# JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

## SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

## UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION AND COMMUNICATION TECHNOLOGY/ BACHELOR OF SCIENCE IN BUSINESS INFORMATION SYSTEMS

## 1ST YEAR 1ST SEMESTER 2015/2016 ACADEMIC YEAR

## MAIN CAMPUS

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**COURSE CODE:** IIT 3112

**COURSE TITLE:** INTRODUCTION TO PROGRAMMING

**EXAM VENUE:**                 **STREAM:  ICT & BIS GROUP**

**DATE:  DECEMBER 2016**          **EXAM SESSION:**

**TIME: 2.00 HOURS**

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**INSTRUCTIONS:**

1. Answer Question 1 (Compulsory) and ANY other two questions
2. Candidates are advised not to write on the question paper
3. Candidates must hand in their answer booklets to the invigilator while in the examination room

**QUESTION ONE [30 MARKS]**

a) State and explain any three data types used in C programming. Give examples of how each is used in variable declaration.

[6 Marks]

b) Given the declaration *int sum [5];*
Explain why the following will give an error message if embedded in a program:
*int i;*
*for(i=0; i<=20; i+ +)*
*sum [i] =i;*                                                            [3 Marks]

c)
   i)   Define the term syntax                                          [2 Marks]
   ii)  Using an example, explain how you could cause syntax error.

[2 Marks]

d) Write a program for the meteorological centre that reads the noon day temperature (in degrees Celsius) for each day of a week and then reports the weeks average temperature as well as the hottest and coolest days.          [7 Marks]

e) Using *Case* and *Switch* control structure , write a C program that emulate a simple calculator.                                                    [10 Marks]

**QUESTION TWO [20 MARKS]**

a) Briefly discuss the principle of structured programming.          [3 Marks]

b) C programming language is considered to be a free form and a case sensitive language. Explain these two concepts.                              [4 Marks]

c) Briefly describe the stages of program development.              [6 Marks]

d) Identify the output of the following program:
```
#include <stdio.h>
void main ( )
{
int x =10;
float z, y =3.0;
z = x%y;
```

```
printf ("z=%f",z);
}                                                    [2 Marks]
```

e) Write a program that asks the user to enter two numbers and then divides the first number by the second one or multiplies them depending upon the operation requested by the user.                                    [5 Marks]

**QUESTION THREE [20 MARKS]**

a. The following are invalid variable names. Give reasons for each:
  i. name&
  ii. first-name
  iii. account.balance
  iv. switch
  v. ?variable
  vi. my variable                                    [3 Marks]

b. Define the following terms:
  i. Array
  ii. Data type                                      [4 Marks]

c. Using an example explain how an array can be declared
                                                     [3 Marks]

d. Rewrite the following mathematical statement in their equivalent C statements:
  i. $c = \dfrac{5}{6} (f\text{-}32)$                [1 Mark]

  ii. $T = 3x^2 + \dfrac{y}{(x^2+100)(x^2)}$         [3 Marks]

e. Write a program that reads four integer values from the keyboard and calculates their sum. Use two functions i.e. **main** and **getsum** to write the program, making appropriate function calls. The function **getsum** is used to calculate the sum.                        [6 Marks]

**QUESTION FOUR [20 MARKS]**

   a.  Briefly explain the following concepts as used in structured programming:
       i.  Modularity
      ii.  Algorithm
     iii.  Flow chart                                    [6 Marks]

   b.  Write a function prototype for a function called **Interest** that computes interest on an account balance. The function takes arguments for the initial balance, the monthly interest rate and the number of months for which interest must be paid. The value returned is the interest due.   [2 Marks]

   c.  Write a program that reads a number through the keyboard and determines if it is an odd or even number and prints either of the following messages: "ODD" or "EVEN".                        [4 Marks]

   d.  Draw a well-labelled flowchart for the program in c) above.  [4 Marks]

   e.  Identify the output of the following C program:

```
# include <stdio.h>
void main ( )
{
int x, y, z, i =0;
x =1;
y = 10;
while (i < 3)
{
x +=1;
y - =2;
z + =x +y;
i + +;
printf ("\nX=%5d, Y=%5d", x, y);
}
print f ("\nZ =%d",z);
}
```
                                                                [4 Marks]

**QUESTION FIVE [20 MARKS]**

a. Differentiate between compiler and interpreter. [2 Marks]

b. Rewrite the following **if…else** statement using a **switch** (**case**) statement:
```
if (point = =4)
    printf ("Distinction" );
else if (point = =3)
   printf ("Credit" );
else if (point = =3)
   printf ("Pass" );
else
   printf ("REPEAT" );                          [5 Marks]
```

c. Draw a flow chart to represent the syntax of each of the following loops:
   i.   do…while loop.
   ii.  while loop.                              [6 Marks]

d. Using parenthesis, clearly indicate the hierarchy of operations in the expression:
   **(i +j)/k*n%m-5*b**                          [3 Marks]

e. Write a program that uses a loop to sum numbers between 1 and 10 inclusive and then outputs the sum to the screen. The program has no input data.
                                                 [4 Marks]