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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY

UNIVERSITY EXAMINATION, 2024/2025ACADEMIC YEAR
SECOND YEAR, FIRST SEMESTER EXAMINATION
FOR THE DEGREE OF BACHELOR OF SCIENCE
(BUSINESS ADMINISTRATION)

Date: 15th April, 2024
Time: 2.30pm –4.30pm

KFI 201 INTERMEDIATE MICRO ECONOMIC THEORY

INSTRUCTIONS TO CANDIDATES

ANSWER **QUESTION ONE (COMPULSORY)** AND **ANY OTHER TWO** QUESTIONS

QUESTION ONE (30 MARKS)

In today's digital age, smartphones have become an integral part of daily life for consumers worldwide. With a myriad of options available in the market, understanding consumer preferences is crucial for smartphone manufacturers to design and market products effectively. The smartphone industry is highly competitive, with numerous brands offering a wide range of features, designs, and price points. Consumer preferences play a pivotal role in determining which smartphones succeed in the market and which ones struggle to gain traction.

Imagine a hypothetical scenario where a team of researchers conducted a study on consumer preferences in the smartphone market. The study involved surveying a diverse group of participants from different demographics, including age, income levels, and technological proficiency. The researchers employed a combination of qualitative and quantitative methods to gather data on consumer preferences. Semi-structured questions were used to quantify preferences based on specific attributes such as price, brand reputation, features, design, and operating system preferences (iOS vs. Android).

a) Using a well labelled diagram, show and explain consumers' equilibrium at the point of utility maximization from the use of smartphones. (6 marks)

b) Consumers were found to give smartphones first preference. Explain AXIOMS of consumer preference ordering which imply that indifference curves never cross and are always downward sloping and convex. (6 marks)

c) Suppose the smartphone manufacturer behave like a monopoly in both domestic and foreign markets. The smartphone demand functions in each market is given as follows; $Q_1 = 49\frac{1}{3} - {}^{2}/_{3}\,P_1$(Domestic market) and Q_2 = 36- 1/2P2 (Foreign market). The manufacturer has a cost function of the form:
$C = Q_1^2 + 2Q_1Q_2 + Q_2^2 + 120$.

i) Find the profit-maximizing price and output level for each market (6 marks)
ii) Calculate the profit for this monopolistic producer (4 marks)

d) Smartphone Manufacturing Company has a production function of Cobb-Douglas form as: $Q = 50K^{\frac{2}{5}}L^{\frac{3}{5}}$. If the prices of labour and capital use in the production of the smartphones are Kshs. 4 and Kshs. 8 respectively and the company has Kshs. 400 to spend on inputs.

i) Set up the constrained output optimizing problem 2 marks)

ii) Solve for the optimal inputs needed to produce output Q

(6 marks)

QUESTION TWO (20 MARKS)

a) Carol spends 150 shillings per month on juice and buns at the University tuck shop. A cup of coffee costs 15 shillings and a bun costs 10 shillings.

i) Using a diagram write the equation for Carol's tuck shop budget constraint

(4 marks)

ii) Assume that Carol never drinks juice without eating one bun, and never eats buns without drinking juice. How much of each will she consume? Draw some of her indifference curves. (6 marks)

iii) A consumer was found to consume two good in equal proportion to achieve maximum utility. What do we call goods that are always consumed in equal proportion?

(2 marks)

b) Consider the production function $Q = 25\ L^{1/2}K$

i) Show whether the production function exhibit increasing, decreasing, or constant returns to scale? (3 marks)

ii) If the price of labor is 80 shillings and the price of capital is 40 shillings, what capital-labor ratio will the firm choose to minimize its production costs? (5 marks)

QUESTION THREE (20 MARKS)

a) A firm has a production function of Cobb-Douglas form given as $(K, L) = K^{2/3}L^{1/3}$. The firm uses both labour (L) and capital (K) in the production process, let w and r be the prices for labour and capital respectively. Derive the conditional factor demand function for the firm

(10 marks)

b) Assume an individual offering printing services in Mwihoko that the person acts as a price taker. The prevailing market price of printing is Kshs. 20 per page. The costs of printing by the business person are given as;

$C = 0.1q^2 + 10q + 50$

Where q is the number of pages printed in a day

Required:

i) How many pages should be printed in order to maximize profit?

(5 marks)

ii) Calculate maximum daily profit made by the business.

(5 marks)

QUESTION FOUR (20 MARKS)

Consider an individual consumer with the following utility function $U(X,Y) = (XY)^{0.5}$. Given that the price of X is P_X and that of Y is P_Y while income is M

a) Calculate the consumer's demand functions for X and Y (8 marks)

b) Assume that initially the price of X, P_X= 20, price of Y, P_Y= 10 and the consumer's money income M= 200. Suppose that the price of X falls to P_X= 15

i) Calculate the Slutsky substitution effect (5 marks)

ii) Determine the income effect (5 marks)

iii) Total effect of price change hence type of good in question (2 marks)

QUESTION FIVE(20 MARKS)

a) A monopolist faces the following markets with the following demand functions:

$X_1 = 100 - 2P_1$

$X_2 = 100 - P_2$

Assume that the monopolist marginal cost is constant at KES 10. Find the price that should be charged in each market in order to maximize profits if the monopolist:

i) Can discriminate (8 marks)

ii) Cannot discriminate (4 marks)

b) Show that the following utility functions represent the same preferences

$U_1(x, y) = xy$

$U_2(x, y) = x^3y^3$

(8 marks)