



**M.A. II Semester Degree Examination, Sept./Oct. - 2024**

**ECONOMICS**

**Mathematics for Economics**

**(NEP)**

Time : 3 Hours

Maximum Marks : 70

**Note :** Answer **any five** of the following questions, each question carries **equal** Marks.  
Question No. 2 is **compulsory**.

1. Explain the applications of mathematical techniques in economic analysis. 14
2. Explain the laws of matrix operations with suitable examples. 14
3. Solve the following equations using Cramer's rule : 14  

$$x + 2y + z = 8$$

$$2x + 3y + 2z = 14$$

$$3x + 2y + 2z = 13$$
4. Cost function of a firm is given as  $TC = q^3 - 4q^2 + 4q$ . Minimize the average cost 14  
and check whether average cost is equal to marginal cost.
5. Given the demand and supply functions find the consumer's and producer's 14  
surplus.  

$$P = 30 - 2x$$

$$2P = 5 + x$$
6. (a) Find the inverse for the following matrix : 7  

$$A = \begin{bmatrix} 3 & 5 & 8 \\ 4 & 1 & 3 \\ 6 & 2 & 4 \end{bmatrix}$$
- (b) Explain the properties of determinants. 7
7. (a) Explain the rules of differentiation. 7
- (b) Explain the applications of integral calculus to economic analysis. 7



8. (a) Multiply the following matrix  $A \times B$ . 5

$$A = \begin{bmatrix} 6 & 4 & 2 \\ 8 & 1 & 3 \\ 1 & 3 & 5 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 3 & 6 \\ 5 & 7 & 2 \\ 9 & 1 & 3 \end{bmatrix}$$

- (b) Find the marginal utility at  $x=2$  and  $y=3$  for the given total utility function 5  
 $U = 2x^3y + 3xy^2 + 3x + 3y$ .
- (c) State the conditions of maxima and minima. 4

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