CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COSC 0170: MATHEMATICS FOR COMPUTING I

STREAMS: BSC (COMP. SCI)   **TIME: 2 HOURS**

DAY/DATE: MONDAY 09/12/2019   **2.30 P.M. – 4.30 P.M.**

INSTRUCTIONS:
- **Answer all questions in section A and any other two in section B**
- **Do not write anything on the question paper**
- **Non-programmable electronic calculators may be used**

SECTION A

QUESTION ONE (30 MARKS)

a) Classify the following numbers   (3 marks)

   i)

   ii)   -3.333

   iii)

b) State the properties of real numbers in the equations below   (2 marks)

   i) $(5+9)+7=5+(9+7)$

   ii)   If $5(4+6)=5(10)$, then $5(10)=5(4+6)$

c) Given $Z_1=3-4i$

$Z_2=5i-2$

$Z_3=-15i+6$

Find;   (6 marks)

   (i)

   (ii)

d) Solve $2x^2-2x=-1$ using completing square method   (2 marks)

e) Find the length of the line joining A and B in A(-1,6), B(3,-9) and its equation   (2 marks)

f) Find the radius and the centre of the circle given by

                            (3 marks)

g) How many arrangements are there in the letters of the given words   (2 marks)
   CORDINATION, COMMITMENT

h) Given

   , find;

                           (2 marks)

                           (2 marks)

i) Given U= (0, 3, 6, 9, 10, 12, 13)

       A= (0, 3, 10)

       B= (3, 10, 12)

       Find using the Venn diagram, i) AnB, ii) AuB, iii) $A^c uB^c$ (6 marks)

SECTION B

QUESTION TWO (20 MARKS)

a) Expand the following functions using appropriate method

   i) $(x+2y)^4$ (5 marks)

   ii) $(x-1/x)^6$ (5 marks)

b) Given $f(x)=2x^2+1$

g(x)=3x+4,

Find,

i) (2 marks)

ii) (2 marks)

iii) (3 marks)

iv) (3 marks)

QUESTION THREE (20 MARKS)

a) Define the following terms as used in elementary mathematical logic

i) Logical statement (2 marks)

ii) Truth table (2 marks)

iii) A simple statement (2 marks)

iv) A compound statement (2 marks)

b) Show that (6 marks)

c) Proof by commutative law that = (6 marks)

QUESTION FOUR (20 MARKS)

a) Find of $(2x^3-x^2+2)^5(x-2)^3$ (5 marks)

b) Find the radius and the centre of a circle that passes through points P(2,1),Q(0,5) and R(-1,2)
(10 marks)

c) Given   A={5,5,8,15}

B={5,5,10,12}

C=(5,8,10,20)Find,, and   with the help of a Venn diagram
(5 marks)

QUESTION FIVE (20 MARKS)

a) Find the quotient and the remainder of $(x^5+1) / (x-1)$, (4 marks)

b) Solve the following quadratic equations by any appropriate method.

i) (4 marks)

ii)   (4 marks)

c) A committee of 5 men and 4 women is to be formed from 8 men and 6 women. How many ways can this be done?   (4 marks)

d) Differentiate between a whole number and an integer giving relevant examples   (4 marks)