## NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

### (An Autonomous Institute Affiliated to AKTU, Lucknow)

### MBA (Integrated)

### SEM: I - CARRY OVER THEORY EXAMINATION -JUNE 2023

### 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.*

<div align="center">SECTION A                                                      15</div>

**1. Attempt all parts:-**

1-a.        3430000 in standard form is          (CO1)                                                    1

(a) $3.43 \times 10^6$

(b) $3.43 \times 10^4$

(c) $3.43 \times 10^2$

(d) $3.43 \times 10^0$

1-b.        If A = {1,4,6}, B = {3,6} and C = {3,4,5} then A∩(BUC) is        (CO2)              1

(a) {1,3,4,5,6}

(b) {3,4,5,6}

(c) {4,6}

(d) None of these

1-c.        Which among the following is exponential equation     (CO3)                            1

(a) Y = 2x+1

(b) Y = $x^3$

(c) Y = $x^2$ +1

(d) $Y = a^x$

1-d.      Let A and B are any two matrix then $(\mathbf{AB})^T$ = ?      (CO4)      1

(a) $(\mathbf{A})^T \ (\mathbf{B})^T$

(b) $(\mathbf{B})^T \ (\mathbf{A})^T$

(c) AB

(d) BA

1-e.      Find the value of $\int 4x^3 dx$.    (CO5)      1

(a) $12x^2 + c$

(b) $x^4$

(c) 4x4

(d) None of these

## 2. Attempt all parts:-

2.a.      Which ratio is larger 10 : 21 or 21 : 93?      (CO1)      2

2.b.      If set A = {3, 4, 5, 6} and set B = {2, 4, 6, 8};      (CO2)      2
Find: (A –B)

2.c.      Define logarithm function with example.      (CO3)      2

2.d.      State commutative law of matrix addition.      (CO4)      2

2.e.      Differentiate $f(x) = 6x^3 – 9x + 4$ with respect to x.      **(CO5)**      2

**SECTION B**      **15**

## 3. Answer any <u>three</u> of the following:-

3-a.      At what rate of compound interest per annum will a sum of Rs. 1200 become      5
Rs.1348.32 in 2 years?    (CO1)

3-b.      In a group of 60 people, 27 like cold drinks and 42 like hot drinks and each      5
person like at least one of the two drinks. How many like both coffee and tea?
(CO2)

3.c.      Three numbers are in A.P. and their sum is 18. If 2, 4, 11 be added to them      5
respectively , they form a G.P. find the numbers. (CO3)

3.d.      If A = $\begin{bmatrix} 3 & -2 \\ 4 & -2 \end{bmatrix}$ and I = $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$      (CO4)      5

Find K, So that $A^2$ = KA – 2I

3.e.      Define the marginal cost function. Elaborate with example.   (CO5)      5

**SECTION C**      **30**

## 4. Answer any <u>one</u> of the following:-

| 4-a. | The cost of a table and a chair are in the ratio of 5 : 7. If the cost of chair and table is increased by 20% and 10% respectively, then what will be the new ratio?   (CO1) | 6 |
|---|---|---|
| 4-b. | The monthly income of a person was Rs 13500 and his monthly expenditure was Rs 9000. Next year, his income increased by 14% and his expenditure by 7%. Find the percentage increase in his savings.    (CO1) | 6 |

**5. Answer any <u>one</u> of the following:-**

| 5-a. | How many words can be formed from the letters of the word 'SIGNATURE' so that the vowels always come together? (CO2) | 6 |
|---|---|---|
| 5-b. | A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected, if the team has     (CO2)<br>(i) no girls<br>(ii) at least one boy and one girl | 6 |

**6. Answer any <u>one</u> of the following:-**

| 6-a. | The sum of first four terms of an A.P.  is 56 and the sum of last terms is 112. The first term is 11 find all numbers.    (CO3) | 6 |
|---|---|---|
| 6-b. | Determine the 5th term and the 49th term of the Harmonic Progression 6, 4, 3,... (CO3) | 6 |

**7. Answer any <u>one</u> of the following:-**

| 7-a. | Prove that the matrix A is invertible if and only if A is non singular matrix.  (CO4) | 6 |
|---|---|---|
| 7-b. | Using matrix inversion method, solve the system of equations for x, y and z.  (CO4)<br>$x + y + z = 5; 2x + y - z =2; 2x - y + z =2$ | 6 |

**8. Answer any <u>one</u> of the following:-**

| 8-a. | Show that the function $f(x) = 12x^5 - 45x^4 + 40x^3 + 5$  has neither a maximum nor a minimum.  (CO5) | 6 |
|---|---|---|
| 8-b. | If a manufacturer's total cost function is C = $0.1x^2 + 3$, find  (CO50<br>a) the average cost function<br>b) the marginal cost function, and<br>c)  the marginal cost when 4 units are produced. Interpret the result. | 6 |