Strathmore Institute of Mathematical Sciences
BBS FE/FIN
SPECIAL EXAMINATION
BSE 2206: MICROECONOMICS II

Instructions

- **This examination consists of FIVE questions.**

- **Answer Question ONE (COMPULSORY) and any other TWO questions.**

1. (a) Economists usually make some assumptions about the "consistency" of consumers' preferences. Some of the assumptions about preferences are so fundamental that they are referred as "axioms" of consumer theory. Using relevant examples explain any two axioms of consumer choice **(9 Marks)**

   (b) Using well labeled diagrams distinguish between the following pair of concepts;

      (i) Normal versus inferior goods **(4 Marks)**

      (ii) Ordinary versus giffen goods **(4 Marks)**

   (c) Define the concept of pareto efficiency. Does a competitive market achieve pareto efficiency? **(5 Marks)**

   (d) In the context of production technology, explain the concept of technical rate of substitution **(3 Marks)**

   (e) Find optimal choice given quasilinear preferences $u(x_1, x_2) = x_1 + 100 ln x_2$, prices $p_1 = 8, p_2 = 1$ and income $m = 80$ **(5 Marks)**

2. (a) Janet's preferences over consumption bundles (x,y) are summarized by the following utility function:

$$u(x, y) = 16x - 2x^2 + 4y$$

   where x is the amount of good x that Janet consumes and y is the amount of y that Janet consumes. Let P_x and P_y be the prices of goods x and y respectively. Let M be Janet's income. Janet's goal is to maximize her utility subject to her budget constraint.

(i) Find an algebraic expression for Janet's marginal rate of substitution between goods x and y. In addition, give a concise explanation of the meaning of the marginal rate of substitution **(6 Marks)**

(ii) Suppose that $P_x = P_y = 2$ and $M = 24$. Determine Janet's optimal consumption bundle **(3 Marks)**

(iii) Suppose now that P_x increases to 6, while P_y and M remain the same. What are Janet's optimal choices for x and y in this case? Is Janet better off than she was in part (ii)? Explain **(4 Marks)**

(iv) How much extra income must Janet be given in order to compensate her for the increase in the price of good x in part(iii)? Explain **(4 Marks)**

(b) Economists assume that well behaved indifference curves are convex. Briefly explain the meaning of convexity **(3 Marks)**

3. (a) A firm produces output using the technology

$$y = \frac{1}{1000}KL^{\frac{1}{2}}$$

Where capital, K, is measured in machine hours, labor, L, is measured in person-hours, and y denotes the yearly output. The hourly wage rate $w_l = 10$, and the hourly rental rate of capital is $w_k = 20$

(i) Does this technology display increasing, decreasing, or constant returns to scale?**(3 Marks)**

(ii) Compute the marginal products of labor and capital **(3 Marks)**

(iii) Suppose that at the end of 2017 the firm has signed acontract to rent $K = 1,000$ machine hours over the course of the year 2018. Derive the firm's short-run cost function in the year 2018 **(5 Marks)**.

1. Explain the properties of a well behaved indifference curves **(9 Marks)**

4. (a) Explain any three sources of monopoly power **(9 Marks)**

(b) A monopolist has an inverse demand curve given by $p(y) = 12 - y$ and a cost curve given by $c(y) = y^2$. Describe how to determine its profit maximizing level of output and compute it **(5 Marks)**

(c) A company sells product A in a competitive market. its long-run cost function is given by

$$c(y) = y^2 + 10 \text{ for } y > 0$$
$$c(y) = 0 \text{ for } y = 0$$

Where y represents the quantity of good A. What is the lowest price at which this company will supply a positive amount of product A in the long-run **(6 Marks)**

5. (a) Elvis and Miriam both love listening to MP3s (x_1) and watching DVDs (x_1). Their initial endowments are $\omega^E = (10, 10)$ and $\omega^M = (90, 0)$. Utility functions of Elvis and Miriam are the same and given by;

$$u^i(x_1, x_2) = lnx_1 + 5lnx_2$$

(i) What are the total resources in the economy with Elvis and Miriam **(2 Marks)**

(ii) plot an edgeworth box for the considered economy and Mark a point that corresponds to the initial endowments.Verify whether that initial allocation is pareto efficient **(6 Marks)**

(ii) Find analytically the contract curve **(5 Marks)**

(iii) Find a competitive equilibrium allocation **(7 Marks)**