

21-3-17



Doon University, Dehradun  
Mid-term Examination, 2017  
School of Social Science  
MSc Semester – 2<sup>nd</sup> (Economics)  
Course – SSEI -152  
Mathematical Economics-II

Time Allowed: 2hrs

Maximum Marks: 30

Section - A

(5x2 = 10 Marks)

Attempt all questions

1. Find x and y if

$$\begin{bmatrix} x+y & 2 \\ 1 & x-y \end{bmatrix} = \begin{bmatrix} 3 & 2 \\ 1 & 7 \end{bmatrix}$$

2. If  $A = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & -1 \\ -3 & 2 \end{bmatrix}$ , find AB and BA. Is AB=BA?  
3. Find  $h'(x)$  when  $h(x) = (x^2 - x) \cdot (5x^4 + x^2)$   
4. Find  $y'$  when  $y = \sqrt{x^2 + 1}$   
5. Find  $\int (4x^3 + 3x^2 - 2x + 5)dx$

Section - B

Attempt any two questions

(2x4=8 Marks)

1. Three persons buy cold drinks of different brands A,B,C. The first person buys 12 bottles of A, 5 bottles of B, 3 bottles of C. The second person buys 4 bottles of A, 6 bottles of B, and 10 bottles of C. The third person buys 6 bottles of A, 7 bottles of B and 9 bottles of C. Represent the information in the form of a matrix. If each bottle of brand A costs Rs. 4, each bottle of B costs Rs.5 and each bottle of C costs Rs. 6 then using matrix operations find the total sum of money spent individually by the three persons for the purchase of cold drinks.

2. Show that

$$\begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix} = abc - af^2 - bg^2 - ch^2 + 2fgh$$

3. Find  $\frac{\partial^2 u}{\partial x^2}, \frac{\partial^2 u}{\partial x \partial y}, \frac{\partial^2 u}{\partial y \partial x}, \frac{\partial^2 u}{\partial y^2}$  for the function:

$$u = ax^3 + hx^2y + by^3$$

Section-C

Attempt any **Two** questions

(2x6=12marks)

1. Determine the consumer surplus and producer surplus under pure competition for the demand function  $p=36-x^2$  and supply function  $p=6+\frac{x^2}{4}$ , where  $p$  is the price and  $x$  is quantity.

2. Differentiate:

(a)  $\frac{1}{\sqrt{x^2+a^2}+\sqrt{x^2+b^2}}$  w.r.t.  $x$

(b)  $\frac{(x+1)(2x-1)}{(x-3)}$

3. Solve the following linear equations using determinants:

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

$$x + y + z = 1$$

$$x - 2y - 3z = 4$$