National University of Lesotho

BA SUPPLEMENTARY EXAMINATIONS

EC4317 – Industrial Organization

August 2023   **100 Marks**   **3 Hours**

INSTRUCTION: Answer **question one** and **any other two** questions.

Question 1

A monopolist serves a market with an aggregate demand function given by $Q = 36 - 3P$. The monopolist's cost function is given by $C(Q) = 2Q$.

a) How much profit can the monopolist generate with first-degree price discrimination if resale can be prevented? **[6]**

b) What is the associated deadweight loss relative to the competitive level of output? **[10]**

c) Suppose that the monopolist can partition its market into two separate submarkets. The demand function for submarket 1 is given by $Q_1 = 20 - 2P_1$ and the demand function for submarket 2 is given by $Q_2 = 16 - P_2$.

    i. What prices would this monopolist set if she practices third degree price discrimination? **[10]**

    ii. What is the level of profits that would be realised if resale can be prevented?

    iii. What level of profits would the monopolist realise if resale cannot be prevented?**[7]**

    iv. Does price discrimination in this case lead to higher economic welfare? Provide the economic basis for your claim. **[10]**

d) Suppose that this monopolist must incur up-front entry costs of $\$S$ before it enters this market. What inference can you draw about the value of S if the monopolist enters the market when allowed to practice third-degree price discrimination but does not enter the market when constrained to uniform monopoly pricing? **[7]**

Question 2

a) Provide an example of a firm that has market power in Lesotho, clearly explaining the sources of its market power. **[10]**

b) Discuss whether the profits of the firm mentioned in *(a)* can persist in the long-run or not. **[8]**

c) Does the market power of the firm in *(a)* warrant public policy intervention in the form of regulation and antitrust laws? Discuss. **[7]**

Question 3

Maseru has a more-or-less free market in taxi services. Any firm can provide taxi services as long as the drivers and cabs satisfy certain safety standards. Let us suppose that the constant marginal

cost per trip of a taxi ride is M5 and that the average taxi has a capacity of 20 trips per day. Let the demand function for taxi rides be given by $D(P) = 1100 - 20P$, where demand is measured in rides per day. Assume that the industry is perfectly competitive.

a) i.   Determine the competitive equilibrium price per ride?   [2]

   ii.   What is the equilibrium number of rides per day?   [2]

   iii.   What is the minimum number of taxi cabs in equilibrium?   [2]

b) During the Roof of Africa Rally, the influx of tourists raises the demand for taxi rides to $(P) = 1500 - 20P$. Find the following, Based on the assumption that during the Rally, the number of taxi cabs is fixed and equal to the minimum number found in part *(a)* find the following: equilibrium price; equilibrium number of rides per day; profit per cab per day.   [8]

c) Now suppose that the change in demand for taxi cabs in part *(b)* is permanent.

   i. Find the equilibrium price, equilibrium number of rides per day, and profit per cab per day.   [5]

   ii. How many taxi cabs will be operated in equilibrium? Compare and contrast this equilibrium with that of part *(b)*. Explain any differences.   [6]

Question 4

The demand for milk and the total costs of Tsebo's dairy farm, the only dairy farm in Roma, are specified by the following equations:

$$P(Q) = 100 - Q$$
$$TC(Q) = 30Q$$

a) Derive an equation for marginal revenue of the monopolist. Graph the demand and marginal revenue curves.   [5]

b) Derive the marginal cost (MC) and average cost (AC) of milk production. Graph MC and AC on the same graph as *a)*.   [3]

c) Show the monopoly's profit-maximizing price (P) and quantity (Q) on the same graph as *a)*. How much are its profits?   [8]

d) What is the efficient level of milk production?   [5]

e) Show on the graph the total surplus associated with efficient production. Show the consumer surplus that would result under monopoly.   [4]

Question 5

An entrepreneur employs L units of labour and K units of capital to produce a good, say football replica shirts. The firm has a Cobb Douglas production function $Q = AL^\alpha K^{1-\alpha}$ where $A = 100$ and $\alpha = 1/2$. In the short run, the amount of capital is fixed at $K = 10$ units. Assume that the wage rate $w = 2$, the cost of capital $r = 1$ and the output price $p = 1$.

   (a) How much labour should the firm hire? **[11]**

   (b) How much should it hire if

      (i)   the wage rate falls to $w = 7/4$? **[7]**

      (ii)   the price rises to $p = 5/4$? **[7]**