt all parts:-

- 2.a. Find 20% of 15.125 liters.(CO1,K3) 2
- 2.b. Write a short note on finite set and Infinite set.(CO2,K1) 2
- 2.c. Find 6th term of GP: 10, 30, 90, 270 and 810 .(CO3,K3) 2
- 2.d. Define a scalar matrix with example.(CO4, K1) 2
- 2.e. Differentiate with respect to x: $y = x(3x^2 - 9)$.(CO5, K3) 2

SECTION-B 15

3. Answer any three of the following:-

- 3-a. The average age of three boys is 25 years and their ages are in the proportion 3 : 5 : 7. Find the age of the youngest boy .(CO1,K3) 5
- 3-b. If ${}^nC_r = 56$ and ${}^nP_r = 336$, find n and r. (CO2,K3) 5
- 3.c. A.P. are 2,4,6.....20 respectively ,Find the sum of series.. (CO3,K3) 5
- 3.d. If $A = \begin{bmatrix} 1 & 2 \\ 6 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 2 \\ 7 & 5 \end{bmatrix}$ 5
- Show that $(A+B)^T = A^T+B^T$ (CO4,K3)
- 3.e. Find the maximum and minimum value of the function: $y = x^3 - 6x^2 + 12x - 5$. (CO5, K3) 5

SECTION-C 30

4. Answer any one of the following:-

- 4-a. A sum of ₹20,000 is invested at 10% per annum compounded annually. Find the amount after 3 years.(CO1, K3) 6
- 4-b. A sum of ₹25,000 is borrowed at 10% per annum simple interest for 5 years. Find the interest and total amount. (CO1 , K3) 6

5. Answer any one of the following:-

- 5-a. If universal set $U = \{x : x \in N, x < 20\}$, $A = \{x : x \text{ is an odd number, less than } 20\}$ $B = \{x : x \text{ is a prime number, less than } 20\}$. Use the Venn diagram to find:
 (a) $A - B$ (b) B' (c) $A \cup B$ (d) $A \cap B$.(CO2,K3) 6
- 5-b. Find the number of ways a football team of 11 players can be selected from 16 players. Also find number of ways include 2 particular players. (CO2,K3) 6

6. Answer any one of the following:-

- 6-a. Find the sum of the series: (CO3,K3) 6
- a) $243 + 324 + 432 + \dots$ to n terms
 b) $1 - 3 + 9 - 27 + \dots$ to 2n terms

6-b. The sum of first four terms of an A.P. is 46 and the sum of last terms is 92. The first term is 12 find all numbers. (CO3,K3) 6

7. Answer any one of the following:-

7-a. Solve the following system of equations, (CO4,K3) 6

$$3x - 2y + 3z = 8; \quad 2x + y - z = 7; \quad 4x - 3y + 2z = 4.$$

7-b. 6

Prove that
$$\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = (a-b)(b-c)(c-a).$$
 (CO4, K3)

8. Answer any one of the following:-

8-a. Find the values of x for which the function $f(x) = x^5 - 5x^4 + 5x^3 - 1$ is maximum or minimum. (CO5, K3) 6

8-b. Integrate $4 + 7x^2 + \frac{3}{2}x^5$ with respect to x. (CO5,K3) 6

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