Indian Institute of Technology Kharagpur

Date: _____FN/AN Time: 3 hrs Full Marks: 50 No. of Students: 423

Spring End-Sem. Exam, 2017 Subject: Economics Subject No: HS20001

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

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1. a) Explain the concept of price elasticity of demand and its relationship with average revenue and marginal revenue. **(1 + 2 = 3)**

b) How do you distinguish between production with one variable input and production with two variable inputs? What is an isoquant? What are the properties of isoquants? Using a Cobb-Douglas production function in its general form of $Q = A K^{\alpha} L^{\beta}$ show that $MP_K = \alpha A (K/L)^{\alpha-1}$ and $MP_L = \beta A (K/L)^{1-\beta}$. **(1 + 1 + 2 + 2 = 6)**

b) Explain and illustrate the relationship between SAC and SMC assuming a cubic cost function. **(2)**

c) Given the total cost function $TC = 2Q^3 - 20Q^2 + 30Q + 16$, where TC is the total cost and Q is the output.

Find i) the marginal cost function

ii) the slope of the marginal cost function, and

iii) the output at which marginal cost is equal to average variable cost.

(1 + 1 + 1 = 3)

d) Deliberate how does managerial inefficiency and labour inefficiency may lead to internal diseconomies. **(3)**

2. a) Define and derive demand multiplier. Prove that there can be as many multipliers as the number of demand functions are.

Suppose the consumption function $C = 20 + \frac{2}{5}Y$ and the original planned investment I = 40. Find out equilibrium income. If planned I increases to 100, find out the new equilibrium income and the operation of multiplier under the following two conditions:

(i) The rise in investment is once-over type.

(ii) The rise in investment is permanent.

Present the above two conditions with the help of two separate tables and algebraic interpretations, and offer implications. **(1+2+2=5)**

b) What are the basic characteristics of perfect competition and their implications? How does a firm under perfect competition attain equilibrium in both short- and long-run? How does a firm reach the shut-down point and in this context, explain how a firm minimizes loss.

(2+1+1=4)

c) When the capital is a constraint, which method of capital budgeting is considered better and why? In a situation when a company has several proposals in hand, how would it choose the best combination when the capital constraint prevails? Give a hypothetical example to substantiate your argument. **(1+2=3)**

d) Patanjali plans to undertake a new project in health monitoring sector. The following estimates of the new project are available. The total initial capital requirement is INR 300 Crore of which INR 40 Crore will go towards working capital, INR 100 Crore towards reorganization of the activities and the remaining amount will be invested on the plant and machinery. The life of the project is four years. It is estimated that the first year's gross sales revenue will be INR 250 Crore, which will increase by 20% annually over the previous year's revenues during the subsequent years. The company will spend 30% of the revenue on variable factors and INR 20 Crore annually on rent and administration. The firm is expected to pay a profit tax of 25% annually. The salvage value is estimated to be INR 25 Crore and there is a recovery of working capital by INR 20 Crore. The company applies a flat depreciation rate. Derive the net cash flows over the life of the project. Also derive the net present value of the project assuming that the nominal interest rate is 12% per annum and inflation rate is 2% per annum. Is the project worth-considering?

(2.5+2.5=5)

3. a) How does the integration of economies increase the standard of living, measured by per-capita income? **(6)**

b) What is Human Development? Explain the concept of capability and functioning using suitable mathematical notations. **(5)**

d) In the context of India, critically discuss the two problems of measurement of poverty. **(5)**

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