



INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, BHOPAL

END-SEMESTER EXAMINATION

BATCH: 2018-19, SEMESTER-I

COURSE: ECO101

FULL MARKS: 60

► Answer all the following questions. (Two and half hours.)

**Q 1.** Suppose, you are given with two demand curves:

(i)  $q = 100 - 5p$ .

(ii)  $q = 100 - 10p$ .

Which one is more elastic? For each of them, find  $(p, q)$  combination so that elasticity of demand  $(\eta) = 1$ . For each of them find the marginal revenue (MR) curves. If the market price is 5 unit, calculate consumer surplus for each of these cases. (2+2+2+1+1+1+1)

**Q 2.** Consider a consumer whose utility function is given by  $U(x, y) = xy$ . Suppose  $p_x, p_y$  &  $M$  respectively are Rs 50, 60 and 3000. Let  $p_x$  increases by Rs 50. Calculate Hicksian substitution effect and Slutsky substitution effect. How much extra income to be provided to the consumer to compensate his loss according to Hicks? Find the same according to Slutsky. Calculate the effect of price increase. (3+3+1+1+2)

**Q 3.** Consider the preferences of an individual represented by the following utility functions  $U(x, y) = xy^4$ . Derive the demand functions (for good X and Y) when the consumer's budget line is given by  $p_x x + p_y y = M$  where  $(x, y)$  is a representative commodity bundle and  $p_x, p_y$  &  $M$  respectively denotes price of commodity X, price of commodity Y and money income of the consumer. Derive the Engel's curves for good X and Y and graphically represent them. Find the consumption expenditure ratio of X and Y (2+2+2+2+2)

**Q 4.** (i) Consider the production function  $Q = 5L + 10K$  where  $Q$  is total output,  $L$  is the quantity of labour employed, and  $K$  is the quantity of capital employed. Find two input bundles on the isoquant for  $Q = 100$  and find MRTS (marginal rate of technical substitution) at those bundles. Graphically represent the isoquant. What law does it violate? (1+1+2+2)  
(ii) Why will a profit maximizing firm, using one variable input, produce in stage II. (4)

**Q 5.** Consider the market demand curve given by Q1 (i). Assume there are 20 firms in the industry producing a homogeneous good with a representative short-run cost function  $c(q) = 5 + q^2$ . If each firm individually acts as a price taker, calculate the market equilibrium price. Also calculate the firm level supernormal profit. Find the shutdown price? (5+3+2)

**Q 6.** Consider the market demand curve given by Q1 (i). Suppose the cost function of the monopolist is  $c(q) = 200 + q^2/2$ . What would be the monopolist's profit maximizing price quantity combination (find it carefully)? Suppose now the cost function of the monopolist is  $c(q) = 10q + 10$  and he faces two demand curves in two different markets given by Q1 (i) and (ii). If resale is not possible by law, find out the monopolist's pricing strategy in both the market. Calculate his total profit. (4+3+3)