

Indian Institute of Technology, Kharagpur

Date \_\_\_\_\_ FN/AN Time: 3 hours Full Marks: 50

No of Students: 33

End Spring Semester 2011-12 Dept: HSS

Sub No: HS20006

5-Year Integrated M.Sc in Economics

Sub Name: Microeconomics II

Instructions: 1. Answer any five questions.

2. Figures in the right hand margin indicate marks.

1. a) Under differentiated oligopoly, "the demand function may be constructed to describe a situation in which price is the independent variable for some sellers and quantity for others. The dependent variable for each seller is then expressed as a function of the independent variables for all the sellers". Explain with notable algebraic formulations/illustrations. 5

b) Consider a duopoly with product differentiation in which the demand and cost functions are

$$q_1 = 88 - 4p_1 + 2p_2, C_1 = 10q_1$$

$$q_2 = 56 + 2p_1 - 4p_2, C_2 = 8q_2$$

How would you distinguish between these demand functions and the corresponding inverse demand functions. Derive a price reaction function for each firm on the assumption that each maximizes its profit with respect to its own price. Determine the equilibrium values of price, quantity and profit for each firm. 5

2. What do you understand by input reaction function?

Let two duopsonists have production functions  $q_1 = 13x_1 - 0.2x_1^2$  and  $q_2 = 12x_2 - 0.1x_2^2$ , where  $x_1$  and  $x_2$  are the labour inputs employed by the duopsonists. Assume that the labour supply function is  $r = 2 + 0.1(x_1 + x_2)$ , where  $r$  is the wage rate. The outputs  $q_1$  and  $q_2$  are sold in competitive markets. Find the input reaction functions and hence determine the Cournot's equilibrium inputs, outputs and profits. How would you accommodate conjectural input variation and Skackelberg type of solution in this context with duopsonist I as the leader and II as the follower. 10

3. a) How would you distinguish between the outward inward kinks in the average revenue curve of an oligopolist and what would be their impact on the corresponding marginal revenue curve? Bring out clearly the underlying behavioural assumptions and analyze the implications in terms of the flexibility of prices in this type of market. 5

b) Suppose the demand function for price increases and for price cuts facing an oligopolist are, respectively

$$q_1 = 280 - 40p_1 \text{ and } q_2 = 100 - 10p_2$$

where  $q$  and  $p$  stand for output and price respectively.

Further, the firm's total cost function is

$$TC = q + 0.025q^2$$

Locate the kink and find out the upper and lower limits of the MR gap. Does MC curve pass through this gap? How would you interpret your results? 5

4. a) Distinguish between saving and investment equilibrium with borrowing and lending and with borrowing and lending. Determine the market rate of interest for both and compare. 6

b) A firm pays the interest rate of 15% on its bonds. The marginal income tax rate that firm faces is 30%. The rate on government bonds is 8%. The return on the average stock of all firms is 12.5%. The estimated beta coefficient for the common stock of the firm is 2 and the firm desires to raise 40% of its capital by borrowing. Determine:

(i) the cost of debt.

(ii) the cost of equity capital.

(iii) the composite cost of capital for the firm. 4

5. a) 'Rent is an excess payment over land's transfer earnings'. Substantiate this statement. In this context, argue how differences in elasticity of supply with respect to economy, firm and industry would lead to differences in rent. 5

b) Prove how elasticity of input substitution between labour and capital decides the relative factor shares. 5

6. Write notes on the following:

3.5 + 3.5 + 3

a) Scarcity rent

b) Technical change and relative factor shares

c) Rent is price determined not price determining

---