



UNIVERSITY EXAMINATIONS

EXAMINATION FOR SEPTEMBER/DECEMBER 2019/2020 FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE/BACHELOR OF BUSINESS IN INFORMATION TECHNOLOGY

RCS 107: INTRODUCTION TO PROGRAMMING

DATE: December 2019

TIME: 2 HOURS

GENERAL INSTRUCTIONS:

Students are NOT permitted to write on the examination paper during examination 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-ANSWER ALL QUESTIONS)

Question One (30marks)

- a. Define the following terms as used in programming and use an example for each to demonstrate your understanding. **(10marks)**
- Constant
 - variable
 - Header file
 - Datatype
 - Identifier
- b. Use C or C++ to write a statement(or comments) to accomplish each of the following:
- State that a program calculates the product of three integers. **(1mark)**
 - Declare the variables x, y, z and result to be of type int (in separate statements). **(3marks)**
 - Prompt the user to enter three integers. **(3marks)**
 - Read three integers from the keyboard and store them in the variables x, y and z. **(3marks)**
 - Compute the product of the three integers contained in variables x, y and z, and assign the result to the variable **result**. **(2marks)**
 - Print "The product is" followed by the value of the variable result. **(1mark)**
 - Return a value from main indicating that the program terminated successfully. **(1mark)**
- c. Using the statements you wrote in **question (b)** write a complete program that calculates and displays the product of three integers. Add comments to the code where appropriate **(6marks)**

SECTION B (ANSWER ANY TWO QUESTIONS)

Question Two (15marks)

- a. Define any three different selection control structures used in programming stating their syntax. Use an example for each. **(9marks)**
- b. State the similarities between the following terms and give examples for each.
- Pre-decrement and post-decrement **(2marks)**
 - Logical operators and Relational operators **(2marks)**
- c. State the outcome of the following statements.
- `!(7 == 5)` **(1mark)**
 - `!(6 <= 8)` **(1mark)**

Question Three (15marks)

- a. Describe the two types of functions present in programming. **(2marks)**
- b. Outline the purpose of the following keywords as used in programming. **(5marks)**
- Char
 - Class
 - Struct

- iv. Formal parameter
- v. Actual Parameter
- c. Write a program that generates the following series: 1, 2, 3, 4, 5, 6, ...20. Use a loop of your own choice. **(4marks)**
- d. State the four essentials of a loop control structure. **(4marks)**

Question Four(15marks)

- 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[6]<<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 and state the output of each of the following:
 - i.

```
int x = 2, total=0;
while ( x <= 10 )
{
total += x;
++x;
}cout<<total;
```

(1marks)
 - ii.

```
int x = 80, total=0;
While ( x<= 100 ){
total += x;
++x;
} cout<<total;
```

(1marks)
- 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(15marks)

- a. Define the term pointer as used in programming. Give an example to demonstrate your understanding. **(3marks)**
- b. Illustrate your understanding on the following terms as used in programming.
 - i. Data hiding **(2marks)**
 - ii. Polymorphism **(2marks)**
 - iii. Object **(2marks)**
 - iv. Inheritance **(2marks)**
 - v. Abstraction **(2marks)**
 - vi. Message passing **(2marks)**