Himachal Pradesh University, Summer Hill, Shimla-5
International Centre for Distance Education & Open Learning (ICDEOL)
Department of Economics

MA (Economics) I Semester
Course–III: Elementary Mathematical Economics

Maximum Marks – 20
Last of Submission: March 15, 2022

Note: Attempt any four questions out of following:

Q1. (a) if U = {1,2,3,4,5,6,7,8,9,10} be the universal set, A = {2,3,5,8,10} and B= {1,3,5,7,9} then verify that $(AUB)^C = A^C \cap B^C$

(b) If the law of demand is $q = \frac{20}{p+1}$, find the price elasticity of demand when p = 3

Q2. (a) Verify the Euler's Theorem for $U= X^2 \log\frac{Y}{x}$

(b) If the production function is $q=2L^{3/4} K^{1/4}$

then find marginal productivity of labour and capital

Q3. (a) Evaluate $\int (3x+2) / (x+1)^2 (x-2)$

(b) If the demand function is $p=25–3X–3X^2$. Find the consumer's surplus when p=7

Q4. (a) Find the value of X such that

$$[1 \quad 1 \quad X] \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 1 & 0 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = 0$$

(b) The equilibrium condition for the two goods is given by

$5P_1+2P_2 = 15$ and $–P_1 –8P_2 =16$. Find the equilibrium price by Crammer's rule.

Q5. (a) Discuss the uses of Linear Programming Problem (LPP) in the planning models.

(b) Solve the following LPP by simplex method

Maximize z = 25x + 35y

Subject to $2x + 3y \leq 15$
$3x + y \leq 13$
and $x,y \geq 0$

Q6 (a) State and explain the properties of determinants

(b) Find the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 5 \\ 1 & 3 & 4 \end{bmatrix}$