



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 1, Examination in Engineering, May 2022

Module No: EE1101 Module Name: Computer Programming I

[1 hour and 30 minutes]

[Answer all questions. All questions carry equal marks.]

Part II

Q1. a) Consider the following code snippet.

```
int x=0;
while(x) printf(" %d",x);
```

- i. Explain why this code will not display 0 on the console.
ii. Modify the code to display all positive integers below 101 in descending order (that is 100, 99, 98, .., 1).
iii. Modify the code to calculate sum from n=1 to 10 of 1/n. [5 Marks]

b) General form of a for loop is

```
for( Initial ;Condition;Update) { Statement; }
```

- i. Explain the order of execution of expressions and statement.
ii. Add necessary expressions and statements to the following nested loops

```
for( ; ; )
{
  for( ; ; )
  {
    printf("*");
  }
}
```

such that it displays the following output.

iii. Modify the code identified in Q1(b)ii to display the following output

*
**

[5 Marks]

Q2. (a) Format of the **if--else if--else** control statement is given below.

```
if(Condition1)    { Statement1; }
else if(Condition2) { Statement2; }
..
else if(ConditionN) { StatementN; }
else              { StatementL; }
```

Show how to use **if-- else if -- else** to display the Grade for each of the marks stored in the array defined as

```
int myMark[] = {34, 45, 76, 43, 89, 98, 55, 78};
```

based on the marks ranges given in the Table Q2.

Table Q2:

Grade	Marks Range
A	70-100
B	50-69
C	40-49
F	0-39

[5 Marks]

(b) If the array of integers, defined as

```
int num[150];
```

and contains set of integers, write code that would display, minimum, maximum integers of the array, together with corresponding indices of the array. [5 Marks]

Q3. a) State two advantages of using *functions* in a program. [1 Mark]

b) The definition of a function, for testing whether the input character *c* is a digit, is given below.

```
int isdigit (char c)
{ int status = 0;
  if(c <= '9' && c >= '0') status=1;
  return status;
}
```

i. Write the definition of a function to test if the input character is a letter.

- ii. Write the definition of a function that returns the number of letters in the input C-string in the form of an array. The function has the prototype `int nLetters(char str [])`. The `nLetters()` should call the function `isLetter()`. Please note that a C-string ends with the character `'\0'`.

[4 Marks]

- c) Following program, upon completion, is designed to displays the maximum value out of 3 user input integers a, b and c.

```
#include <stdio.h>
```

```
int maxVal(int, int, int);
```

```
int main(void)
```

```
{ int a, b, c, max;
  scanf("%d", &a);
  scanf("%d", &b);
  scanf("%d", &c);
  max=maxVal(a,b,c);
  printf("\nMaximum Value = %d", max);
  return 0;
}
```

```
int maxVal2(int x, int y)
```

```
{
  /*Complete the code*/
}
```

```
int maxVal3(int x, int y, int z)
```

```
{
  /*Complete the code*/
}
```

- i. Complete the code of the function `maxVal2()`.
- ii. Complete the code of the function `maxVal3()` such that `maxVal2()` is called within `maxVal3()`.
- iii. Is it possible to name the variables a, b and c as x, y and z, respectively? Explain your answer.

[5 Marks]

if