Indian Institute of Technology Kharagpur

Date: _____FN/AN Time 3 hrs Full Marks 50 No of Students: 392 (Approx)

Autumn End-Sem. Exam, 2011 Subject: Economics Subject No: HS 20001

Instruction: Answer any five questions

1. a) What do you mean by production? Define the law of Diminishing Marginal Returns. What are the basic features of the three stages of production with one variable input? Elaborate in which stage do you produce and why? **1 + 2 + 2**

   b) Explain the laws of returns to scale with the help of Cobb-Douglas production function. Prove that the exponents α and β in a Cobb-Douglas Production represents the elasticity of output with respect to respective inputs. **3 + 2**

2. a) Discuss the relationship between Short-run Average Cost (SAC) and Short-run Marginal Cost (SMC) curves. If the cost function of a cement factory is $\mathbf{TC = 200 + 5Q - 0.04Q^2 + 0.001Q^3}$, where TC is Total Cost and Q is output, measure the critical value of output with respect to Average Variable Cost (AVC). **1 + 1.5**

   b) Write short notes (any three) on: **2.5 × 3**

   i. Isoquant and economic region of production
   ii. Variable input and fixed input
   iii. Private cost and Social cost
   iv. Economic analysis through Linear Programming

3. a) Describe the processes involved in capital budgeting. If two projects are mutually exclusive, which method should be preferred between NPV and IRR and why? **4**

   b) Jindal Steel plans to undertake a new project in West Bengal. The company has estimated that the capital required for the installation of the plant is Rs 300 Cr. In addition, the company will have to undertake an additional capital investment of Rs 200 Cr towards reorganization of activities including land acquisition, working capital etc. The project is expected to last for 4 years. The incremental sales revenue is estimated to be Rs 400 Cr in the first year which will rise by 20% in next two years and then by 10% in the final year. The company will incur variable cost which is 30% of the sales revenues and its fixed cost is estimated to be Rs 25 Cr annually. The government levies a tax rate of 20% on the company's profit. The company applies flat depreciation rate to consider wear and tear. Assume that the salvage value is Rs 10 Cr

and the company would recover Rs 20 Cr as working capital. Derive net cash flows over the life of the project. If the rate of interest is 8%, derive NPV of the project and suggest whether the project should be undertaken. 6

4. a) Distinguish between perfect competition and monopoly according to their basic characteristics and profit maximizing situations. What are the factors responsible for the existence of monopoly? 5

b) The White Company is a member of the lamp industry, which is perfectly competitive. The price of a lamp is Rs 50. The firm's total cost function is

$$C = 1000 + 20Q + 5Q^2$$

Where C is total cost in rupees and Q is hourly output.

i. What output maximizes profit?

ii. What is the firm's economic profit at this output?

iii. What is the firm's average cost at this output?

iv. If other firms in the lamp industry have the same cost functions as this firm, is the industry in equilibrium? Why or why not. 5

5. a) Is it true that National Income can measure growth, welfare and sustainability of a country? Give suitable examples to prove your answer. 5

b) Describe the trend in the growth of National Income in India, and discuss the difficulties and limitations in its estimation. 5

6. Write notes on <u>any two:</u> 5 × 2

i. Methods of estimation of National Income

ii. Distinguish between the following in the context of National Income accounts:

1. Gross and Net
2. Domestic and National
3. Money and Real
4. Personal and Per capita
5. Transfer earnings and Transfer payment

iii. Trade, Technology and Foreign Investment policy in India.
