JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-2 EXAMINATION- 2025

B.Tech- VI Semester (CSE/IT/ECE/CE/BT/BI)

COURSE CODE (CREDITS): 23B1WHS631 (3) MAX. MARKS: 25

COURSE NAME: Engineering Economics

COURSE INSTRUCTORS: Dr. Bilal Khan (BLK) MAX. TIME: 1 Hour 30 Min

Note: *(a) All questions are compulsory.*

(b) Use of calculators is allowed.

(c) Question no. 5 is a choice-based question. You are required to attempt any one option only.

Q. No	Question	CO	Marks
1.	For the given Cobb-Doughlas production function of a firm: $Q = f(L, K) = AL^{\propto}K^{\beta}$ **Prove that:** (a) Elasticity of Factor Substitution (σ) is 1. (b) Marginal Product of Labour (MP_L) and Marginal Product of Capital (MP_K) are homogenous of degree 0, respectively.	CO2	[2+3=5]
2.	Using langrage multiplier, find the degree of homogeneity for the following production functions, and mention whether they exhibit increasing, decreasing or constant returns to scale: (a) $Q = f(x, y) = 2x^2y + xy^2 - y^3$ (b) $Q = f(x, y) = \frac{x}{y^2 + \sqrt{x^4 + y^4}}$ (c) $Q = f(L, K, T) = \frac{LK^3}{T} + 3LT$	CO2	1X3=3
3.	Suppose, the production function for a firm is given as Q (L, K) = $11L^{0.9}K^{0.1}$. The price of labour input (L) is \$200 and the price of capital input (K) is \$400. Using the langrage function method, find the cost-minimizing combination of labour and capital to produce 19000 units of output. What will be the minimum total cost (C) of production for the firm?	CO2	5
4.	The demand and supply functions for a commodity are as follows: $Q_D = 2400 - 8P$ $Q_S = 30 + 4P$ Calculate the equilibrium price and quantity. Suppose a price ceiling of \$180.5 is imposed on the commodity, what will be the consumer surplus (CS), producer surplus (PS) before and after the imposition of price ceiling and dead-weight loss (DWL). Also show the differences in CS, PS and DWL with the help of diagram	CO2	7

	after price ceiling is imposed.		
5.	Write short notes on (with diagram): (a) Relationship between marginal cost (MC), average total cost (ATC) and average variable cost (AVC) (b) Three stages of the law of variable proportion (c) Leontief Isoquant **OR** The demand and supply functions for a commodity are as follows: $Q_D = 360 - 6P$ $Q_S = 40 + 2P$ Calculate the equilibrium price and quantity. Suppose a price floor of \$60 is imposed on the commodity, what will be the consumer surplus (CS) and producer surplus (PS) before and after the imposition of price floor. Also show the differences in CS, PS with the help of diagram after price floor is imposed.	CO3	5