UNIVERSITY OF ZAMBIA
DEPARTMENT OF ECONOMICS
ECN 1115 TUTORIAL SHEET 4 - 2024

PART 0NE (PRODUCTION THEORY)

QUESTION ONE

a. What are isoquants? Why does an isoquant slope downwards? Why can't isoquant cut each other? Why are they convex to the origin?

b. What is meant by marginal rate of technical substitution between factors (MRTS$_{LK}$)? How is it related to marginal product of factors? Why does the MRTS$_{LK}$ of labor for capital diminishes as more labor is used by substituting capital?

c. A production function is given by $Q = KL$, where K and L are the inputs used by firm and Q represents output.

    i. Check the returns to scale for this production function

    ii. Draw the isoquant map

    iii. Calculate the MRTSLK. What will the expansion path look like?

d. You are given the following production: $Q = L^{0.75}K^{0.25}$

    i. Find the marginal product of labor

    ii. If the fixed quantity of capital in the short run equals 10,000 units, what is the short run production function?

    iii. Show that the marginal product of labor (MPL) is less than the average product of labor in the short run production function in (ii) above.

QUESTION TWO

a. You have the information shown in the accompanying table about a firm's costs. Complete the missing data.

OUTPUT	TOTAL COST	MARGINAL COST	AVERAGE TOTAL COST	AVERAGE VARIABLE COST	FIXED COST
0	35	-	-	-	
1		25			
2		17			
3		20			
4		30			
5		36			

b. Graphically illustrate the three stages of the short run production function clearing showing the relationship between Total product, Marginal product and average product. Why does it not make economic sense to produce in stage 1 and 3?

PART TWO (MARKET STRUCTURES)

QUESTION ONE

a. Why is a firm in a perfectly competitive market said to be a 'price taker'? Distinguish between the short-run and long-run equilibrium in perfect competition.

b. Why is it possible for a monopolist to earn supernormal profit in the long run?

QUESTION TWO

a. Describe the factors that drive profits to zero in perfectly competitive markets in the long run. Explain carefully the incentives that drive the market to a long run equilibrium.

b. Why would a firm choose to operate at a loss in the short run?

c. Draw a graph for a perfectly competitive market, specifically showing the firm making super normal profits, normal profits as well as loses in the short run.

QUESTION THREE

Consider an inverse market demand function faced by a monopoly: $P = 100 - Q$

a. Draw and correctly label a diagram showing this demand curve

b. On this same diagram, draw and clearly label the marginal revenue curve derived from the demand function. Clearly indicate at least two points.

c. Given that the total cost is given by TC = 50Q, find the average total cost and the marginal cost showing the correct curve on the diagram.

d. Calculate the deadweight loss in the market and illustrate this clearly on the diagram drawn in **a.)** above.