



**ZCAS University**

**SEC5302 MANAGERIAL ECONOMICS**

**MID SEMESTER EXAMINATION**

**25 OCTOBER 2023**

**16:30 – 19:30 HOURS**

**TIME ALLOWED: THREE HOURS (plus 5 minutes to read through the paper)**

**INSTRUCTIONS:**

1. Section A: this question is **compulsory** and must be attempted.
2. Sections B: Answer **TWO (2)** questions from this section.
3. This question paper carries a total of **100 marks**.
4. Candidates must **not turn this page** until the invigilator tells them to do so.

**SECTION A: All questions in this section are compulsory and must be answered.**

**Question One**

- a) Suppose that the total market demand for a product consists of the demands of individual 1 and individual 2. The demand equations of the two individuals are given by the following equations:

$$Q_{D,1} = 20 - 2P$$

$$Q_{D,2} = 40 - 5P$$

- i) What is the market demand equation for this product? Graphically illustrate your response.  
ii) As a manager what do information do you derive from the market demand curve?

**(10 Marks)**

- b) Discuss and graphically illustrate the impact on quantity demanded, using equilibrium as determined by both demand and supply and holding all other factors constant, of changes of the following factors:

- i) An increase in consumer income.  
ii) An increase in the price of a substitute good.  
iii) An increase in the price of the good.  
iv) A decline in the population.  
v) Expectations of an increase in the price of the good.

**(20 marks)**

- c) The market demand and supply equations for a product are:

$$Q_D = 300 - 3P$$

$$Q_S = 100 + 5P$$

where Q is quantity and P is price.

- i) What is the equilibrium price and quantity for this product?  
ii) Suppose that an increase in consumer income resulted in the new demand equation:

$$Q_D = 420 - 3P$$

What is the new equilibrium price and quantity for this product?

- iii) Suppose the government enacts legislation that imposes a price ceiling equivalent to the original equilibrium price. Using the demand equation in part (ii), what is the result of this legislation?  
iv) *When changes in both demand and supply occur simultaneously, it is more difficult to predict the effect on price and quantity demanded.* Discuss the statement and illustrate

using graphs for the following two scenarios: a) an increase in demand and an increase in supply; and b) an increase in demand and a decrease in supply.

(20 marks)

(Total 50 marks)

**SECTION B: Attempt any TWO questions in this section.**

**Question Two**

The demand equation for a popular brand of fruit drink, Fruity, is given by the equation:

$$Q_x = 10 - 5P_x + 0.001I + 10P_y$$

Where  $Q_x$  = monthly consumption of Fruity per family in litres  
 $P_x$  = price per litre of the fruit drink = \$2.00  
 $I$  = median annual family income = \$20,000  
 $P_y$  = price per litre of a competing brand of fruit drink = \$2.50

- What is the effect of changes in the parameter estimates ( $P_x$ ,  $I$  and  $P_y$ ) on monthly consumption of Fruity per family.
- At the stated values of the explanatory variables, calculate the monthly consumption (in gallons) of Fruity.
- Suppose that median annual family income increased to \$30,000. How does this change your answer to part b? Based on your response and referring to the Law of Demand, discuss whether Fruity is a normal or inferior good.
- As a manager, you are interested in estimating the demand for Fruity. Aside from the variables included in the given demand equation, briefly discuss two other factors that may also be relevant in estimating the demand for Fruity.
- Explain the significance for economic theory of the relationship between price and perceived quality of Fruity.

(25 marks)

**Question Three**

Karibu Ltd. produces a popular brand of snacks called Creamy Blue Biscuits. Consider the demand and supply equations for Creamy Blue Biscuits:

$$Q_{D,x} = 150 - 2P_x + 0.001I + 1.5P_y$$

$$Q_{S,x} = 60 + 4P_x - 2.5W$$

where  $Q_x$  = monthly per-family consumption of Creamy Blue Biscuits  
 $P_x$  = price per unit of Creamy Blue Biscuits  
 $I$  = median annual per-family income = \$25,000



$P_y$  = price per unit of an Apple Pie Cookie = \$5.00

$W$  = hourly per-worker wage rate = \$8.60

- a) What type of good is an Apple Pie Cookie?
- b) What is the equilibrium price and quantity of Creamy Blue Biscuits?
- c) Suppose that median per-family income increases by \$6,000. What is the new equilibrium price and quantity of Creamy Blue Biscuits?
- d) Suppose that in addition to the increase in median per-family income, collective bargaining by Karibu Limited resulted in a \$2.40 hourly increase in the wage rate. What is the new equilibrium price and quantity?
- e) In a single diagram, illustrate your answers to parts b, c, and d.

(25 marks)

#### Question 4

- a) Consider the demand equation  $Q = 25 - 3P$ , where  $Q$  represents quantity demanded and  $P$  the selling price.
  - i) Calculate the arc-price elasticity of demand when  $P_1 = \$4$  and  $P_2 = \$3$ .
  - ii) Calculate the point-price elasticity of demand at these prices. Is the demand for this good elastic or inelastic at these prices?
  - iii) What, if anything, can you say about the relationship between the price elasticity of demand and total revenue at these prices?
  - iv) What is the price elasticity of demand at the price that maximizes total revenue?
- b) The firm needs to have information about likely demand to pursue an optimal pricing strategy. This is because it can only charge a price that the market will accept if it is to sell the product. Demand estimation attempts to quantify the link between the level of demand and the variables which determine it. Discuss two of the three basic methods used to estimate the demand function.
- c) The market price of a good or service is one of the factors that will influence a firm's decision to alter the quantity supplied of a particular good or service. However, it is not the only factor. As a firm manager, discuss four other factors that determine the level of supply. In your discussion, highlight the expected direction of the change in supply (increase or decrease) when there is a change in the factors as well as the impact on the supply curve.

(25 marks)

(Total 50 marks)

**END OF MID-TERM EXAMINATION**