

Ref. No. Ex/UG/ECO/31/20/2018

**B.A. 2<sup>nd</sup> Year, 3<sup>rd</sup> Semester Examination 2018  
ECONOMICS**

**Time:** ...2. Hours

**MICROECONOMICS II**

**Full Marks 30....**

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Answer any six questions:

6 × 5 = 30

1. a. Does a uniform price monopoly operate in a market with elasticity of demand less than equal to 1? Justify your answer.
- b. After spending 10 years and \$1.5 billion, you have finally gotten Food and Drug Administration approval to sell your new patented wonder drug, which reduces the aches and pains associated with aging joints. You will brand this drug under the brand name Ageless. Market research indicates that the elasticity of demand for Ageless is 1.25 (at all points on the demand curve). You estimate the marginal cost of manufacturing and selling one additional dose of Ageless is \$1.
  - a. What is the profit-maximizing price per dose of Ageless?
  - b. Would you expect the elasticity of demand you face for Ageless to rise or fall when your patent expires?

$$2.5 + (1.5 + 1) = 5$$

2. A monopoly firm serves a market with inverse demand function  $p = a - Q$ . The firm has three plants in its disposal. The plants have their cost functions given by  $C_1 = c_1q_1$ ,  $C_2 = c_2q_2$  and  $C_3 = \frac{1}{2}c_1q_3^2$  respectively with  $c_1 < c_2$ . Find out the monopoly output and the proportion of output produced at each of the plants if: (i)  $a > c_1 + 2$ ; (ii)  $a < c_1 + 2$ .

$$3 + 2 = 5$$

3. Consider an upstream monopoly with its marginal cost of production  $c$  that deals with a competitive downstream market with  $n$  number of identical firms. The price of output produced by the upstream firm is denoted by  $k$ . The production function of a typical downstream firm is such that to produce one unit of output, it needs to use one unit of output produced by the upstream firm and some other inputs. The cost function of each downstream

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firm is given by  $C(y) = ky + \frac{1}{2}y^2$ . The market demand function for the final product is given by  $Y = a - p$ . Assume,  $a > c$ .

- i. Calculate the market price  $p$ .
- ii. What happens to the market price  $p$  as the downstream market becomes more competitive (i.e.  $n$  rises)?

$$4 + 1 = 5$$

4. A firm XY sells two products X and Y at the market. There are 100 consumers at the market. XY believes that the market is characterized by the following demand pattern:

Number of consumers	Maximum willingness to pay for X	Maximum willingness to pay for Y
$t$	200	250
$50 - t/2$	200	120
$50 - t/2$	100	250

The firm can either price the product separately or sell them as a tied product. Assuming the unit cost of production both X and Y is zero, calculate the values of  $t$  at which it would be profitable to sell the tied product at the market.

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5. a. What are the characteristic features of a monopolistically competitive market?
- b. Consider a monopolistically competitive market with representative consumer having utility function  $u = u(q_0, (\sum_{i=1}^n q_i^{1/2})^2)$  where  $q_i$  is the consumption of the  $i$ th differentiated product. Each firm has cost function:  $c(q_i) = q_i + 2$ . Find out the price charged and the quantity produced by each of the firms.

$$2 + 3 = 5$$

6. a. Derive the Nash equilibrium of a price competition game between two firms selling identical products.
- b. Why the outcome is called a 'paradox'?
- c. Outline the assumptions of the model seems to be responsible for appearance of the 'paradox'.

$$3 + 0.5 + 1.5 = 5$$

7. Consider a market with demand function  $D(p) = 13 - p$  where two firms supply identical products and play a quantity setting game with each other. The unit cost of production of each firm is 1. Find out the conditions under which collusion can be sustained between the firms.

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8. Consider a T-shirts market with a market demand given by:  $Q = 100 - p$ .
- (i) Assume you are operating as a monopolist at the market with unit cost of production is 10. What would be your choice of output and price? How much profit would you earn?
  - (ii) Suppose you expect a new firm to enter the market that would follow your output and would produce similar T-shirts at the same unit cost.
    - a. If you decide to block entry of the new firm, how many T-shirts would you produce at what price? What would be your profit?
    - b. If you allow entry, how many T-shirts would you produce at what price? What would be your profit?
    - c. Would the entrant believe that you would block her entry in the market? Explain your answer.

(If necessary approximate a value to its nearest whole number)

$$(1.5 + (1.5 + 1.5 + 0.5)) = 5$$