Course Code /Title: ECO 301/Intermediate Microeconomics

Instruction: Attempt any <u>four</u> questions

Time Allowed: 2 Hours

1. (a) With the aid of well-labeled graphs and brief explanations, illustrate the substitution and income effects of a fall in price for: (i) inferior good (ii) Giffen good (iii) normal good

(b) Given a consumer's utility function $U = q_1 q_2$ and a budget constraint equation: $Y = p_1 q_1 + p_2 q_2$ where $p_1$ is the price of good $q_1$ and $p_2$ is the price of good $q_2$, derive the consumer's Hicksian demand functions for goods $q_1$ and $q_2$. **(17.5 marks)**

2. (a) The utility function of a consumer is expressed as: $U = 20 q_1 q_2$ where $q_1$ and $q_2$ represent the quantities of commodities consumed, find the utility-maximizing quantities of the two commodities given a budget constraint: $50 q_1 + 20 q_2 \leq N5000$. Is utility actually maximized?

(b) What are the features of a utility function?

(c) Explain the principle of equi-marginal utility **(17.5 marks)**

3. (a) Maximize $Q = AL^\alpha K^\beta$ subject to $C = wL + rK$

(b) Given $q = A b_1^\alpha b_2^{1-\alpha}$ where $b_1$ and $b_2$ are variable inputs, show that elasticity of substitution equals one. **(17.5 marks)**

4. (a) A discriminating monopolist's cost function is expressed as $C = 25 + 20q$ while his demand functions in two sub-markets are $P_1 = 40 - 2.5q_1$ and $P_2 = 90 - 5q_2$ respectively determine:

(i) $q_1$ and $q_2$ (ii) $p_1$ and $p_2$ (iii) $e_1$ and $e_2$ (iv) total output (v) total profit

(b) Confirm if the SOC is satisfied. **(17.5 marks)**

5. In a monopolistic market, the cost function of a firm is expressed as: $C = 50q + 5q^2$ while the market demand function is $P = 350 - 3q$. Determine:

(a) The equilibrium quantity of output produced and the monopolist's profit level

(b) What would have been the equilibrium price, output and profit of the firm if the industry were to be perfectly competitive?

(c) With the aid of graph and concise explanation, highlight the relationship among long run average cost curve, returns to scale and economies of scale. **(17.5 marks)**

6. Explain the following concepts or terms:

(a) Homogeneous production function (b) factor intensity and efficiency of production
(c) Input and output expansion paths (d) Isocost and isoquant
(e) Bilateral monopoly **(17.5 marks)**