



UNIVERSITY OF COLOMBO, SRI LANKA

FACULTY OF TECHNOLOGY

LEVEL I EXAMINATION IN TECHNOLOGY - SEMESTER I - 2020

IC 1302 – Programming I

Three (03) hours

Answer all the questions

Electronic calculators are not allowed.

No. of pages: 05

Important Instructions to Candidates

- If a page or part of this question paper is not printed, please inform the supervisor immediately
- Use the answer booklet provided, to write the answers
- Enter your index number on all pages of the answer script
- Electronic devices capable of storing and retrieving text, including electronic dictionaries and mobile phones are not allowed.
- The question paper consists of four (04) questions. Answer all questions.

Index No:

Question No.	Marks
1	
2	
3	
4	
Total	

1. i) Explain the logic paradigm in programming with a suitable example. (4 marks)
Write two programming languages which uses the logic paradigm.

ii) Consider the C code segment below which is written by a retail shop to generate the total payable amount of a bill payment. The retail shop has decided to award a 5% discount when the customer has purchased goods for Rs. 2500. Fill the missing parts of the code at (a) and (b). Hint: (a) should include an expression to check the eligibility to award the discount and (b) should denote the expression to get the total payable price for the bill by the customer. (5 marks)

```
#include<stdio.h>
int main(){
    float billed_amount = 2500.00;
    float discount;
    float x = ..... (a) ..... ;
    printf ("Total Payable %.2f", ..... (b)..... );
    return 0;
}
```

iii) Why does a user need to cast a variable at certain instances in C? (6 marks)
Explain with a suitable example.

iv) Describe the code below. What is the expected output? (7 marks)

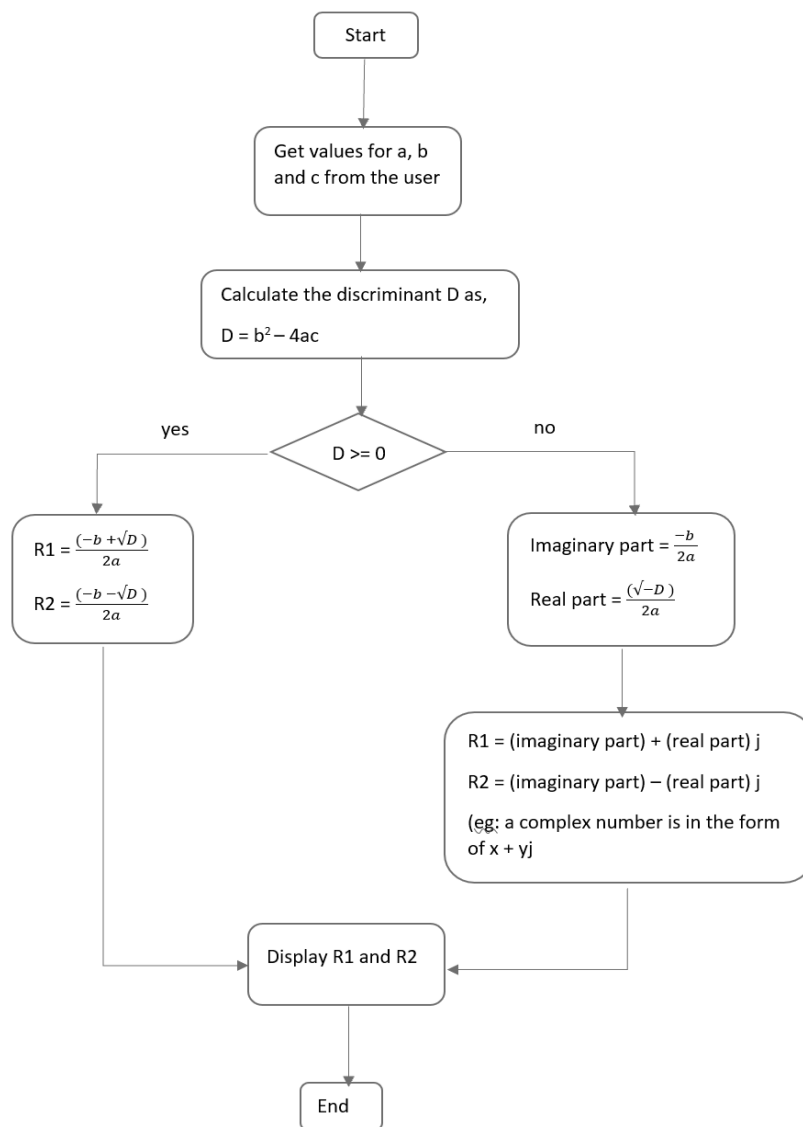
```
#include <stdio.h>
int a = 20;
int b = 50;

int main () {
    int c = func(a, func(a,b));
    printf ("Value of C = %d", c);
    return 0;
}

int func(int, int) {
    a = 5;
    b = a;
    a += b;
    return a;
}
```

v) Write the outcome of the expression $!7 | 6 \gg 2$ with the appropriate steps followed to obtain the answer. (3 marks)

2. i) What is the difference between function definition and function declaration? Are both required to compile and run a C program? Justify your answer. (5 marks)
- ii) Explain the term “passing parameters by value” to a function. (3 marks)
- iii) A student needs to find the roots of a given quadratic equation ($ax^2 + bx + c = 0$) using a C program. You are expected to write the entire code needed to successfully compile and obtain results. The following flow chart may be used as a hint to solve the problem. (10 marks)



- iv) Write a C function to identify whether a given set of five (05) integer numbers are even or odd. The function should display each number and whether it's odd or even. Assume that the function has only one argument. The numbers are passed as a single function parameter. (5 marks)
- v) What is the output of the C code segment below? Justify your answer. (2 marks)

```
#include<stdio.h>
enum colors
{
    red, blue, green;
};
void main()
{
    enum colors c = green;
    printf ("%d",c);
}
```

3. i) Write two advantages of using pointers in a C programme. (2 marks)
- ii) Explain what is “pointer to a pointer”. Using a suitable diagram describe how you could get the value of a variable that is pointed by a pointer. (5 marks)
- iii)

float:	4 bytes
double:	8 bytes
short:	2 bytes
int:	4 bytes
long:	4 bytes

 A C compiler in a x86 machine, allocates memory to the following data type as follows. (6 marks)

If there is a union defined as below what is the total memory that will be allocated for the union? Justify your answer.

Write a C statement to display the memory that will be allocated for the union.

```

struct point {
float x;
float y;
};

union circle {
struct point center;
float radius;
};

```

- iv) What is the advantage of using type definitions with respect to data types in C? (3 marks)
- v) Write is the use of a C Preprocessor? (3 marks)
- vi) Write a macro to identify whether a given number is divisible by three or five. Display 1 if the number is divisible and display 0 if it is indivisible. (6 marks)
4. i) Explain what is meant by a dangling pointer. (3 marks)
- ii) Describe the need of using realloc() in C memory management. (3 marks)
- iii) What is the difference between fgetc() and fgets()? (3 marks)
- iv) Eliminating fclose() in a program written to handle file operations will result in compilation errors. Do you agree or disagree? Justify your answer. (4 marks)
- v) Consider a one-dimensional array of ten elements. (6 marks)
- a) Write a C program to find the number of elements with duplicate values.
- b) Write a C program to find the largest value of the array. (6 marks)

***** End of Examination Paper *****