



FACULTY OF MANAGEMENT AND ADMINISTRATION

COURSE TITLE: MEC 201- INTERMEDIATE MICROECONOMICS

SEMESTER 1: FINAL EXAMINATION NOVEMBER 2014

LECTURER: MR. L. NGENDAKUMANA

TIME: 3 HOURS

INSTRUCTIONS

Answer **all** questions in section A and **any two** questions in section B.
Total possible mark is **100**.

Start **each** question on a new page in your answer booklet.

The marks allocated to **each** question are shown at the end of the section.

Show all your workings.

Credit will be awarded for logical, systematic and neat presentations.

SECTION A

Question 1

(i) After explaining the concept of short- run production:

- Describe the three stages of production and how they relate to the concept of diminishing marginal returns. You should use total product, marginal and average product of capital graphs in your explanations. [4]
- Derive any six key relationships among the total, marginal and average product of capital. [Use appropriate diagrammatical tools in your illustrations]

[4]

- “Firms operate in the short run but make their decisions in the long run.” Do you agree or disagree with this assertion? Explain [4]

(ii) Consider a Cobb-Douglas production function that shows a production of textiles in Madagascar $Q = F(K, L)$

Where Q is output, K is capital input and L is labour input.

The following table shows the various input rates and the attained output(s)

*Rate of
Capital input
(K)*

8	283	400	490	565	632	693	748	800
7	265	374	458	529	592	648	700	748
6	245	346	424	490	548	600	648	693
5	224	316	387	447	500	548	592	632
4	200	283	346	400	447	490	529	565
3	173	245	300	346	387	426	458	490
2	141	200	245	283	316	346	374	400
1	100	141	173	200	224	245	265	283

1 2 3 4 5 6 7 8

Rate of labour input (L)

Inferring from the above table:

- Suppose that the price of capital is \$ 75 per unit and the price of labor is \$18 per unit, compute all possible total cost of producing 283 units of output. [2]
- Suppose that the price of capital increases to \$ 95 per unit and the price of labor falls to \$14 per unit, answer question (a). [2]
- Explain and illustrate the concept of “**Returns to scale**”, with reference to the Cobb- Douglas production function and use a clear demonstration on how to verify types of returns to scale can be derived. [4]
- Explain how the marginal product of labor is related to the total product of labor and how it is measure [4]

- e. After outlining and explaining the condition of employment of 2 factor inputs (in a given long- run production function) Use a numerical example to show when such condition holds [4]

Question 2

(i) The demand for computers by the Faculty of Management and Administration at Africa University is given by:

$$Q = 100\,000 - 200P$$

The book is initially priced at \$200

- (a) compute the point elasticity of demand at $P = \$200$. Interpret your result [3]
- (b) If the objective is to increase total revenue, should the price of computers be increased or decreased? Explain. [2]

(ii) Manhanga maximizes her utility by spending her entire income on goods A, B and C (whose prices remain constant in this problem). He makes \$ 300 per week and purchases 10 units of good A, 10 units of good B, and 10 units of good C. When Chipu's income rises to \$400 per week, she buys 14 units of good A, 9 units of good B and 17 units of good C. Finally, when Chipu gets another pay increase to \$ 500 per week, she purchases 16 units of good A, 8 units of good B and 26 units of good C.

- a. Using this information, graph the relationship between income and purchases of goods A, B and C. [6]
- b. Explain the nature of each good: is it normal or inferior? A luxury or a necessity? [3]

Question 3

Tatenda has a monthly income of m dollars to spend on two commodities X and Y. The prices per unit of X and Y are \$4 and \$2 respectively. The utility he enjoys by consuming X and Y units is given by: $U = \sqrt{xy}$.

- a. Find the optimal values of x and y as well as the Lagrangean multiplier that solve the maximization problem. [5]
- b. Find the optimal values of x and y as well as the Lagrangean multiplier that solve the maximization problem given an income level of 8000 dollars [3]
- c. Use the concept of homogeneity explain how it can best be applied in part (b) results [2]

SECTION B

Question 4

- (i) a. Using a well labeled diagram and a numerical example of a consumer's demand function [of a given commodity], make all necessary assumptions to show and explain the substitution and income effects from an decrease in a normal good's price. [6]
- b. Suppose the government charges a 25 % ad valorem tax on the commodity you have chosen in (a). Assess how this policy would affect the consumer's consumption level at the new price level. [2]
- c. State and explain the "Slutsky identity " and show how it relates to the income and substitution effects [Use algebraic tools in your illustration] [2]

Question 5

- a. Use algebraic techniques to explain the concept of " nature and objective of the firm". [3]
- b. Suppose that a firm has the production function $Q = 20K^{\frac{1}{2}}L^{\frac{1}{2}}$. Currently, the firm is using 144 units of capital and 225 units of labour. Given the very specialized nature of capital equipment, it takes nine to twelve months to increase the capital stock, but the rate of labour input can be varied daily. If the price of labour is \$ 12 per unit and the price of output is \$5 per unit:
- (i) Is the firm operating efficiently in the short-run? [2]
- (ii) If not explain why and determine the optimal rate of input [2]
- c. Using algebraic tool, demonstrate and explain the condition for optimal employment of two factor inputs with reference to long- run production function involving the capital and labour inputs. [3]

Question 6

- a. Distinguish between a perfectly competitive and monopoly markets using their most salient characteristics and owing to their respective pricing mechanisms. [3]
- b. "If a natural monopolist operates where price equals marginal cost, then it will produce an efficient level of output, but it will be unable to cover its costs." Assess this statement using a well labeled diagram in your arguments [2]
- c. "Economic theory predicts that price is higher, and the rate of output lower for a monopoly than for perfectly competitive market", true or false? Use a numerical example in your explanations [3]
- d. Use theories on regulated monopoly, its pricing mechanism and numerical examples to explain the concept of economic profit [2]

End of paper