BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: IMSc **SEMESTER : I**
BRANCH: CQEDS **SESSION : MO/2025**

SUBJECT: ED25105 INTRO. TO ECONOMICS & ESSENTIAL MATHEMATICS

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1	$Given\ A = \begin{bmatrix} 2 & 8 \\ 3 & 0 \\ 5 & 1 \end{bmatrix}, B = \begin{bmatrix} 2 & 0 \\ 3 & 8 \end{bmatrix}, and\ C = \begin{bmatrix} 7 & 2 \\ 6 & 3 \end{bmatrix}$		1	4,5
Q.1(a)	Is *AB* defined? If so, Calculate *AB*. Can you calculate *BA*? Why?	[4]		
Q.1(b)	Is *BC* defined? Calculate *BC*. Is *CB* defined? If so, calculate *CB*. Is it true that *BC* = *CB*.	[6]		
Q.2	A consumer has the utility function: $U(X,Y) = X^{0.5}\,Y^{0.5}$ Subject to a budget constraint: $P_x X + P_y Y = M$ where, The prices of goods are $P_x = 4$, $P_y = 2$, and the consumer's income is M = 80. a) Write the lagrangian function. b) Find the optimal level of purchase of goods X and Y.	[10]	2	4,5
Q.3	Classify each of the following statements as positive or normative. Explain. a) Society faces a short-run trade-off between inflation and unemployment. b) A reduction in the rate of money growth will reduce the rate of inflation. c) The Federal Reserve should reduce the rate of money growth. d) Society ought to require welfare recipients to look for jobs. e) Lower tax rates encourage more work and more saving.	[10]	3	2,4
Q.4(a)	Draw and briefly explain the circular flow of income diagram.	[5]	4	1,2
Q.4(b)	Briefly explain the principles of individual decision making.	[5]	4	1,2
Q.5	The market demand and supply for good X are given by: $Q_d = 60 - 2P$ $Q_s = 10 + P$ a) Find the equilibrium price and quantity. b) Compute the consumer surplus at equilibrium. c) Compute the producer surplus at equilibrium. d) Draw a neatly labelled diagram showing demand, supply, equilibrium, consumer surplus and producer surplus.	[10]	5	5

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