

Maximum Marks: 100  
Duration: 3 Hours

Date: 21-09-2015  
Close Book Exam

**Instructions:**

- **There are 4 pages and 10 questions in this question paper.**
- **Please attach the question paper along with the original answer sheet**
- **Answer all the questions and strictly adhere to the instructions given.**
- **The question paper is complete in all aspects. You may make reliable assumption if it is necessary.**
- **Marks assigned to each question are given in the bracket.**

**Q. 1 Examine the validity of the following statements: (Answer any 14) (28 marks)**  
**(Word limit Maximum 50 words for each answer)**

- a. The marginal utility of last unit of X consumed is thrice the marginal utility of the last unit of Y consumed. The consumer is in equilibrium only if the price of X is one-third of the price of Y.  
⇒ Not true/False. At equilibrium,  $MU_a/P_a = MU_b/P_b \rightarrow$  Price of X should be three times at equilibrium.
- b. In a consumer's basket it is possible to have all inferior or all normal goods.  
⇒ Not true/False. One can not have ALL inferior goods. Because, if income increases, all inferior good would imply less spending rather than more spending.  
⇒ However, it is possible to have all normal goods with weighted average income elasticity of 1.
- c. As we move from left to right along the income consumption curve (ICC), the consumer's money income, his real income and his utility level decrease.  
⇒ False/Not True.
- d. Price elasticity of demand is measured through the movement along the demand curve.  
⇒ True.
- e. An increase in the income of the consumer would make the demand curve more elastic at a given point.  
⇒ Not True. As income increases, demand would increase at the same price and Demand curve shifts to the right.  $E = (dq/dp) * (P/Q)$ .  $dq/dp$  and P remaining same, Q increases and elasticity decreases.
- f. When demand is price elastic, the total revenue (TR) is directly related to the quantity and inversely related to price of the good.  
⇒ True.  $TR=P*Q$  P and Q are inversely related. As P increases, Q will decrease and hence TR. Because, due to elasticity being more than 1 (absolute), increase in price result in more decrease in Q.
- g. Time series models require data only on the independent variables.

⇒ False. → Requires data on both dependent and independent variables.

**h.** When  $MP < AP$ , the average product would have a tendency to increase as the employment of the factor increases.

⇒ Not true. → Since  $MP < AP$ , additional factor, would increase output by MP but which is less than AP and hence will drag AP lower.

**i.** The short run supply curve of the perfectly competitive firm is given by the rising portion of its marginal cost curve over and above the average cost curve.

⇒ False/Not true, → Short run supply curve is MC above AVC.

**j.** If the demand curves for a monopolist's commodity are identical in two separate markets then by practicing third degree price discrimination, the monopolist will increase total revenue and hence total profits.

⇒ In identical markets, price discrimination is not possible because they have same elasticity at a given price.

**k.** Under first degree price discrimination, total output produced by a monopolist will be equivalent to that of perfectly competitive industry.

⇒ True.

**l.** In the presence of economies of scale in production, a firm can do marginal cost pricing.

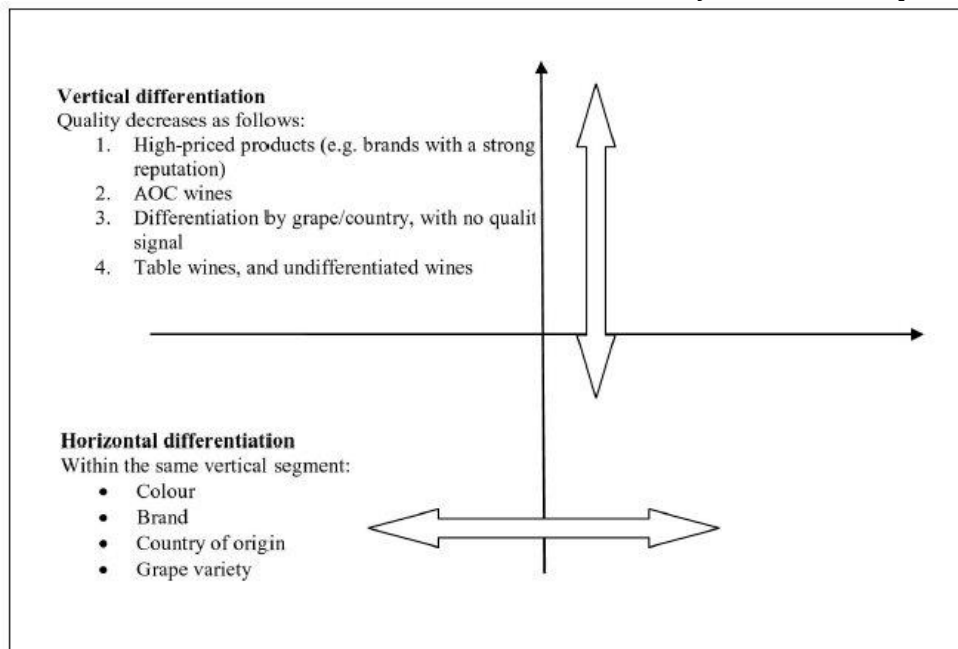
⇒ False. → Under economies of scale, MC keeps falling/decreasing. Hence,  $P=MC$  is NOT profit maximizing.

**m.** In oligopoly models if there is sequence to moves, firms with identical costs of production will have equal market shares in equilibrium.

⇒ False. → This is possible under Simultaneous moves. In sequential moves, there could be first mover advantage (Stackleberg L-F model)

**n.** In monopolistic competition, when firms compete with horizontally differentiated goods they have to separate consumers with different income levels in specifying product differentiation.

⇒ False. → Differentiation based on Income is for vertically differentiated products.



⇒





Q. 3

(2+2+2+2=8 marks)

The director of a theatre company in a small college town is considering changing the way he prices tickets. He has hired an economic consulting firm to estimate the demand for tickets. The firm has classified people who go the theatre into two groups, and has come up with two demand functions. The demand curves for the general public ( $Q_{gp}$ ) and students ( $Q_s$ ) are given below.

$$Q_{gp} = 500 - 5 P$$

$$Q_s = 200 - 4 P$$

- Graph the two demand curves on one graph, with P on the vertical axis and Q on the horizontal axis. If the current price of tickets is Rs. 35, identify the quantity demanded by each group.
- Find the price elasticity of demand for each group at the current price and quantity.
- Is the director maximizing the revenue he collects from ticket sales by charging \$35 for each ticket? Explain.
- What price should he charge each group if he wants to maximize revenue collected from ticket sales?

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Graph the two demand curves on one graph, with P on the vertical axis and Q on the horizontal axis. If the current price of tickets is \$35, identify the quantity demanded by each group.

- Both demand curves are downward sloping and linear. For the general public, the vertical intercept is 100 and the horizontal intercept is 500. For the students, the vertical intercept is 50 and the horizontal intercept is 200. The general public demands  $Q_{gp} = 500 - 5(35) = 325$  tickets and the students demand  $Q_s = 200 - 4(35) = 60$  tickets.

Find the price elasticity of demand for each group at the current price and quantity.

- The elasticity for the general public is  $\epsilon_{gp} = \frac{-5(35)}{325} = -0.54$  and the elasticity for the students is  $\epsilon_s = \frac{-4(35)}{60} = -2.33$ . If the price of tickets increases by one percent then the general public will demand .54% fewer tickets and the students will demand 2.33% fewer tickets.

Is the director maximizing the revenue he collects from ticket sales by charging \$35 for each ticket? Explain.

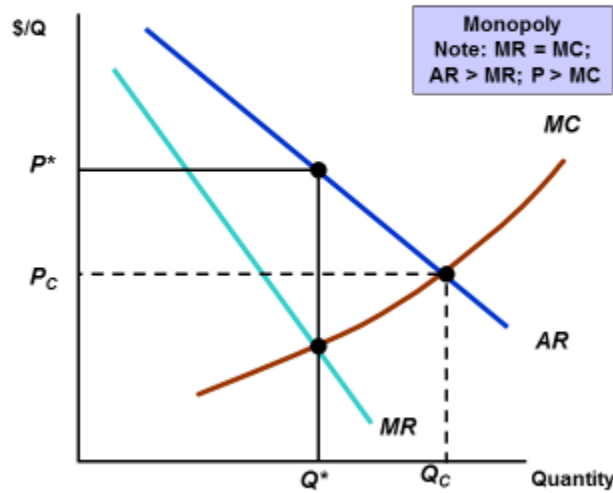




**Q. 5** What is Monopsony? Compare the Equilibrium Price and Quantity determination of a Monopolist and a Monopsonist. (Use diagram to support your answer) **(10 marks)**

- Definition/Meaning of Monopsony 1 mark
- Diagram figure 9.15 pg-320 text book pindyck 6 marks
- Explanation of the diagram. 3 marks

## Monopoly and Monopsony

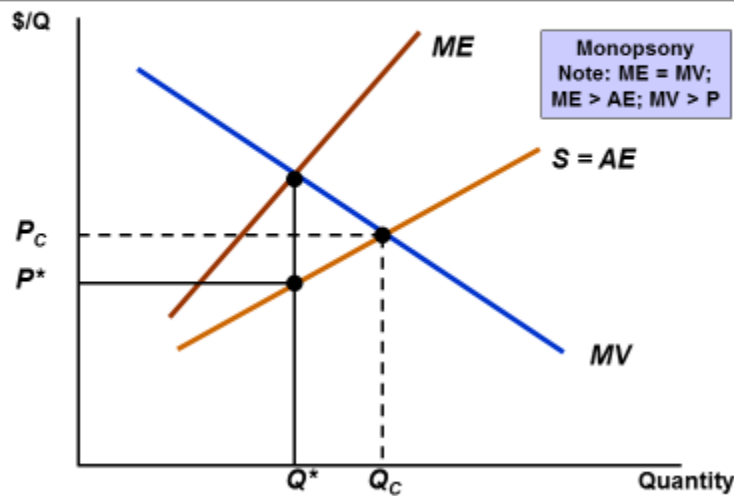


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Chapter 10

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## Monopoly and Monopsony



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Chapter 10

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- ♦ *markets are segmented* so that goods are not easily bought in one market and resold in another.
- Dumping may be a profit maximizing strategy because of differences in foreign and domestic markets.
- One difference is that domestic firms usually have a larger share of the domestic market than they do of foreign markets.
  - ♦ Because of less market dominance and more competition in foreign markets, foreign sales are usually more responsive to price changes than domestic sales.
  - ♦ Domestic firms may be able to charge a high price in the domestic market but must charge a low price on exports if foreign consumers are more responsive to price changes
- Draw a diagram of how dumping occurs when a firm is a monopolist in the domestic market but a small competitive firm in foreign markets.
  - ♦ Because the firm is a monopolist in the domestic market, the domestic market demand curve is downward sloping, and the marginal revenue curve lies below that demand curve.
  - ♦ Because the firm is a small competitive firm in foreign markets, the foreign market demand curve is horizontal, representing the fact that exports are very responsive to small price changes.



Q.7

(6+7=13 marks)

- a. A firm is operating in Monopolistic Competition with the following Demand and Cost functions

$$P=11,100 - 30Q, \quad TC = 4,00,000 + 300Q - 30Q^2 + Q^3$$

What is the short run Equilibrium Output and the price of the firm?

**Solution**

$$P=11,100 - 30Q$$

$$TR=PXQ$$

$$TR= (11,100 - 30Q) \times Q$$

$$TR= 11,100Q - 30Q^2$$

$$MR= 11,100 - 60Q$$

$$TC = 4,00,000 + 300Q - 30Q^2 + Q^3$$

$$MC = 300 - 60Q + 3Q^2$$

$$MC=MR$$

$$300 - 60Q + 3Q^2 = 11,100 - 60Q$$

$$3Q^2 = (11,100 - 300)$$

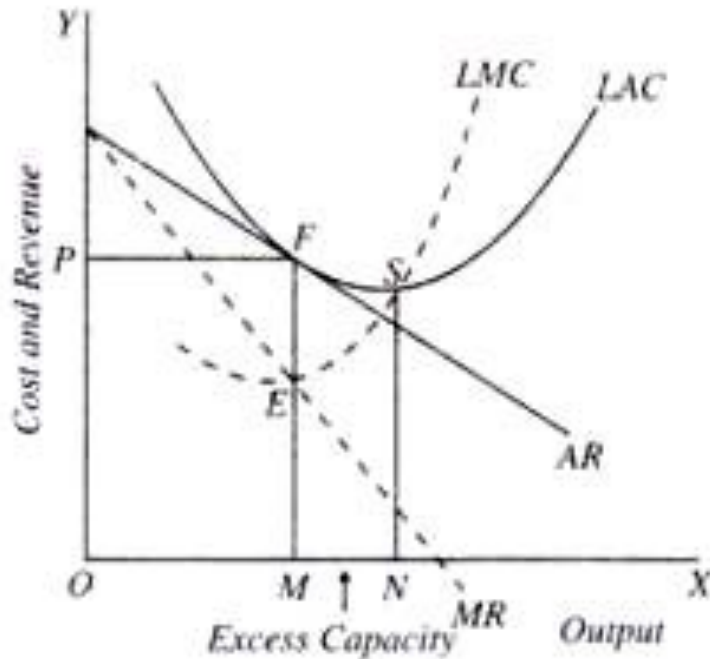
$$Q=60$$

$$P= 11,100 - (30 \times 60) = 9,300$$

Ans: Equilibrium Output 60 units and the price Rs. 9,300 of the firm

- b. What do you mean by the Excess Capacity under Monopolistic Competition? Show how the Excess Capacity can be utilized in the long run by the firm operating under Monopolistic Competition.

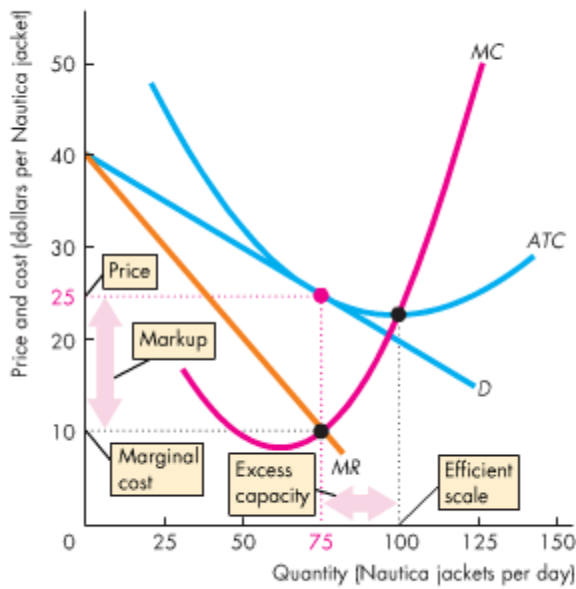
- Meaning of Excess capacity. 1 mark
- Diagram of Excess capacity in the long run.(Long run Normal profit ) 5 marks
- Explanation of the diagram 1 mark



**Fig. 28.11.** *Excess Capacity under Monopolistic Competition*

- ⇒ In the long run, optimal production is where Long Run Average Cost is minimum. (Quantity N in above diagram)
- ⇒ However, in the long run, socially optimum output = M (in above diagram), where  $P=AC$  where AC curve intersects with demand curve. (Tangent). This is where the resources of the society are OPTIMALLY utilized.
- ⇒ Hence, excess capacity. Capacity which (from society point of view) should exist but does not (from producer point of view).
- ⇒ Note: In long run, optimal production is where Min AC and NOT where  $MR=MC$ .
- ⇒

**FIGURE 14.4** Excess Capacity and Markup



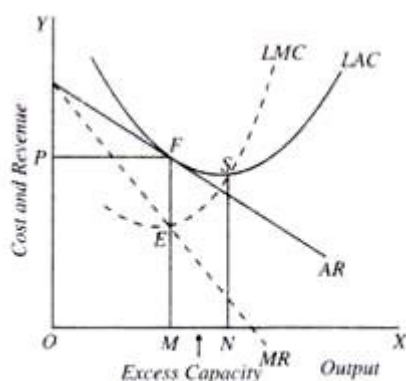
**(a) Monopolistic competition**

### **EXCESS CAPACITY UNDER MONOPOLISTIC COMPETITION**

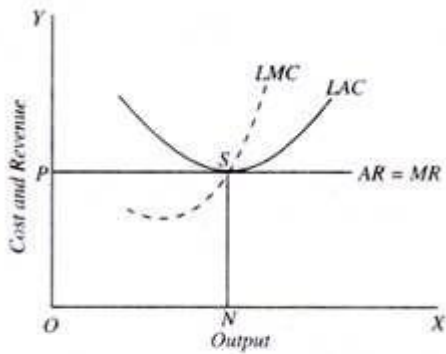
- Theories of Chamberlin's monopolistic competition and Joan Robinson's imperfect competition have revealed that a firm under monopolistic competition or imperfect competition in long-run equilibrium produces an output which is less than socially optimum or ideal output.
- This means that firms operate at the point on the falling portion of long-run average cost curve that is, they do not produce the level of output at which long-run average cost is minimum. Long-run equilibrium of a firm under monopolistic competition is achieved when the demand curve (or average revenue curve) facing a firm becomes tangential to the long-run average cost curve so that it earns only normal profits.
- Under such circumstances a firm can reduce average cost (and hence price) by expanding output to the minimum level of long-run average cost, but it will not do so because its profits are maximised (equality of

marginal revenue with marginal cost is attained) at the level of output smaller than that at which its long-run average cost is minimum.

- Society's productive resources are fully utilised when they are used to produce the level of output which renders long-run average cost minimum. Thus a monopolistically competitive firm produces less than the socially optimum or ideal output, that is, the output corresponding to the lowest point of long-run average cost curve. This is in sharp contrast to the position of the firm in long-run equilibrium under perfect competition, which operates at the minimum point of the long-run average cost curve.
- The amount by which the actual long-run output of the firm under monopolistic competition falls short of the socially ideal output is a measure of excess capacity which means un-utilised capacity. The existence of excess-capacity under imperfect or monopolistic competition can be understood from Figures 28.11 and 28.12. Figure 28.12 depicts the long-run position of a perfectly competitive firm which is in long-run equilibrium at the level of output ON corresponding to which long-run average cost is minimum.



**Fig. 28.11.** Excess Capacity under Monopolistic Competition



**Fig. 28.12.** *Ideal or Socially Optimum Output under Perfect Competition*

- It is at output ON that the double condition of long-run equilibrium, namely  $\text{Price} = \text{MC} = \text{AC}$  is fulfilled. It is thus clear that firms under perfect competition produce socially ideal output. On the other hand, a firm under monopolistic competition depicted in Fig. 28.11 is in long-run equilibrium at output OM at which its marginal revenue is equal to marginal cost and price is equal to average cost (Average revenue curve AR is tangential to average cost curve LAC at point F corresponding to output OM).
- It will be noticed that at output OM long-run average cost is still falling and goes on falling up to output ON. This means that the firm can expand its production up to ON and reduce his long-run average cost to the minimum. Ideal output is the output at which long-run average cost is minimum.
- Therefore, the firm is producing MN less than the ideal output. Thus MN output represents the excess capacity which emerges under monopolistic competition. It is worth nothing that the concept of excess capacity refers only to the long run. This is because in the short run under any type of market structure (including perfect competition) there can be all sorts of departures from the ideal reflecting incomplete adjustment to the existing market conditions.



## **Causes of Excess Capacity:**

- What factors are responsible for the existence of excess capacity under monopolistic competition? It is due to the existence of excess capacity that average cost of production and price of product are higher and output smaller monopolistic competition than under perfect competition.
- There are three main causes of the emergence of excess capacity under monopolistic competition. First, the most important cause of the existence of excess capacity under monopolistic competition is downward-sloping demand curve (or average revenue curve) of the firm.
- A downward-sloping curve can be tangent to a U-shaped average cost curve only at the latter's falling portion. It is only the horizontal demand curve or average revenue curve (as is actually found under perfect competition) which can be tangent to a U-shaped average cost curve at the latter's minimum point. From this, it also follows that the greater the elasticity of average revenue (or demand) curve confronting a monopolistically competitive firm, the less the excess capacity and vice versa. When the demand curve facing a firm is perfectly elastic, there is no excess capacity, as is the case under perfect competition.
- Now, demand curve facing individual firms under monopolistic competition slopes downward due to product differentiation found in it. Various firms produce different varieties and brands of product and each has a certain degree of monopoly power over the variety or brand it produces for fixing price and output.
- If products were homogeneous the demand curve would not have been downward sloping and equilibrium would have been established at the minimum point of LAC without there being any excess capacity.

- The second reason for the emergence of excess capacity under monopolistic competition, as has been emphasised by Chamberlin, is the entry of a very large a number of firms in the industry in the long run. Lured by excess profits in the short run new firms enter the industry in the long run. This results in sharing of market demand among many firms so that each firm produces a smaller output than its full or optimum capacity.
- There are too many grocery shops, too many cloth manufacturing firms, too many automobile parts producing firms, too many barber shops each operating with excess capacity. In fact, under monopolistic competition, given the same demand and cost conditions, number of firms will be larger than even under perfect competition. This is because by expanding output to the minimum point of LAC, fewer firms will be required to meet the given demand for industry's product.
- The conception and the measure of excess capacity as enunciated above is based upon a particular notion of ideal output. Marshall, Kahn, Harrod, Cassel' and Joan Robinson have regarded ideal output or optimum size of the firm as that output at which its long-run average cost is minimum. To, quote Joan Robinson, "In a perfectly competitive industry each firm in full equilibrium will produce that output at which its average costs are minimum.
- Each firm will then be of the optimum size... If competition is imperfect, the demand curve for the output of the individual firm will be falling and the double condition of equilibrium can only be fulfilled for some output at which average cost is falling. The firms will, therefore, be of less than optimum size when profits are normal... It is only if conditions of perfect competition prevail that firms will be of the optimum size and there is no



Suppose two competitors, BALCO, and NALCO, are locked in a bitter pricing struggle in the aluminum industry. In the limit pricing payoff matrix, BALCO can choose a given row of outcomes by offering a limit price ("up") or monopoly price ("down"). NALCO can choose a given column of outcomes by choosing to offer a limit price ("left") or monopoly price ("right"). Neither firm can choose which cell of the payoff matrix to obtain; the payoff for each firm depends upon the pricing strategies of both firms.

		NALCO	
		Limit Price	Monopoly Price
BALCO	Limit Price	Rs (-) 20 m, Rs (-) 30 m	Rs 900 m, Rs 600 m
	Monopoly Price	Rs100 m, Rs 800 m	Rs50 m, Rs 50 m

- Is there a dominant strategy? If so, what is it? IS there Nash equilibrium? If yes, what is it?
- What is the cooperative outcome? Which firm benefits most from the cooperative outcome? How much would that firm need to offer the other to persuade it to collude?

- 
- No Dominant Strategy for either.
  - A Nash equilibrium exists when neither party has an incentive to alter its strategy, taking the other's strategy as given. If Firm 2 chooses Low and Firm 1 chooses High, neither will have an incentive to change ( $100 > -20$  for Firm 1 and  $800 > 50$  for Firm 2). If Firm 2 chooses High and Firm 1 chooses Low, neither will have an incentive to change ( $900 > 50$  for Firm 1 and  $600 > -30$  for Firm 2). Both outcomes are Nash equilibria. Both firms choosing low is not a Nash equilibrium because, for example, if Firm 1 chooses low then firm 2 is better off by switching to high since 600 is greater than -30.
  - The cooperative outcome would maximize *joint* payoffs. This would occur if Firm 1 goes for the low end of the market and Firm 2 goes for the high end of the market. The joint payoff is 1,500 (Firm 1 gets 900 and Firm 2 gets 600).
  - best payoff is  $900 - 100 = 800$ . To persuade Firm 2 to choose Firm 1's best option, Firm 1 must offer at least the difference between Firm 2's payoff under cooperation, 600, and its best payoff, 800, i.e., 200. However, Firm 2 realizes that Firm 1 benefits much more from cooperation and should try to extract as much as it can from Firm 1 (up to 800).





