[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 7546 **L**

Unique Paper Code : 2273100026

Name of the Paper : Industrial Organisation

Name of the Course : **B.A. (Hons) Economics**

Semester : VIII

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **Five** out of **Seven** questions.
3. Each question carries **18** marks.

1. (a) What is meant by monopolistic competition? Explain its main features. **(9)**

(b) Why do firms under monopolistic competition earn zero profit in the long run but still not produce at the minimum point of average cost? What does this imply about efficiency? **(9)**

2. Consider a town consisting of a single Main Street of length 1. Locations on the street are denoted by $x \in [0, 1]$. Consumers are uniformly distributed along the interval $[0, 1]$. There are two firms, located at $x = 0$ and $x = 1$, producing an identical good. Each firm has constant marginal cost c. Consumers incur transportation cost t per unit of distance. The firms choose prices p_1 and p_2 simultaneously and independently. Assume that all consumers buy exactly one unit of the good, and that both firms produce positive quantities in equilibrium.

(a) Given prices p_1 and p_2, show that the consumer who is indifferent between buying from firm 1 and firm 2 is located at **(6)**

$$\tilde{x}(p_1, p_2) = 1/2 + (p_2 - p_1)/(2t).$$

(b) Using the location of the indifferent consumer, derive the demand functions $q_1(p_1, p_2)$ and $q_2(p_1, p_2)$ for the two firms. **(6)**

(c) Write down the profit function of each firm when marginal cost is c. Derive the firms' reaction functions and solve for the Nash equilibrium prices, quantities, and profits. **(6)**

3. Consider an industry with inverse demand

$$p = a - Q,$$

where three identical firms compete à la Cournot. Each firm has cost function

$$C = F + cq,$$

P.T.O.

where F is the fixed cost faced by the firm and $c > 0$.

(a) Derive the Cournot equilibrium output of each firm and determine their market shares before any merger. (6)

(b) Suppose two of the firms merge. The merged firm has cost function $C = F' + c'q$, where $F < F' < 2F$. Derive the Cournot equilibrium outputs after the merger and compute the market shares of the merged firm and the remaining firm. (6)

(c) Compare the market shares obtained in parts (a) and (b). Under what condition on c' does the merged firm gain a larger market share than each firm had before the merger? Provide an economic interpretation of your result. (6)

4. Consider a duopoly market with two identical firms producing a homogeneous product. The market demand is given by

$$P = a - bQ; \quad b > 0$$

where

$$Q = q + q,$$

and each firm has constant marginal cost c, with

$$a > c > 0.$$

Answer the following:

(a) Find the Bertrand Nash equilibrium and explain why the outcome is the same as the equilibrium that happens in a perfectly competitive market. (6)

(b) Find the Cournot equilibrium, price and profit. (6)

(c) Compare Bertrand and Cournot outcomes in terms of price, output, and profits of the firms. (6)

5. Consider an upstream manufacturer *M* and a downstream retailer *R*. The market demand is

$$Q = 60 - P$$

where P is the retail price. Assume the manufacturer's marginal cost is zero.

(a) Suppose the manufacturer and retailer are separate firms. The manufacturer charges a wholesale price of $w = 20$, and the retailer then chooses the final price P. Find the retailer's profit function, the profit-maximizing retail price, the quantity sold, and the profits of the manufacturer and the retailer. (9)

(b) Now suppose the manufacturer and retailer become one vertically integrated firm. Find the profit-maximizing retail price, the quantity sold, and the total profit. Compare your answer with part (a). What does this show about double marginalization? (9)

6. What is meant by the diffusion of innovation? Why do many innovations spread gradually rather than all at once? (18)

7. Why might entrants be more successful than incumbents in introducing radical innovations? (18)