



M.A. II Semester Degree Examination, October - 2023

ECONOMICS

Mathematical Economics

(NEP)

Time : 3 Hours

Maximum Marks : 70

Note : Answer **any five** questions with question No. 1 is **compulsory**.

1. (a) Discuss the important properties of determinants. 10
- (b) Find minor and co-factor for all the elements $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ 4
2. If $A = \begin{bmatrix} 1 & 3 & 4 \\ 3 & -1 & 6 \\ -1 & 5 & 1 \end{bmatrix}$ prove that $(A')^{-1} = (A^{-1})'$ 14
3. Solve the following system of equations by Cramer's rule. 14
- $$\begin{aligned} 3x + y - z &= 5 \\ x - 4y - 2z &= 6 \\ 2x + 3y + z &= 4 \end{aligned}$$
4. (a) List out the laws on set operations. 7
- (b) If $A = \{1, 2, 3, 4, 5\}$ $B = \{1, 4, 5, 6\}$ $C = \{7, 8, 9, 4, 5\}$ verify that $(A \cup B) \cup C = A \cup (B \cup C)$ 7
5. (a) State the conditions for maxima, minima and for point of inflexion. 4
- (b) Find the maximum and minimum value of $u = 2x^2 + 3y^2 + 9 - 4x - 5y - 3xy$ 10
6. (a) List out the rule of differentiation. 7
- (b) Evaluate $\frac{dy}{dx}$ if $y = (8x^2 + 4x)(2x + 9)$ 7
7. (a) Describe the important rule of integration. 6
- (b) Evaluate $\int 4x^2(x^3 + 5)^3 dx$. 8



8. (a) Given $A = \begin{bmatrix} 1 & 3 & 4 \\ 2 & 4 & 8 \\ 3 & -2 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 4 & 0 & 0 \\ 1 & 3 & 5 \\ 0 & 1 & 6 \end{bmatrix}$ find $A+B$ and $A-B$. **5**
- (b) Determine the domain and range of the relation and depict the relation by arrow diagram. **5**
 $R = \{(-2, 3), (-1, 5), (0, 7), (1, 9), (2, 11), (3, 13)\}$
- (c) Evaluate $\int (3x^2 - 5x + 1)dx$. **4**

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