

INTERNATIONAL ISLAMIC UNIVERSITY CHITTAGONG

Department of Business Administration
BBA Midterm Examination, Autumn-2023

Course Title: **Business Mathematics** Course Code: **MATH-1202**

Time: 1 Hour 30 minutes

Marks-30

[Answer the following questions. All parts of a question answer serially]

Q.N.

Description of questions

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|------|--|------------|------------|--------------|
| | | Mar | HO/ | CLO's |
| 1.a) | Define Transpose matrix and Non-singular matrix with example. | ks | LO | |
| b) | If $N = \begin{pmatrix} 3 & 5 & 3 \\ 4 & 0 & -4 \\ -1 & 2 & -3 \end{pmatrix}$, evaluate $N^2 + 2N - 5I$. | 2 | LO | CLO2 |
| c) | A manufacturer produces three types of products A, B, C which he sells in three different markets I, II, III. Annual sales volumes (in '00) are given below: | 4 | HO | CLO3 |
| | | 4 | HO | CLO3 |

	A	B	C
I	3	2	5
II	6	4	1
III	5	3	4

If selling price of the products A, B and C are Tk. 15, Tk.25 and Tk.18 respectively, calculate the total revenue of the individual market.

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|------|--|---|----|------|
| | | 1 | LO | CLO2 |
| 2.a) | Write down the matrix form linear equations with example. | | | |
| b) | Find the inverse of matrix $A = \begin{bmatrix} 3 & 2 & -1 \\ 1 & 0 & 5 \\ 4 & -1 & 7 \end{bmatrix}$ | 4 | HO | CLO3 |
| c) | To control a certain crop of disease it is necessary to use 72 units of chemical A, 37 units of chemical B, 44 units of chemical C. One barrel of spray X contains 4 unit of A, 2 units of B, 3 units of C. One barrel of spray Y contains 7 units of A, 3 units of B, 2 units of C. One barrel of spray Z contains 1 unit of A, 2 units of B, 5 units of C. How many barrels of each type of spray should be used to control the disease? | 5 | HO | CLO3 |
| 3.a) | What is Input and Output based on production? Write some assumptions of Input-Output analysis. | 3 | LO | CLO2 |
| b) | The following table summarize the two industry economy of a year: | 7 | HO | CLO3 |

Industry	1	2	Final Consumption('000)
1	0.5	0.4	200
2	0.3	0.2	300

- i) Find the total output level for the industries.
- ii) Determine the total primary input for all industries.
- iii) Determine the total input for 2nd industry.
- iv) Write the economic meaning of 0.5, 0.4 and 300.

OR

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|----|--|---|----|------|
| | | 2 | LO | CLO2 |
| a) | Discuss different types of market equilibrium. | | | |
| b) | Evaluate the equilibrium price and quantity for the substitute products X and Y in two related markets:
$D_1 = 18 - 3P_1 + P_2$ $D_2 = 12 + P_1 - 2P_2$
$S_1 = -1 + 5P_1$ $S_2 = -5 + 6P_2$
Write a comment about the above market. | 4 | HO | CLO3 |
| c) | An income determination model is given below: $Y = C + I + G$, $C = a + b(Y - T_0)$, $G = gY$, $I = 250$, $a = 20$, $b = 0.3$, $g = 0.15$ and $T_0 = 190$. | 4 | HO | CLO3 |
| | (i) Write down the endogenous variable(s) of the above model. (ii) Determine equilibrium level of National income and Consumption expenditure of the model. | | | |