Strathmore
UNIVERSITY

Strathmore Institute of Mathematical Sciences
BBS FIN/FE
END OF SEMESTER EXAMINATION
(MICROECONOMICS II: BSE 2206)

DATE: 19 July 2017 Time: 2Hrs

Instructions
This examination consists of FIVE questions. Answer **QUESTION ONE(COMPULSORY)** and any other TWO questions.

1. (a) Eglah spends all her income in two types of goods; bags of crisps x_1 and video games x_2. Eglah's preferences are presented by the utility function;

$$u(x_1, x_2) = (x_1)^4(x_2)^2$$

   (i) Find the marginal rate of substitution for bundle (5,1). Which good (x_1 or x_2) is relatively more valuable to Eglah (**5 Marks**).

   (ii) Determine optimal consumption x_1, x_2: given values of $p_1 = 4$, $p_2 = 6$ and $m = 60$. (**3 Marks**)

   (b) With relevant examples, explain what causes momopolies **(8 Marks)**

   (c) Explain whether the production function $f(K, L) = K^{0.3}L^{0.3}$ exhibits increasing, decreasing or constant returns to scale **(2 marks)**

   (d) State and explain the implications of the first welfare theorem **(4 Marks)**

   (e) Suppose fixed cost $F = 4$ and variable cost is $c(y) = 4y^2$. Find ATC^{MES} and y^{MES}. Find equilibrium price and aggregate output in an industry with 8 firms assuming demand is given as $y = 20 - p$ **(4 Marks)**

   (f) In the context of game theory, briefly explain the following concepts;

   (i) Nash Equilibrium **(2 Marks)**

   (ii) Dominant strategy **(2 Marks)**

2. (a) Consider an economy with two goods: clothing x_1 and food x_2. Kiprop's initial endowment $\omega^K = (80, 20)$ and Nafula initial endowment $\omega^N = (20, 30)$. Utility functions of Kiprop and Nafula are given by:

$$u^i = (x_1, x_2) = \frac{1}{4}ln(x_1) + \frac{1}{4}ln(x_2)$$

   (i) Plot an edgeworth box and mark the point corresponding to the initial endowments (**4 Marks)**

   (ii) Give the definition of Pareto efficient allocation and provide its equivalent characterization in terms of MRS equation. Is the endowment allocation pareto efficient? (**3 Marks)**

   (iii) Find the prices and the allocation in the competitive equilibrium **(7 Marks)**

   (iv) Using MRS condition, demonstrate that the competitive allocation is pareto efficient. **(2 marks)**

   (b) With relevant examples explain the following axioms of consumer choice;

   (i) Transitivity **(2 Marks)**

   (ii) Convexity **(2 Marks)**

3. (a) Consider an industry with the inverse demand equal to $p(y) = 6 - y$ and suppose that the total cost function is $TC = 2y$.

   (i) What are the total gains to trade in this industry? **(3 Marks)**

   (ii) Find the level of production and the price if there is only one firm in the industry charging a uniform price. Find demand elasticity at the optimum**(4 Marks)**

   (iii) Find the profit of the monopoly and deadweight loss (DWL) given that monopoly uses the first degree price discrimination **(3 Marks)**

   (iv) Find the individual and aggregate production and the price in a cournot Nash equilibrium given that there are two firms (**6 Marks)**

   (b) Suppose two goods are perfect complements with the following utility function:

$$U = min\{x, y\}$$

   and $p_x = 2$; $p_y = 4$; and $m = 24$. Solve for the optimal consumption (x, y). **(4 Marks)**

4. (a) Consider a profit maximizing firm. Explain whether the following statements are true or false.

   (i) For price taking ,profit maximizing producers, the "constraint" is determined by the technological environment in which the producer finds himself, while the "tastes" are formed by the economic environment in which the producer operates **(4 Marks)**

   (ii) Every profit maximizing producer is automatically cost-minimizing **(2 Marks)**

   (iii) Every cost-minimizing producer is automatically profit maximizing **(3 Marks)**

   (b) Oscar is an owner of Lamborghini Veneno, one of the most expensive cars ever made. its market value is estimated at 8 million dollars. In case of a car collision the value of the car drops to 4 million dollars. The probability of a collision is $\pi_c = 0.5$. In short, Lamborghini is a lottery (8,4).

(i) Oscar's Bernoulli utility function is given by $u(c) = 10lnc$. Write down his Von Neumann-Morgensten (expected) utility function over lotteries $u(C_c, C_{nc}$. Is oscar risk averse, risk neutral or risk loving? **(3 Marks)**

(ii Find the optimal level of wealth (C_c, C_{nc}) and the coverage x. Is Oscar fully insured? **(6 Marks)**

(c) Murungi is a programmer at Silcon Savannah and his hourly wage is $w = Kes.1000$. He has 24 hours a day but does not have any other form of wealth. He consumes a pizza everyday at a price of $P_{pz} = Kes.500$. Find Murungi's real wage rate and interpret its value economically. **(2 Marks)**

5. (a) Benjamin spends his time either watching movies (x_1) or listening to songs- MP3 downloaded from internet (x_2). His preferences are:

$$u(x_1, x_2) = 4ln(x_1) + ln(x_2)$$

His total income is $m = 100$ the price of MP3, $p_2 = 1$. Suppose that the price of a movie drops from $p_1 = 10$ to $p_1 = 5$;

(i) By how much the consumption of movies changes due to the price drop? **(4 Marks)**

(ii) Are movies ordinary or Giffen goods? explain **2 marks)**.

(iii) By how much x_1 changes because movies are cheaper relative to MP3? **(3 Marks)**

(iv) Find the effect of increased purchasing power of Benjamin's income **(2 Marks)**

(v) Show the total change, the substitution and income effects on the graph **(3 Marks)**.

(b) A producer has the following technology

$$y = \sqrt{K + L}$$

(i) Does this function have decreasing, increasing or constant returns to scale? **(2 Marks)**

(ii) Find analytically (the variable) cost function given prices of inputs $w_K = 1$ and $w_L = 2$ **(4 Marks)**

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