Printed page: 04 Subject Code: **AMIBA0102**

Roll No: | | | | | | | | | | | | | |

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MBA (Integrated)

SEM: I - THEORY EXAMINATION (2023-2024)

Subject: **Business Mathematics**

Time: 2Hrs.30 min Max. Marks:60

General Instructions:

IMP: Verify that you have received question paper with 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. Two numbers are in the ratio 7 : 9. If the sum of the numbers is 112, then the larger number is: (CO1) 1

a) 49

b) 72

c) 63

d) 42

1-b. Which of the following is correct?(CO2) 1

a) $n(A \cup B) = n(A) + n(B) + n(A \cap B)$

b) $n(A \cup B) = n(A) - n(B) - n(A \cap B)$

c) $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

d) None of these

1-c. In an Arithmetic Progression, if a = 28, d = -4, n = 7, then a_n is: (CO3) 1

a) 1

b) 4

c) -4

d) 3

1-d. Which of the following is not the property of transpose of a matrix? (CO4) 1

a) (A')'=A

b) (A+B)'=A'+B'

c) (AB)'=(BA)'

d) None of these

1-e. Intergral of e^{2x} with respect to x is: (CO5) 1

a) $2\ e^{2x}$

b) $0.5e^{2x}+c$

c) $0.5e^{2x}$

d) None of these

2. Attempt **all** parts:-

2.a. The price of cooking oil has increased by 25%. By what percent should a family reduce the consumption of cooking oil so as not to increase the expenditure in this account?(CO1) 2

2.b. In a family of 10 members, 7 of them like tea or coffee, 4 of them like tea and 5 of them like coffee. How many of them like both tea and coffee?(CO2) 2

2.c. If first term of a G.P. is 20 and common ratio is 4. Find the 5^{th} term.(CO3) 2

2.d. If $A = \begin{bmatrix} 3 & 4 \\ 2 & 1 \\ 1 & 0 \end{bmatrix} B = \begin{bmatrix} 1 & 3 \\ 2 & 2 \\ 3 & 1 \end{bmatrix}$,find 3A-2B. (CO4) 2

2.e If $\int \sec^2(7 - 4x)dx = a \tan(7 - 4x) + C$, then find the value of a. (CO5) 2

SECTION – B **15**

3. Answer any **three** of the following-

3-a. (i) Write 8^{2x+3} in the form of 2^y and express the relation between x and y.(CO1) 5

(ii) If $(x^2 - 4)^2 = 25$, Find the value of x.

3-b. A survey shows that 73% of Indian like apples, whereas 65% like oranges. What percentage of Indians like both apples and oranges? (CO2) 5

3-c. The sum of first three terms of a G.P. is 21/2 and their product is 27. Find first three term of the G.P. if the numbers are positive?(CO3) 5

3-d. If $A=\begin{bmatrix} 1 \\ -5 \\ 7 \end{bmatrix}$ and B=[3 2 -2] verify that $(AB)^T=B^TA^T$ where A^T denotes the transpose of A. (CO4) 5

3-e. If $f(x) = (x^2 - 5)^2$then find derivative of f(x) with respect to x.(CO5) 5

SECTION – C **30**

4. Answer any **one** of the following-

4-a. Sam borrowed some money from his friend at simple interest of 6% per annum. He returned his friend Rs. 15600. After how much time did Sam return the money if he borrowed Rs. 12000?(CO1) 6

4-b. If at same rate of interest, in 2 years, the simple interest is Rs. 40 and compound interest is Rs. 41, then what is the principal?(CO1) 6

5. Answer any **one** of the following- 6

5-a. If ${}^nP_r = 3024$ and ${}^nC_r = 126$ then find n and r.(CO2) 6

5-b. If A= {1,2,3,4,5,6,7} , B={3,5,7,9,11} and C= {2,4,6,8,10} Then find (i) AU(BUC) (ii) (AUB)∩ C.(CO2) 6

6. Answer any **one** of the following-

6-a. Compute the 16th term of HP if the 6th and 11th term of HP are 10 and 18, respectively.(CO3) 6

6-b. The sequence 28, 22, x, y, 4 is an AP. Find the values of x and y.(CO3) 6

7. Answer any **one** of the following-

7-a. By using the properties of determinants, Show that $\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} = (a - b)(b - c)(c - a)$. (CO4) 6

7-b. If $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$, Prove that $A^3 = A^{-1}$. (CO4) 6

8. Answer any **one** of the following-

8-a. Find the maximum and minimum values of the function $f(x) = x^3 - 2x^2 + x + 6$ (CO5) 6

8-b. The Marginal cost function of producing x units of a product is given by $MC = 3e^{.3x} + 5$. If the fixed cost is Rs 6050, find the total cost function.(CO5) 6