UNIVERSITY EXAMINATIONS

EXAMINATION FOR JANUARY/APRIL 2015/2016 FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE

RCCS 107 INTRODUCTION TO PROGRAMMING

DATE 6TH APRIL 2016 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:

This examination paper consists Questions in Section A followed by section B.

Answer **Question 1 and any Other Two** questions.

QUESTIONS in ALL Sections should be answered in answer booklet(s).

1. **PLEASE start the answer to EACH question on a NEW PAGE.**
2. **Keep your phone(s) switched off at the front of the examination room.**
3. **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.**
4. **ALWAYS show your working.**
5. **Marks indicated in parenthesis i.e. ( ) will be awarded for clear and logical answers.**
6. **Write your REGISTRATION No. clearly on the answer booklet(s).**
7. **For the Questions, write the number of the question on the answer booklet(s) in the order you answered them.**
8. **DO NOT use your PHONE as a CALCULATOR.**
9. **YOU are ONLY ALLOWED to leave the exam room 30minutes to the end of the Exam.**
10. **DO NOT write on the QUESTION PAPER. Use the back of your BOOKLET for any calculations or rough work.**

SECTION A (COMPULSORY)

Question One (30marks)

a. Define the following terms as used in programming and use an example for each to demonstrate your understanding. (**5marks**)
   i. Preprocessor Directive
   ii. Algorithm
   iii. Header file
   iv. Datatype
   v. Identifier

b. State the order of precedence of the arithmetic operators. **(3marks**)

c. Write a single C++ statement to accomplish each of the following:

   i) Declare the variables **c**, **thisIsAVariable**, **q76354** and **number** to be of type **int**. **(2marks)**

   ii)Prompt the user to enter an integer. End your prompting message with a colon (:) followed by a space and leave the cursor positioned after the space. **(2marks)**

   iii)Read an integer from the user at the keyboard and store it in integer variable age. **(2marks)**

   iv)If the variable **number** is not equal to 7, print "The variable number is not equal to 7". **(2marks)**

   v) Print the message "This is a C++ program" on one line. **(2marks)**

d. Write a program that accepts three numbers and calculates the product and sum, displays results. **(5marks)**

e. The following program demonstrates the use of a control structure.

```
#include <iostream>
using namespace std;
 int main ( )
{
int n;

        switch ( n )
        {
        case 1:
        cout << "The number is 1" << endl;
        case 2:
        cout << "The number is 2" << endl;
        break;
        default:
        cout << "The number is not 1 or 2" << endl;
        break;
        }
        Return 0;
}
```

   i. Name the type of control structure used by the above program. **(1mark)**

   ii. Use an if…then/Else statement for the above program **(4marks)**

iii. What is the purpose of using **Break** and **Default** in the program? **(2marks)**

SECTION B (ANSWER ANY TWO QUESTIONS)

Question Two (20marks)

a. Define the three different iterative control structures used stating their syntax. Use an example for each stated. **(10marks)**
b. Differentiate between the following terms and give examples for each.
   i. Pre-decrement and post-decrement **(4marks)**
   ii. Arithmetic and Relational operators **(4marks)**

c. State the outcome of the following statements.
   i. !(5 == 5) **(1mark)**
   ii. !(6 <= 4) **(1mark)**

Question Three (20marks)

a. Describe the two types of functions present in programming. **(4marks)**
b. Outline the purpose of the following keywords as used in programming. **(5marks)**
   i. Char
   ii. Constant
   iii. Struct
   iv. Formal parameter
   v. Sentinel value
c. Write a program that generates the following series: 2, 4, 6, 8, 10, 12 …20. Use a loop of your own choice. **(5marks)**
d. State the four essentials of a loop control structure. **(4marks)**
e. What is a function overload? **(2marks)**

Question Four (20marks)

a. Study the program below and answer the questions that follow.

```
int primes[10] = { 2, 3, 5, 7, 11, 13, 17, 19, 23, 29 };

cout << primes[4] << endl;
```

   i. What is an array? **(1mark)**
   ii. What type of array is it? (**1mark**)
   iii. What is the output of the array? (**1mark**)
b. Study the statements below (*Correct the Code Errors)* Identify and correct the error(s) in each of the following:

```
i) if ( age >= 65 );
cout << "Age is greater than or equal to 65" << endl;
else
cout << "Age is less than 65 << endl";
```

(2marks)

ii) if (age >= 65)
cout << "Age is greater than or equal to 65" << endl;
else;
cout << "Age is less than 65 << endl"; **(2marks)**

iii) int x = 1, total;
while (x <= 10)
{
total =+ x;
++x;
} **(2marks)**

iv) While (x <= 100)
total += x;
++x; **(2marks)**

v) while (y > 0)
{
cout << y << endl;
++y; **(2marks)**

c. Write a program that accepts any positive number and adds it to sum otherwise the number is not added to sum since it is negative. **(5marks)**
d. Write a function that calculates the area of a circle. $Area = \pi r^2$ **(5marks)**

Question Five (20marks)

a. The following functions are used in programming. Explain their importance **(6marks)**

   i. put
   ii. get
   iii. write

b. State four advantages of using pointers as data structures in a program **(4marks)**
c. Define the term enumeration as used in programming. Give an example to demonstrate your understanding. **(4marks)**
d. Illustrate your understanding on the following terms as used in programming.
   i. Data hiding **(2marks)**
   ii. Polymorphism **(2marks)**
   iii. Object **(2marks)**