CHUKA UNIVERSITY

RESIT/ SPECIAL EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN APPLIED COMPUTER SCIENCE

ACMP 224-STRUCTURED PROGRAMMING

STREAMS: B.SC. (ACMP) **TIME: 2 HOURS**

DAY/DATE: TUESDAY 24/7/2018 **2.30 PM – 4.30 PM**

INSTRUCTIONS:

1. Answer question **ONE** and any other **TWO** questions
2. Marks are awarded for clear and concise answers

SECTION A

QUESTION ONE COMPULSORY (30 MARKS)

a) Define the following terms (4 marks)
   i) Array
   ii) Heap

b) Outline the four advantages of using arrays [4 marks]

c) Discuss three rules of naming variables [3 marks]

d) Enumerate three advantages of modular programming compared to procedural programming language. [3marks]

e) Explain the weakness of C approach towards problem solving. [3marks]

f) Discuss the stages of C program compilation. [4 marks]

g) Using a function write a program that adds and subtracts two numbers and displays the result. [6 marks]

h) Point out and correct the mistakes in the following variable names;
   i. switch
   ii. ?name
   iii. my name

QUESTION TWO (20 MARKS)

a) State any three characteristics of a good algorithm. [3 marks]

b) Briefly explain any three ways in which an algorithm can be represented [6 marks]

c) Write a program to print numbers from 10 to 50 and their squares. [6 marks]

d) Esbon wrote the C program below but did not run. Study it and rewrite the correct code by removing the errors [5marks]

```
#include<stdio.>
void main()
{
  int a, b, sum, product
  double 8average;
  printf("Enter a value for a\n”);
  scanf(“%d”,a);
  printf("Enter a value for b\n);
  scanf(“%d”,&c);
  sum = a + b;
  product=a*b;
  average = (double) sum/2;
  printf(“\n%d+%d=%d”,num1,num2,sum);
  printf("The average  is %4.2lf\n”);
  return 0;
)
```

QUESTION THREE (20 MARKS)

a) Clearly explain the following terms: [6 marks]
   i. Linking
   ii. Data type
   iii. Operand

b) The following code fragment is a pseudocode used to solve a computer problem

1. Declare the variables x, y, z and the result to be of type into (in separate statements).
2. Prompt the user to enter three integers.
3. Read three integers from the keyboard and store them in the variables x, y and z.
4. Compute the product of the three integers contained in variables x, y and z and assign the result to the variable result.
5. Print “the product is ” followed by the value of the variable result

I. Write a program to implement the above pseudocode. [10 marks]

II. Use a flowchart to implement the fragment in (ii) above. [4 marks]

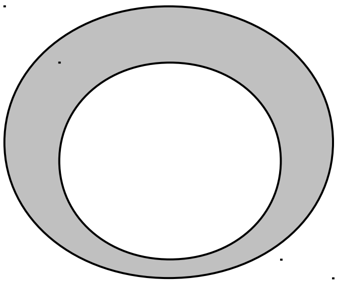
QUESTION FOUR (20 MARKS)

a) Using examples, discuss the three types of control structures as used in C programming language. [6 marks]

b) A person invests Kshs.1000, 000 in savings account yielding 5% interest. Assuming that all interest is left on deposit account, write a program will compute and display the interest after 5 years. [14 marks]

QUESTION FIVE (20 MARKS)

a) i) Design a flowchart to calculate area of the shaded part shown below [3 marks]



ii) Write a C program to solve the above problem. [3 marks]

b) Differentiate between an identifier and a keyword used in C programming and 2 examples in each case. [4 marks]

c) Write a C program that accepts two numbers and operator (+,-,/,*) computes the result depending on the operator entered, and then output the numbers, operator and the result. [6 marks]

d) Outline the function of the following C format specifier. [4 marks]

i) %c

ii) %f
iii) %s
iv) %d
