CENTRAL UNIVERSITY

RE-SIT EXAMINATION

FACULTY OF ARTS AND SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS

ECON 301 (3 CREDITS)

INTERMEDIATE MICROECONOMICS

LEVEL 300

AUGUST, 2017

DURATION: 2 HOURS

STUDENT ID No..

INSTRUCTIONS

ANSWER ANY THREE QUESTIONS

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LECTURER: JAMES BAKA

Q1.

a) Given the utility function $u = f(x,y)$ and budget constraint $X\,Px + Y\,Py = M$, where Px and Py are respectively the prices of the commodities X and Y and M is the money income of the consumer, derive mathematically the optimum condition of the consumer. (6 marks)

b) An individual's utility function is given by $U = xy$ where x and y denote the two goods. The prices of the goods are, respectively GH¢2 and GH¢10. Assuming that the consumer has GH400 to spend on these goods

i) Find the utility – maximizing basket (10 marks)

ii) What is the index of utility at the optimum? (2 marks)

iii) Verify that at the optimum the ratio of marginal utility to price is the same for both goods. (2 marks)

Q2.

a) Distinguish between a compensated demand function and an ordinary demand function for an individual consumer. (4 marks)

b) Obtain an ordinary demand function for an individual whose utility function is given as $U = xy$, with prices of x and y respectively as Px, Py and money income as M. Consider x and y as normal goods. (8 marks)

c) Show that the function under (b) is homogenous of degree zero in price and income. Explain this result. (8 marks)

Q3.

a) Distinguish between a production function and a production isoquant (4 marks)

b) For a production function $Q = AL^{\alpha} K^{\beta}$, where L and K are respectively labour and capital inputs; α, β and A are positive constants.

i) Provide the name of this production function and economic meanings of α, β and A. (6 marks)

ii) Obtain the marginal product of each input and the marginal rate of technical substitution of L for K. (8 marks)

iii) Given that $\beta = (1-\alpha)$, obtain the degree of homogeneity of the production function and show output response to a proportionate increase of all inputs. (2 marks)

Q4.

a) A firm faces the general cost function of C = wL + rK and production function of Q = f (L,K). K and L are respectively, capital and labour, w and r represent wage rate of labour and rented price of capital, respectively. Derive by using calculus the conditions to maximize output for a given level of cost (C*). (6 marks)

b) Given $Q = 100 K^{0.5} L^{0.5}$, w = GH¢30 and r = GH¢40, and total outlay of GH¢1000

i) Obtain the quantity of labour and capital units that the firm should use in order to maximize output. (10 marks)

ii) Calculate the maximum output (4 marks)

Q5. Given the following total variables cost (TVC) schedule and total fixed cost (TFC) = GH¢12,

a) Find TC, AFC, AVC, AC and MC for the various levels of output.

Q	1	2	3	4	5	6
TVC	6	8	9	10.5	14	21

(8 marks)

b) What is the relationship between AVC, AC, and MC? (8 marks)

c) Explain the shape of each of the curves under (b) (4 marks)

Q6.

a) Derive with the aid of calculus the first – and second – order conditions for output that a perfectly competitive firm must produce in order to maximize total profits. (6 marks)

b) A perfectly competitive firm faces price = GH¢4 and total cost (TC) $= Q^3 - 7Q^2 + 12Q + 5$.

i) Determine by using calculus the best level of output of the firm by the marginal approach. (11 marks)

ii) Calculate the profit. (3 marks)