RIARA SCHOOL OF BUSINESS

NURTURING INNOVATORS

SEPTMBER-DECEMBER 2022 TRIMESTER

EXAMINATION FOR BACHELOR OF BUSINESS ADMINISTRATION

DAY PROGRAMME

RFN 103 QUANTITATIVE METHODS FOR BUSINESS DECISION MAKING

DATE: 7TH NOVEMBER 2022 **TIME: 2 HOURS**

SPECIAL INSTRUCTIONS

1. Write your REGISTRATION NO. Clearly on the answer booklet(s).
2. Answer Question One and ANY other TWO questions.
3. Questions in all sections should be answered in answer booklet(s).
4. PLEASE start the answer to EACH question on a NEW PAGE.
5. For the questions, write the number of the question on the answer booklet(s) in the order you answered.
6. Write on both sides of each leaf and indicate number of each question at the top of each page.
7. Write the answers in paragraph form unless stated otherwise.
8. Marks allocated to each question are shown at the end of the question.
9. All rough work must be done on the answer booklet and crossed through!
10. Use supplementary pages only when you have exhausted those in this booklet.
11. Fasten the supplementary pages to the inside back cover of this booklet.
12. are only allowed to leave the examination room 30minutes to the end of the Examination.

QUESTION ONE (COMPULSORY – (30 MARKS)

(a) Solve the simultaneous equation following by substitution method; **(5marks)**

$4x + 3y = 11$

$2x + y = 5$

(b) To buy a house, Tom borrowed $50,000 for 5 years at an annual simple interest rate of 8%. How much interest will he pay if he pays off the entire loan at the end of the fifth year? (**3 marks)**

(c) A monopoly faces the following TR and TC schedules:

$TR = 300q - 2q^2$

$TC = 12q3 - 44q^2 + 60q + 30$

i) What output should it sell to maximize profit **(7 marks**)

ii) Calculate actual profit at the output determined in (i) above **(3 marks**)

iii) What output will maximize total revenue (3 **marks**)

(d) Solve for X, Y and Z using elimination method when **(9 marks)**

$x + 3y - z = 4$

$2x + y + 2z = 10$

$3x - y + z = 4$

QUESTION TWO

(a) The demand and cost function for a certain product are given as follows: Demand, $5625-3p^2$ and Cost, $500+864q$.

i. Derive the revenue and profit functions **(5 marks)**

ii. Compute the maximum revenue using the revenue maximizing sales units **(5 marks)**

(b) Find the fourth derivative of the function $y = 3x^6 - 2x^{-2} + 4x^2 + 5x$ **(5 marks)**

(c) Given the demand schedule $p = 120 - 3q$

i) derive a function for MR and **(3 marks)**

ii) find the output at which TR is a maximum **(2 marks)**

QUESTION THREE

a) Solve the simultaneous equation following by substitution method **(4marks)**

$2x + y = 8$

$3x - 2y = -2$

b) A company manufactures a product that has a unit selling price of Ksh.20 and a unit cost of Ksh.15. If fixed costs areKsh.600,000, determine the least number of units that must be sold for the company to have a profit. **(6marks)**

c) A manufacturer knows that if x (thousand) products are demanded in a certain month. The total cost function in (Ksh. 000) is $14 + 3x$ and the total revenue function in (Ksh.000) is $19x - 2x^2$. Calculate the level of demand that maximizes profit (the maximum profit) and the amount of profit obtained. **(10marks)**

QUESTION FOUR

(a) The equilibrium prices P1 and P2 for two goods satisfy the equations

$9P_1 + P_2 = 43$

$2P_1 + 7P_2 = 57$

Find the values of P_1 and P_2. **(5 marks)**

(b) Given revenue function is R= $28q - q^2$, Variable cost per unit is V= $q - 8$ and Fixed cost is sh 64

Determine the following:

(i) Total cost function **(3 marks)**

(ii) Profit function **(3 marks)**

(iii) Output and price for a maximum profit **(5 marks)**

(iv) Break- even point **(4 marks)**