University of Ruhuna- Faculty of Technology

Bachelor of Engineering Technology (Hons) Degree

Level 1 (Semester 2) Examination, September2020

Course Unit: TMS1223- Computer Programming Techniques Time Allowed: 2 hours

Answer all four (04) questions

This question paper contains **04 pages.**

(1)

a. Name the four (04) control structures used in creating a C program and briefly explain each of them.

b. Write short notes on the following programming languages translators
   i) Assembler
   ii) Compiler
   iii) Interpreter

c. Consider the following C program

//A program to print the age	**Line 1**
#include <stdio.h>	**Line 2**
int main()	**Line 3**
{ const int age;	**Line 4**
age = 25;	**Line 5**
printf ("My Age is %d\n",age);	**Line 6**
return 0;}	**Line 7**

Briefly explain meaning of each line (**Line 1 to Line 7**).

d. Write down the value of **x** after each of the following C statements are executed.

   i) x = 74 / 10 % 2 * 5 – 10 % (5 – 1)

   ii) x = (12-9) /3+3*2-1

e. i) What is are the advantages of using flow chart in computer programming?

   ii) Draw a flow chart to find whether a given number is odd or even?

f. Suppose you obtained a loan from a bank. Write a C program to input principle amount (P), time (T) and interest rate (R) and calculate Compound Interest (CI).

Formula to calculate compound interest (CI) is given below,

$$CI = P \times \left(1 + \frac{R}{100}\right)^{T} - 1$$

Output should be formatted to ***two (02) decimal*** places.

Hint: use pow() function.

(2)

a. Evaluate the following expressions, assuming that x = 2, y = 6.0, and z = 3, specify whether the result is true or false.

i) (x <= 5) || (y > 2) || (z == 6) ii) (x == 1.3) || (y > 5.0) && (z > 2.0)

b. Describe the syntax of the nested ***if*** statement in C programming.

c. Write a nested if statement to print the appropriate activity depending on the value of a variable temperature and humidity as in the table below: Assume that the humidity can only be dry and humid.
Humidity dry='d' humid='h'

if temperature is (C^0)	**if humidity is**	**print this activity**
40	d	"play tennis"
41	h	"swim"
-5	d	"play basketball"
-8	h	"watch TV"
Any other	Any other	" Nothing"

d. i) Explain two (02) differences between a **while loop** and a **do-while loop** in a C program.

ii) What is the output of the following code, if the input is?
5 10 20 -1

```
int sum = 0, number;
scanf("%d", &number);
```

```
while (number != -1)
{
sum = sum + number;
scanf("%d", &number);
}
printf("%d\n", sum);
```

iii) Translate the above **while loop** (d (ii)) into an equivalent ***do-while loop.***

e. Write a C program to generate the following output by using a ***for*** loop.

Output:

1
12
123
1234

(3)

a. Write down three (03) advantages of using functions in a C program.

b. Explain the following terms with examples.

i) Function prototype in C

ii) Argument and Parameter

c. Write a function that will input a *Celsius temperature* and return the corresponding temperature in *Fahrenheit* using the function prototype given below.
Write main program that will prompt the user for the Celsius temperature, invoke the function and print a message containing both the Celsius temperature and the corresponding Fahrenheit temperature.
float CelsiusToFahrenheit(float tempCelsius);

d. i) Write a C program to enter integer elements to an array, assuming size of the array is 10.
Array size =10

ii) Modify the above program to calculate and print the average of elements stored in the array.

(4)

a. Write down two advantages and two disadvantages of using pointer variable in C?

b. Examine the C code given below and write the output produced by **LINE A, LINE B, LINE C and LINE D.**

```
# include<stdio.h>
int main(){
      int x, *p;
      p=&x;
      *p=5;
       printf("x is %d\n",x);     //LINE A
       printf("*p is %d\n",  *p); //LINE B
       *p-=1;
       printf("x is %d\n",x);   //LINE C
        (*p)--;
        printf("x is %d\n",x);  // LINE D
 return 0;}
```

c. Answer the following questions using suitable examples

i) What is a structure in C?

ii) How to create a structure variable?

iii) How to access a structure element?

Write down above part (ii) and (iii) answers with a suitable example

d. Describe following two (02) variables related to command line arguments in C.

i) agrc ii) *argv[ ]

e. Explain four (04) main steps involved in C for file processing.

---------- **End of the Paper**----------