# UNIVERSITY OF RUHUNA

## Faculty of Engineering

End-Semester 3 Examination in Engineering: October 2019

**Module Number: IS3301** **Module Name: Basic Economics**

**[Three Hours]**

[Answer **all the questions**, each question carries ten marks]

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Q1 a) Define scarcity and opportunity cost. What role do these two concepts play in the making of management decisions?

[02 Marks]

b) The following relations describe monthly demand ($Q^D$) and supply ($Q^S$) for a computer support service catering to small businesses.

$$Q^D = 3{,}000 - 10P$$

$$Q^S = -1{,}000 + 10P$$

where Q is the number of businesses that need services and P is the monthly fee, in dollars.

i. What is the equilibrium price/output level?

[02 Marks]

ii. Suppose demand increases and leads to a new demand curve:

$$Q^D = 3{,}500 - 10P$$

What is the effect on supply? What are the new equilibrium P and Q?

[02 Marks]

iii. Suppose new suppliers enter the market due to the increase in demand and so the new supply curve is $Q^S = -500 + 10\,P$. What are the new equilibrium price and equilibrium quantity?

[02 Marks]

iv. Plot the original supply and demand curves and show the changes mentioned in Part ii and iii on the graph.

[02 Marks]

Q2 You are choosing between two goods, X and Y, and your marginal utility from each is as shown in the table below. If your income is Rs. 900 and the prices of X and Y are Rs. 200 and Rs. 100, respectively.

| Number of Units | $MU_X$ | $MU_Y$ |
|---|---|---|
| 1 | 10 | 08 |
| 2 | 08 | 07 |
| 3 | 06 | 06 |
| 4 | 04 | 05 |
| 5 | 03 | 04 |
| 6 | 02 | 03 |

i. What quantities of each will you purchase to maximize utility?

[02 Marks]

ii. Assume that, other things remaining unchanged, the price of X falls to Rs.100. What quantities of X and Y will you now purchase?

[02 Marks]

iii. Using the two prices and quantities for X, derive a demand schedule (price-quantity-demanded table) for X.

[02 Marks]

iv. Using the utility-maximization rule as your point of reference, explain the income and substitution effects of a decrease in the price of product X, with no change in the price of product Y.

[04 Marks]

Q3 a) Define the law of diminishing returns. Why is this law considered as a short-run phenomenon?

[02 Marks]

b) A firm has the following short-run production function:

$Q = 50L + 6L^2 - 0.5L^3$

where $Q$ = Quantity of output per week

$L$ = Labor (number of workers)

i. Derive the Average Product (AP) and Marginal Product (MP) functions.

[01 Mark]

ii. When does the law of diminishing returns take effect?

[01 Mark]

c). Explain the relationship between a firm's short-run production function and its short-run cost function. Focus on the marginal product of an input and the marginal cost of production.

[02 Marks]

d). You are given the following cost function: $TC = 100 + 60Q - 3Q^2 + 0.1Q^3$

i. Derive the average variable cost, average cost, and marginal cost for each function.

[03 Marks]

ii. Find the point at which diminishing returns occur.

[01 Mark]

Q4. Your firm has an opportunity to make an investment of Rs. 50,000. Its cost of capital is 12 percent. It expects after-tax cash flows (including the tax shield from depreciation) for the next 5 years to be as follows:

| Year | Cash Flows (Rs.) |
|---|---|
| 1 | 10000 |
| 2 | 20000 |
| 3 | 30000 |
| 4 | 20000 |
| 5 | 5000 |

a) Calculate the Net Present Value (NPV). [04 Marks]

b) Calculate the Internal Rate of Return (IRR) (to the nearest percent). [04 Marks]

c) Would you accept this project? [02 Marks]

Q5 a) For a hypothetical economy following functions are given:

| | |
|---|---|
| Consumption function: | $C = 400 + 0.6\,Y$ |
| Planned Investment function | $I = 200$ |
| Government purchases function | $G = 250$ |
| Net export function | $NX = -50$ |

i. Calcuate the Equilibrium National Income

[02 Marks]

ii. Determine the amount of savings at the Equlibrium National Income

[02 Marks]

iii. Calcuate the size of the Multiplier

[02 Marks]

b) Explain following terms by using examples and graphs.

i. Demand-Pull Inflation

[02 Marks]

ii. Cost-Push Inflation

[02 Marks]

Q6 a) What is meant by Comparative Advantage in international trade? [02 Marks]

b) Following table summarizes the production related information of two countries;

| | Country A | Country B |
|---|---|---|
| | Quntity Per Hour | Quntity Per Hour |
| Product X | 60 | 12 |
| **Product Y** | 60 | 72 |

i. Which country has the comparative advantages for producing Product X. Justify your answer.

[02 Marks]

ii. Which country has the comparative advantages for producing Product Y. Justify your answer.

[02 Marks]

iii. Show the gain from trade for each country assuming that each country produces half of each in absence of trade and in presence of specialization 50% of the production is sold to the other country.

[02 Marks]

c. Explain briefly by using a grapgh how the govenment of Sri Lanka can use import tariffs to protect Sri Lankan potato farmers.

[02 Marks]