Indian Institute of Technology, Kharagpur

Date: _____FN/AN Time 3 hrs Full Marks 50 No of Students: 290 (Approx)

Autumn End-Sem. Exam, 2009-10 Subject: Economics Subject No: HS20001

Instruction: 1. Answer any five questions.

2. Figures in the right hand side margin indicate marks.

1. (a) What do you mean by Production? Define the law of diminishing marginal returns and discuss the relationship between Marginal Product (MP) and Average Product (AP) in the production process with one variable input. 1+1+2

(b) Explain the laws of returns to scale with the help of Cobb-Douglas production function. What are the factors responsible for the returns to scale? 3+1

(c) Prove that the exponents α and β in a Cobb-Douglas Production of $Q = A\ K^{\alpha}\ L^{\beta}$ represents the elasticity of output with respect to respective inputs. 2

2. (a) Reynolds Manufacturing produces ballpoint pens. Fixed costs in each production period are Rs 25,000, and the Total Variable Cost (TVC) is given by the equation $TVC = 0.15Q + 0.1Q^2$, where Q is the output. Determine

i) the output where average total cost will be minimum

ii) the marginal cost function 2.5

(b) Write short notes on: 2.5 × 3

i) Isoquant and economic region of production

ii) Relationship between Short-run Average Cost (SAC) and Short-run Marginal Cost (SMC)

iii) Duel problem and shadow prices

3. a) Discuss the processes involved in evaluating a capital project. 2

b) Describe the market conditions of maximizing profit with appropriate economic implications. In this context discuss how shut down point is reached at in perfect competition. How is it different from other situations that the competitive firm may be faced with in the short-run while maximizing profit? Compare these situations with monopoly. 4

c) Amit Saxena, the manager of a firm, has found the average variable cost function to be

$$AVC = 9 - 0.05Q + 0.0005Q^2$$

It was found that the total fixed cost incurred by the firm is $500. The firm operates in a perfectly competitive set up and the price per unit of output produced by the firm is decided at $10.

i) Find the marginal cost function.

ii) What will be the output of the firm in the short-run? How much profit/loss will the firm earn/incur? 4

4. a) Write notes on the following:

i) Methods of capital budgeting with advantages and limitations 2.5

ii) Implications of permanent investment in multiplier with suitable tabular and mathematical interpretation 2.5

b) Jindal Steel is considering to purchase a machine. Three machines namely X, Y and Z are available, each costing Rs 500,000. In comparing the profitability of the machines, a discounted rate of 10% is to be used. Earnings after taxation are expected to be as under. There is no salvage value.

Year	Machine X	Machine Y	Machine Z
First	2,00,000	75,000	1,00,000
Second	2,50,000	1,50,000	2,00,000
Third	1,50,000	3,00,000	2,00,000
Fourth	1,00,000	2,00,000	1,00,000
Fifth	75,000	1,00,000	75,000

Select the most profitable project using (i) pay back period method and (ii) net present value method. 5

5. (a) Discuss the objectives and achievements of India's five year plans, and identify and analyse the areas where the five year plans have failed to achieve their objectives. 5

(b) Discuss the salient features of economic reforms under Rajiv Gandhi and P. V. Narasimha Rao governments and provide an appraisal/impacts of these economic reforms on various sectors of the Indian economy. 5

6. Write notes on:

i) Environmental Kuznets Curve, the economics of sustainable development (definition, sustainability rules and measurements) 5

ii) GATT, WTO and the Indian Economy 5
