Indian Institute of Technology Kharagpur

Date: _____FN/AN Time: 3 hrs Full Marks: 50 No of Students: 447

Spring End-Sem. Exam, 2018 Subject: Economics Subject No: HS20001

Instructions: Answer one question at one place only. All questions are compulsory.

1. a) How is price-elasticity of demand different from cross-elasticity of demand? Write two uses of the concepts of elasticity in demand analysis. The average revenue (AR) function of a firm is given as AR = 100 – 3Q, where Q is the output. Find out the price elasticity of demand when Q = 5. 1+1+2

b) Mention at least three (03) basic assumptions of a production function. State the law of diminishing marginal returns. A firm faces the short-run production function as $Q = -2L^3 + 16L^2$, where Q is the output and L is the labour employed. Calculate the level of L when the average product is maximum. Also, show that the marginal product is equal to the average product when the average product attains a maximum. 1.5+1.5+2

c) Distinguish between explicit cost and implicit cost. Given the total cost function

$$TC = Q^3 - 7Q^2 + 20Q + 16$$

where TC is the total cost and Q is the output produced.

Find (i) Average variable cost function and show that when average variable cost is minimum, average variable cost = marginal cost.

(ii) Derive the average cost function and check that when Q = 4, the average cost is minimum and at that level of output, marginal cost (MC) = average cost (AC).

2+2+2

d) Discuss the properties of isoquants. 2

2. a) Define demand multiplier and explain how the value of the multiplier depends on the slopes of all demand functions and not on the consumption demand function only. What could be possible leakages of multiplier for an economy? 2+1

b) Suppose consumption function C = 30 + 0.5Y and investment function I = 50 + 0.3Y (Y represents income of an economy). Derive equilibrium income and the value of the multiplier. If the economy in question increases autonomous investment to 100, derive new equilibrium income and show the process of multiplier under the following two different conditions:

i) Rise in investment is once-over type.

ii) Rise in investment is permanent.

Present the process of multiplier with the help of appropriate tables and algebraic explanations. Interpret the results. 2.5+2.5+1

c) L & T is considering investing in two alternative road infrastructure projects, A and B, of the Government of India. The total initial capital requirement for project A is INR 80,000 Crore and that for project B is INR 50,000 Crore. The weighted average cost of raising the capital from the market is estimated to be 10% per annum. Net cash flows are expected to be as given below:

Year	Annual Net Cash Flows (INR in Crore)	
	A	B
First	20000	20000
Second	25000	30000
Third	30000	45000
Fourth	40000	25000
Fifth	35000	20000

Applying the payback period method, find out which of the two proposals is to be considered. Estimate NPV and suggest which project is worth-considering. If the company aims to ensure that the rate of profitability should be maximum, which one would it like to select finally? 1+2+2

b) Define perfect competition and present its characteristics. How does a firm attain equilibrium under this market form?

Suppose a manufacturer of fishing nets is faced with the following cost function:

$C = 150Q + 0.0025Q^2$

Where Q is the quantity of output.

The firm in question is a price taker and hence the going price for the firm is INR 175 per piece. Find the profit maximizing quantity and the amount of profit the firm can earn. 2+2

3. a) What is Human Development? Explain the concepts of capability and functioning using suitable mathematical notations. 1+4

b) Differentiate between Paasche Price Index and Laspeyres Price Index in economic terms? Given the data set calculate Fisher's Price index. 2+3

Goods and Service	Base Year		Current Year	
	Expenditure (INR)	Price per unit (INR)	Quantity (Units)	Expenditure (INR)
Food items	2000	4	1000	2000
Industrial goods	2400	6	1500	4500
Services	6000	8	8000	32000

c) Discuss identification and aggregation problems in the context of measuring poverty. 3+2