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Indian Institute of Technology Kharagpur

Date: _____FN/AN Time: 3 hrs Full Marks: 50 No. of Students: 398

Spring End-Sem. Exam, 2013 Subject: Economics Subject No: HS20001

1. a) Define production and differentiate fixed input from variable input. Discuss the law of diminishing marginal returns in the context of a production function with one variable input. Prove that the exponents α and β in a Cobb-Douglas Production Function represent the elasticities of output relating to respective inputs. 2 + 2 + 2

b) Show the relationship between Short-run Average Cost (SAC) and Short-run Marginal Cost (SMC) and prove that SMC curve passes through the SAC curve at its minimum point. If the total cost function of an inkjet printer is $C_{ij} = 5000 + 1.8q$ and the total cost function of a laser printer is $C_l = 8000 + 1.5q$, where q represents the total number of pages printed, which one should a firm buy and why? 2 + 2

c) Write short notes on (any three) of the following: 2 × 3

i. Determinants of price-elasticity of demand

ii. Ridge line and Economic region of production

iii. Laws of returns to scale

iv. Private and Social costs

2. a) How is investment multiplier derived? An economy has the following consumption and investment demand functions respectively:

$$C = 25 + 0.6Y$$

$$I = 5 + 0.2Y$$

Find the equilibrium income and the value of the multiplier (*Treat multiplier as the reciprocal of marginal demand propensities*). If autonomous investment increases by 20, present the operation of multiplier under the assumption that (i) investment is once-over type and (ii) investment is permanent. Present the multiplier process with the help of tables and algebraic expressions. 6

b) A company is planning to undertake a capital project and it has made the following estimates. The total capital requirement is Rs 25 crore of which Rs 7 crore goes towards working capital, Rs 8 crore towards reorganization of the activities and the remaining amount is spent on the plant and machinery. The life of the project is five years. Its first year's gross revenue is Rs 12 crore. It is expected to increase by 25% annually over the previous year's revenues during second and third years, and then will decrease by 10% annually over the previous year's revenues for the last two years. The company will spend 25% of the revenue on variable factors and Rs 5 crore annually on land, administration and rent. The company is expected to pay a profit tax of 30% annually. It uses a flat depreciation rate. The salvage value is estimated to be Rs 2.5 Cr and there is no recovery of working capital. Derive the net cash flows over the life of the project. Also derive the present value of the net cash flows assuming that the interest rate is 10%. Is the project worth-considering? 5

c) Compare perfect competition with monopoly according to (ii) Entry conditions, (iii) Price and Quantity, (iv) Shut down point, (v) Demand curves of the firms, (vi) Equilibrium situations in long-run. Draw the appropriate diagrams and interpret the comparison algebraically wherever necessary.

A perfectly competitive firm has the following average variable cost function:

$$AVC = 4 - 2Q$$

It is found that the total fixed cost incurred by the firm is \$200. The price per unit of the output produced by the firm is fixed at \$24. What will be the profit maximising output of the firm in the short-run? How much profit/loss will the firm earn/incur? 6

3. a) Have we radically transformed ourselves from a protective regime to a liberal State? Examine in detail the policy reforms in the context of New Economic Policy of 1991 onwards, and compare briefly with the pre-reform period.

Or

Define National Income and state the different methods of its estimation. Also state the problems and fallacies of such estimation. Is it true that National Income can estimate the growth, welfare and sustainability of a country? Also describe the trend in National Income in India. 10

b) Distinguish between <u>any seven</u> of the following: 1 × 7

i) GNP and GDP
ii) GDP and NDP
iii) NI (at mp) and NI (at fc)
iv) NI (at fc) and PI
v) PI and DPI
vi) PI and per capita Income
vii) BoT and BoP
viii) IPR 1948 and IPR 1956
ix) Real Income and Nominal Income
x) Direct and Indirect taxes
