Department of Mechanical and Industrial Engineering
Indian Institute of Technology Roorkee

MIN-103: Programming and Data Structures
End Term Examination – Part B

Instructions:

- Write answers for Q1 and Q3 on paper. Scan them and upload as a single pdf.
- For Q2, write the complete code as a single .cpp file and upload it.
- Please name your pdf and word using your enrolment number. For example if you enrolment number is 16117016, save your files as 16117016. No deviation in this will be entertained.
- Link for upload: https://forms.gle/NhvA6pvYZHQdVwg46

1. (a) Enter appropriate values as asked in the following code, and write the output of the following code. — 6 marks
   (b) Using a single sentence explain what does Func1 and Func2 do? — 4 marks

```
#include<iostream>
using namespace std;

void Func1(int a, int b){
    double temp = a; a = b; b = temp; }

void Func1(double &a, double &b){
    double temp = a; a = b; b = temp; }

double Func2(int a){
    double b=0,i;
    while(a>0){
        b+=(a%10);  a/=10; }
    return b;  }

int main(){
    int dof, i=10;
    cout<<"Enter your date of birth in ddmmyy format: ";
    cin>>dof;
    double x=dof, f=10.5;
    Func1(dof, i);
    cout<<endl<<dof;
    Func1(x, f);
    cout<<endl<<x;
    cout<<endl<<Func2(dof); }
```

2. Write a C++ code for the following: — 4+4+4 = 12 marks
   (a) Create a structure student that is composed of the student's name, roll number, and students' marks obtained in 5 subjects. Make a member function to take user input of all data of a student (Hint: It inputs all members of the student structure), and a member function to display the student data along with student's average marks.
   (b) In the main () program, ask the user to enter the data of 5 students in a class. Then, the program should display the average marks of the class in each subject.

(c) After this, the program should prompt the user to enter a student's roll number. If that roll number does not exist in the entered database then print "Entry not found", otherwise, print the report card of that roll number.

3. The following code consists of a function arrayProcess() that accepts two arguments that are: a pointer to an integer and an integer. This function **uses the pointer** to do the following: 3+3+3+3= 12 marks

   i. Display values stored in the1-D array.
   ii. Display the beginning address of the 1-D array (address of 1st element)
   iii. Display the ending address of the 1-D array (address of last element)
   iv. Creates another 1-D array dynamically and assigns the pointer to this array.

Complete the function body.

```
#include<iostream>
using namespace std;
void arrayProcess(int* A, int N)
{----}

int main()
{
      int a[5];
      cout<<"Enter elements of and array"<<endl;
      for(int i=0; i<5; i++)
      cin>>a[i];
      arrayProcess(a,5);
}
```