

**NATIONAL UNIVERSITY OF SCIENCE AND
TECHNOLOGY
FACULTY OF COMMERCE
DEPARTMENT OF BANKING
BACHELOR OF COMMERCE HONOURS DEGREE IN
BANKING
APPLIED ECONOMICS I
CBA 4103**

SUPPLEMENTARY EXAMINATION

OCTOBER 2009

TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATES

- The paper contains **SIX (6)** questions.
- Answer any **FOUR (4)** questions.
- All questions carry equal marks [**25 marks**].
- Start the answer to each question on a fresh page of the answer sheet.
- Indicate on your answer booklet whether you are in the conventional or parallel programme.

INFORMATION FOR CANDIDATES

Questions may be written in any order, but must be legibly numbered.

The businesses in this question paper are intended to be fictitious.

This paper consists of 4 printed pages
Copyright: National University of Science and Technology

Turn over

QUESTION ONE

- a) Given the Total Cost function: $C = Q^3 - 5Q^2 + 14Q + 75$, write out the Variable Cost (**VC**) function. Find the derivative of the **VC** function, and interpret the economic meaning of that derivative. [7 marks]
- b) From the following average cost (AC) function: $AC = Q^2 - 4Q + 214$, find the MC function and then plot both the AC and MC functions. What is the relationship between the AC and MC functions? [9 marks]
- c) Find the total revenue (**TR**) function and the **MR** function mathematically from the Average Revenue function: $AR = 60 - 3Q$. Plot the **AR** and the **MR** curves. [9 marks]

TOTAL

[25 MARKS]

QUESTION TWO

- a) Let the **AR** function of a firm be defined as: $AR(Q) = 1200 - 2Q$ and the Total Cost be defined as $C(Q) = Q^3 - 60Q^2 + 1500Q + 200$
- i. Calculate the optimal level of production for the firm and the corresponding profit. [10 marks]
Test whether the corresponding profit is a maximum or minimum [5 marks]
- b) A firm produces two different types of a commodity. The daily costs of producing **X** units of commodity **A** and **Y** units of commodity **B** are: $C(x;y) = 0,04x^2 + 0,01xy + 0,01y^2 + 4x + 2y + 500$
Suppose that the firm sells all its output at a price per unit of \$15 for **A** and \$9 for **B**, find the production levels of **X** and **Y** that maximize profits. [10 marks]

TOTAL

[25 MARKS]

QUESTION THREE

Given the national income model of $Y = C + I_0 + G_0$

$$C = a + bY \quad [a > 0; 0 < b < 1],$$

where Y and C are endogenous variables on one hand and I_0 & G_0 are exogenously determined investment and government expenditures on the other hand.

- a) Explain the parameters a and b in the model above
[4 marks]
- b) Establish the static (equilibrium) values of national income (Y) and consumption (C) and clearly explain your results.
[9 marks]
- c) Investigate, using comparative static analysis the impact of government expenditure and the marginal propensity to consume (MPC) on the equilibrium income.
[12 marks]

TOTAL

[25 MARKS]

QUESTION FOUR

Suppose a government agency is given an annual budget of B_0 and is charged with the responsibility of providing as much service to the community as possible. It employs capital (k) and labour (l) in the production process.

- i. Given that $Q = f(K, L) = 32L^{0.5}K^{0.5}$, $r = 4$, $w = 6$, $B_0 = 200$; where w is the wage rate and r is the cost of capital
- ii. Write the Lagrangean function
[2 marks]
- iii. Determine, using the Lagrangean multiplier, the value of the capital and labour that optimizes output (Q).
[10 marks]
- iv. Find the optimal value of Q .
[4 marks]
- v. Estimate the effect of increasing the budget to **240**.
[6 marks]

Give an economic interpretation of the Lagrangean multiplier obtained in (a) above.
[3 marks]

TOTAL

[25 MARKS]

QUESTION FIVE

- a) It is often the case that those poor countries save less than richer countries and have a high proportion of young people.
i. Use the life cycle hypothesis of consumption to explain this fact. [5 marks]

Also what would be the effect of the social security system on the average propensity to consume? [4 marks]

- b) What are the effects on current and future consumption of
i. An income windfall expected in the future [4marks]
ii. High current interest rates [4 marks]
- c) In terms of permanent income hypothesis, would you consume more of your Christmas bonus if
i. You knew there was a bonus every year [4 marks]
ii. This was the only year such a bonus was given out. [4 marks]

TOTAL [25 MARKS]

QUESTION SIX

Is there any relation between the neoclassical theory of investment and the way firms make their investment decisions in practice?

TOTAL [25 MARKS]