



**RAJARATA UNIVERSITY OF SRI LANKA  
FACULTY OF APPLIED SCIENCES**

**B.Sc. (General) Degree in Applied Sciences  
First Year - Semester I Examination – March 2021**

**COM 1407 – COMPUTER PROGRAMMING**

**Time: Three (03) hours**

- There are five (05) questions in four (04) pages.
- Answer **ALL** questions.
- Use C Language where necessary.

1. a) What is computer programming? (02 marks)
- b) “In structured programming, it states that it is possible to write any computer program by using only three basic control structures”. Name these three control structures. Explain them briefly. (06 marks)
- c) What is a header file? (03 marks)
- d) The given program is unnecessarily complicated. Simplify it as much as possible. (05 marks)
 

```

      if(age >=13)
        if(age<=19)
          teenager = 1; //true
        else
          teenager =0; //false
      else if(age <= 13)
        teenager=0; //false
      
```
- e) In C programming “=” and “==” operators have different meanings. Explain. (04 marks)

2. a) Suppose that 'i' is a variable of type int. 'f' is a variable of type float and 'd' is a variable of type double. Explain what conversions take place during the execution of the following statement. Differentiate between explicit and implicit type conversions.

`d = i + f;`

(05 marks)

- b) Explain the scopes of following types of variables.

- i. Local variables
- ii. Global variables
- iii. Formal parameters

(06 marks)

- c) Write a C program defining a constant as PI to calculate and print the perimeter of the circle ( $C=2\pi r$ ) by taking user input for radius.

(05 marks)

- d) Write the expected outputs of following C statements.

- i. `x=1.254;`  
`printf("x=%2d");`
- ii. `x=0; y=5;`  
`printf("%d %d %d", ++x + --y, x, --y);`

(04 marks)

3. a) Which of the following statements is not equivalent to the other two (Assuming that the loop bodies are same). Justify your answer.

- i. `while(i<10){}`
- ii. `do{} while(i<10);`
- iii. `for(;i<10;){...}`

(05 marks)

- b) Compare and contrast break and continue statements with two examples.

(04 marks)

- c) What is the output of the following code?

```
int i, j;

for (i = 0; i <= 3; i = i + 1)
{
    for (j = 0; j <= 4; j = j + 1)
    {
        if ( (i + 1 == j) )
        {
            printf ("+");
        }
        else
        {
            printf ("o");
        }
    }
    printf ("\n");
}
```

(05 marks)

- d) Rewrite the following program, correcting all the errors.

```
include (stdio.h)

main{ } // Program execution begins here
(
    people, legs integer;

    print ("How many people are there?/n);
    scanf ("%d", people);
    legs = people * 2
    print ("There are %f legs.");
    Return 0
```

(06 marks)

4.
  - a) Write a C function that takes three integers as arguments and returns the largest value. (05 marks)
  - b) State two advantages of using recursive functions. (02 marks)
  - c) Describe two different ways a parameter can be passed into a function in C, with examples. (04 marks)
  - d) What do you mean by a prototype of a function? State the components which should be included in the function prototype. (03 marks)

- e) Identify the purpose of following functions. Give one example for each.
- i. gets()
  - ii. getchar()
  - iii. scanf()
- (06 marks)
5. a) Explain the advantages of using an array to store a set of data items instead of using multiple variables. (04 marks)
- b) What is the relationship between arrays and pointers? Explain using an example. (04 marks)
- c) Declare an array of floats with two indices, such that the first index can take values 0 to 9 and the second can take values 0 to 12. (02 marks)
- d) What is a structure in C? Discuss the advantages of using structures. (04 marks)
- e) Create a structure containing reference number, book title and author of a book. Create a typedef named Book\_Record that can be used to create instances of this structure. (06 marks)

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