INTERNATIONAL CENTRE FOR APPLIED SCIENCES
MAHE, MANIPAL

B.Sc. (Applied Sciences) in Engg.

End – Semester Theory Examinations – MAY 2021- Repeaters 2018 Batch

I SEMESTER – PROBLEM SOLVING USING COMPUTERS (ICS 111)

(Branch: Common to all)

Time: 3 Hours **Date: 29 May 2021** **Max. Marks: 100**

- ✓ **Answer any FIVE full questions.**
- ✓ **Missing data, if any, may be suitably assumed.**
- ✓ **Draw neat sketches wherever necessary.**

1A. Differentiate between

i) Machine level language and High level language.

ii) Compiler and Interpreter.

1B. Draw the flowchart to find sum of the digits of a given number. **(10 + 10)**

2A. Write an algorithm to find all kinds of roots of a quadratic equation.

2B. Write short notes on:

i) Scope of a variable.

ii) Pointer. **(10 +10)**

3A. Evaluate the code/expression :

i) (2.5/3) %2

ii)
```
int I,j,k;
I=j=k=5;
cout<<I;
```

iii)
```
int x,y,z,a;
x=1;
y=2;
z=3
a= x--  +  - -y  + z++;
cout<<a<<x<<y<<z;
```

iv)
```
int a=7;
int b=15;
cout<< ( a & b );
```

v)
```
int a=5;
if(  a =  -5)
cout<<a;
else
cout<< - a;
```

3B. Illustrate Binary search to find element 157 in the array of elements { 10, 30, 40, 90, 100, 150, 155, 200} . Demonstrate all the steps clearly. **(10 + 10)**

4A. Differentiate between exit controlled and entry controlled loop with the help of flowchart and example code snippet.

4B. Write a complete C++ program to insert an element as a first element to an already populated array. Sort the resultant array and display the sorted array. **(10 + 10)**

5A. Write a complete C++ program to multiply two 2D matrices. Program should have code to check for multiplication rule.

5B. Write a complete C++ program to find the number of occurrence of a given substring in the main string. **(10 + 10)**

6A. Define the Employee structure with name, employee-code and salary as it's data members. Declare an array to hold n Employees records. Display the array in the sorted order on the basis of employee-code. Write Complete C++ program to demonstrate the same.

6B. Write complete C++ program to explain default argument function. What is the utility of the default argument? **(12 + 8)**

7A. Describe any two category of functions with the help of syntax (prototype) and example code.

7B. Define a function IsPrime ( ) which returns true if the number is prime or else it returns false. Use this function to find number of primes in an array, in main ( ) function. Use enum to get integer equivalent of true end false. **(6+14)**

8A. What is inheritance? What are the different types of inheritance defined in C++?

8B. Create a class Complex with data members: imaginary, real and member functions: read( ) , display( ) and add( ). Function read( ) , reads a Complex number. Function display( ) prints the complex number in the a+ ib format. Function add( ) finds sum of two Complex number and returns result to main( ). Demonstrate the functionality of these functions through main( ) **(10 +10)**

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