RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. in Applied Sciences
First Year - Semester I Examination – June/July 2022

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) Define what a computer program is. **(02 marks)**

   b) Name the phases of Program Development Life Cycle (PDLC) briefly explaining each. **(06 marks)**

   c) What is the purpose of using *#include* directive in C programming? **(03 marks)**

   d) The given program is unnecessarily complicated. Simplify it as much as possible.

```
if(age >=13)
        if(age<=19)
                teenager = 1;  //true
        else
                teenager =0;  //false
else if(age <= 13)
        teenager=0;  //false
```

(05 marks)

   e) In C programming "=" and "= =" operators bear different meanings. Explain. **(04 marks)**

2. a) Describe how type promotion/ automatic casting takes place in C with a suitable example. **(05 marks)**

b) Compare and contrast local and Global variables **(06 marks)**

c) Declare an integer variable named "*location*" and assign value 200 to it. Then create a pointer variable "*m*" pointing to it and print the value of "*location*" using the pointer. **(05 marks)**

d) Write the expected output of following code snippet. Justify your answer

```
int main(){
        int color=2;
        switch(color)
        {
                case 0: printf("Black");
                case 1: printf("Blue");
                case 2: printf("Green");
                case 3: printf("Aqua");
                default: printf("Other");
        }
        return 0;
}
```

(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 example situations where they can be applied. **(04 marks)**

c) What is the output of the following code?

```
int i, j;

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

(05 marks)

d) Rewrite the following program, correcting all errors.

```
Include <stdio.h>
int main ()
{
  INT p,q,r,s,t;
  Float f,t ;
  printf ( "Enter four integers " )
  scanf("%i, %i, %i, %i", p,q,r,s)
  if (p>q OR r>s)
     t=p, p=q; q=t;
     t=r, r=s, s=t;
printf("p, q, r, s", p, q,r,s)
return 0;
}
```

(06 marks)

4. a) Write a C function that takes an integer as the argument and returns the square of it. Eg: If the argument passed is 4 the returned value should be 16 as $4^2 = 16$. **(05 marks)**

b) What are known as recursive functions? **(02 marks)**

c) What are the two different ways a parameter can be passed to a function in C ? **(03 marks)**

d) What do you mean by a prototype of a function? State the components which should be included in the function prototype. **(04 marks)**

e) Identify the purpose of following functions. Give one example for each.

i. puts()

ii. putchar()

iii. printf() **(06 marks)**

5. a) What is the relationship between arrays and pointers? Explain using an example. **(04 marks)**

b) Declare an array of floats with **two indices**, such that the first index can take values from 0 to 9 and the second can take values from 0 to 12. **(04 marks)**

c) Explain the advantages of using a structure to store a set of data items compared to the use of multiple variables and arrays. **(02 marks)**

d) How do we access the structure members? Provide an example. **(04 marks)**

e) Create a structure containing employee number, name and salary of an employee. Create a *typedef* named *Employee* that can be used to create instances of this structure. **(06 marks)**

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