Q. 1 Differentiate among variables, constants and parameters also define endogenous as well as exogenous variables? (20)

Q. 2 Consider the market model

\[ Q_d = 10 - 2P \]
\[ Q_s = 6P - 1 \]

a) Calculate the equilibrium price and quantity?
b) Suppose Govt impose Rs 10 per unit tax on consumers. What will be the equilibrium price and quantity after tax?

Q. 3 a) Define matrix, vector and scalar? (20)
b) Using Cramer’s rule find the value of ‘x’, ‘y’ and ‘z’

\[ 2x + 3y + z = 1 \]
\[ 5x + y + 2z = 0 \]
\[ 3x + 4y + 6z = 5 \]

Q. 4 Write a detailed note on Jacobian determinants. Also give economic interpretation of total differentiation? (20)

Q. 5 Find the derivatives of the following:

a) \[ Y = (9x^2 + 1)(3x + 2) \]
b) \[ Y = (x^2 + 3)(x^{-1} - 1) \]
Q. 1 Discuss in detail the rules of differentiation. Also discuss the importance of differentiation in economics? (20)

Q. 2 Explain with the help of examples the applications of exponential and logarithmic functions in economics? (20)

Q. 3 Explain with the help of example and diagram’s the differences between concave function and strictly concave functions, convex functions and strictly convex functions? (20)

Q. 4 Describe the method of finding characteristics roots of the quadratic equation? (20)

Q. 5 Maximize the utility function:

\[ U = X_1 + X_2 \]

Subject to \( Y = P_1X_1 + P_2X_2 \)

Also find out demand functions.

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