NURTURING INNOVATORS

RIARA SCHOOL OF BUSINESS

JANUARY – APRIL 2025 TRIMESTER

EXAMINATION FOR DIPLOMA IN BUSINESS ADMINISTRATION

DAY PROGRAMME

RBM 012: INTRODUCTION TO BUSINESS MATHEMATICS

APRIL 2025 **TIME: 2 HOURS**

GENERAL INSTRUCTIONS:

Students are NOT permitted to write on the examination paper during reading time.

This is a closed book examination. Text book/Reference books/notes are not permitted.

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. Marks allocated to each question are shown at the end of the question.
5. PLEASE start the answer to EACH question on a NEW PAGE.
6. For the questions, write the number of the question on the answer booklet(s) in the order you answered them.
7. Write your answers in paragraph form unless stated otherwise.
8. Keep your phone(s) SWITCHED OFF at the front of the examination room.
9. Keep ALL bags and caps at the front of the examination room and do not refer to any unauthorized material before or during the course of the examination.
10. You are only allowed to leave the examination room 30minutes to the end of the Examination.

QUESTION ONE – COMPULSORY (30 MARKS)

a) Simplify the following expressions, factorising the answers where possible.

(6 Marks)

i). $p(2q + r + 3s) - pr - s(3p + q)$

ii). $x(x - 1) + 2(x - 1) - x(x + 1)$

b) If $f(x) = x^2 - 4x + 3$, find the value of x when $f(x) = 0$. **(4 Marks)**

c) Miriam and Saloma are twins and their sister Rohana is 2 years older than them. The total of their ages is 32 years.

i). Write this information in the form of an equation for r, Rohana's age in years.

(6 Marks)

ii). What are the ages of the three girls? **(4 Marks)**

d) Consider the following two matrices, A and B:

$$\mathbf{A} = \begin{pmatrix} 3 & 5 & \frac{1}{2} & 4 \\ 4 & -1 & 2 & 0 \end{pmatrix} \qquad \mathbf{B} = \begin{pmatrix} -1 & 4 & 0 & 3 \\ 0 & 2 & 1 & 5 \end{pmatrix}$$

Find A + B and A – B **(4 Marks)**

e) Find the future value and compound interest on a $6000 investment at 10% compounded semi-annually for 6 years. **(6 Marks)**

QUESTION TWO

a) Define a variable and distinguish it from a constant. **(4 Marks)**

b) Solve the following Equations: **(6 Marks)**

i). $5(2d + 8) = 2(3d + 24)$

ii). $3(2h - 6) - 6(h + 5) = 2(4h - 4) - 10(h + 4)$

c) In 18 years' time, Hussein will be five times as old as he was 2 years ago.

i). Write this information in the form of an equation involving Hussein's present age, **a** years. **(6 Marks)**

ii). How old is Hussein now? **(4 Marks)**

QUESTION THREE

a) Make m the subject in $E = mgh + \frac{1}{2} 2mv^2$. **(6 Marks)**

b) A cylindrical tin of height h cm and radius r cm, has surface area, including its top and bottom, A cm2.

i). Write down an expression for A in terms of r, h, and π. **(4 Marks)**

ii). A tin of height 6 cm has surface area 54π cm2. What is the radius of the tin? **(4 Marks)**

c) For the points P (x, y), and Q (3x, 5y), find in terms of x and y: **(6 Marks)**

i). The gradient of the line PQ

ii). The mid-point of the line PQ

iii). The length of the line PQ

QUESTION FOUR

a) Explain the difference between a quadratic equation and a linear equation. **(4 Marks)**

b) Factorise the following quadratic expressions. **(6 Marks)**

i). $x^2 + 6x + 8$

ii). $(x + 3)^2 – 9$

c) Use the quadratic formula to solve the equation $x^2 – 4x – 5 = 0$. **(6 Marks)**

d) The line joining the point P (3, −4) to Q (q, 0) has a gradient of 2. Find the value of q. **(4 Marks)**

END OF EXAM