CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

RESIT/SPECIAL EXAMINATION

EXAMINATION FOR THE AWARD OF DIPLOMA IN BUSINESS MANAGEMENT

DIBM 0122: BUSINESS MATHEMATICS II

STREAMS: **TIME: 2 HOURS**

DAY/DATE: MONDAY 17/09/2018   **11.30 A.M. – 1.30 P.M.**

INSTRUCTIONS:

- **Answer question one and other two questions**
- **Question one consists of 30 marks.**

QUESTION ONE

a. Mathematical technologies are irrelevant in business mathematics. Discuss. (5 marks)
b. Define the following terms as used in business mathematics.   (10 marks)
  i.   Permutation and combination
  ii.   Independent events and mutually exclusive events
  iii.   Column matrix and row matrix
  iv.   Subset and equal sets
  v.   Identity matrix and equal matrices
c. Using examples proof the laws of scalar multiplication   (8 marks)
d. A committee of 4 must be chosen from 3 women and 4 men   (5 marks)
  i.   Calculate in how many ways the committee can be chosen
  ii.   In how many ways 2 women and 2 men can be chosen.

e. Given the matrix   (2 marks)

$$\begin{bmatrix} 0 & 4 \\ 7 \\ 10 \end{bmatrix}$$

QUESTION TWO

a. Use crammer's rule to determine the value of unknowns in the following simultaneous equations;(10mks)

$x + y + z = 6$
$2y + 5z = 4$
$2x + 5y - z = 27$

b. Omondi invested Ksh. 20,000 for two years at an interest rate of 10% per annum compounded quarterly. How much money did he receive at the end of the 3rd year?

(5 marks)

c. A manufacturer knows that if x eggs are demanded in a particular week the total cost function and relevant function will be;

$TC = 140 - 8q + 0.5q^2$

$R.F = 600q - q^2 + 1000$

Required;

i.   Derive the total profit function.
ii. Determine the break-even point   (5 marks)

QUESTION THREE

a. A bag contains 5 white and 8 black balls. Two balls are drawn at random from the bag one at a time without replacement. Find the probability that the balls are white. (4 marks)

b. Proof that 0! = 1   (5 marks)

c. Find the determinant, cofactors and hence the inverse of the following matrix (11 marks)

A=
$$\begin{bmatrix} -2 & 7 \\ 2 & \\ 6 & -6 \end{bmatrix}$$

QUESTION FOUR

a. How long will it take ksh.1000 invested at 12% per annum compounded interest to ksh.3000?   (5 marks)

b. Use the matrix inverse method to solve the following simultaneous equations(15 marks)

$3x_1 + 4x_2 + 3x_3 = 60$
$4x_1 + 10x_2 + 2x_3 = 104$
$4x_1 + 2x_2 + 4x_3 = 60$