WEST BENGAL UNIVERSITY OF TECHNOLOGY

MCA-205

OBJECT-ORIENTED PROGRAMMING WITH C++

Time Allotted: 3 Hours | Full Marks: 70

The questions are of equal value.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable. All symbols are of usual significance.

GROUP A
(Multiple Choice Type Questions)

1. Answer any *ten* questions. $10 \times 1 = 10$

(i) What will be the output for the following:

```
# include<iostream.h>
int main(){
int x = (10, 013);
cout<<" x = "<<x
return 0;
}
```

(A) x = 10 (B) x = 13
(C) x = 12 (D) x = 11

(ii) int * ptr = 0x45671233; The statement causes compilation error. To rectify it

(A) Use and before 0x45671233

(B) Remove the 0x

(C) Use (int *) before 0x45671233

(D) None of the above works correctly

(iii) What will be the output for the following:

```
# include<iostream.h>
int val = 30;
int and f() {return val;}
int main () {
        cout<<" Val = "<<val<<;
        f() = 40;
          cout<<" val = "<<val<<"\n";
        return 0;
}
```

(A) Val = 30 Val = 30 (B) Val = 30 Val = 40

(C) Compilation error (D) It throws Exception

(iv) When the compiler uses the template to generate a function definition for a particular type, the result is termed as _____ of template

(A) Specialization (B) Generalization

(C) Instantiation (D) None of the above

(v) What happens when a class with parameterized constructors and having no default constructor is used in a program and we create an object that needs a zero-argument constructor?

(A) Compile-time error (B) Preprocessing error

(C) Runtime error (D) Runtime exception

(vi) When are the Global objects destroyed

(A) when the control comes out of the block in which they are being used

(B) when the program terminates

(C) when the control comes out of the function in which they are being used

(D) as soon as local objects die

(vii) Which of the following statements is correct?

(A) destructors have a default value

(B) destructors can take arguments

(C) destructors deallocate memory allocated for the objects

(D) nne of these

(viii) If you define the constructor in the private section and try to create the object of that class. Options are:

(A) it gives the syntax error

(B) it gives the run time error

(C) needs to define a proper static functions

(D) none of the above

(ix) Suppose you perform the following operations: (Assume that String class has a pointer member to hold the string information)

String metto = String(also);

Which option is appropriate

(A) it works properly

(B) to get perfect result you need copy constructor

(C) to get perfect result you need overload assignment operator

(D) it works but throws Null Pointer assignment message. To overcome it you need copy constructor.

(x) What will be the output:

```
#include<iostream.h>
int main() {
  int x = 10;
  int y = 20;
  if ( ((x++)>10) & & (++y))
        cout<<"x = "<<x<<" y = "<<y<<" then"<<"\n";
else
        cout<<"x = "<<x<<" y = "<<y<<" else"<<"n\";
return 0;
}
```

(A) x = 10 y = 20 then (B) x = 11 y = 20 then

(C) x = 11 y = 20 else (D) x = 10 y = 21else

(xi) The argument of a copy constructor is passed by

(A) Value (B) Reference

(C) Pointer (D) Both (A) and (C)

(xii) In binary operator overloading how many arguments does a friend function take?

(A) one (B) two

(C) three (D) four

GROUP B
(Short Answer Type Questions)

Answer any *three* questions. 3×5 = 15

2. (a) What is inline function? Illustrate with an example. (2+1)+2
   (b) What are the limitations of inline function?

3. What is the difference between the function overloading and function overriding? Illustrate with an example. 5

4. What is the purpose of the Constructor? Why destructor cannot be overloaded? 2+3

5. What is the difference between static and dynamic binding? Illustrate with an example. 5

6. Should one constructor call another constructor as a primitive? Explain what is abstract class? 3+2

GROUP C
(Long Answer Type Questions)

Answer any *three* questions. 3×15 = 45

7. Create a class student. Student class has the following attributes: Name (character type pointer), roll, marks and year (character type pointer). 4+4+4+3
   (a) Initialize the attributes using the constructor (use the constructor overloading)
   (b) Create the five student records and print the student name and roll number who scored highest.
   (c) For correct execution you should overload the assignment operator.

8. (a) How to overload prefix and postfix operator? 5+5+(2+3)
   (b) What is friend function? Illustrate the concept of friend function with an example.
   (c) What is copy constructor? When a copy constructor should be defined? Illustrate with an example.

9. (a) Write a program that creates a base class called the Number. This class holds an integer value and contain a virtual function called displayNum(). Create two derived classes called HexNum and OctalNum that inherits Number. Override displayNum() in the derived classes so that it 10+3+2

displays the value in Hexadecimal and Octal, respectively. Write a main function to create object of HexNum and OctalNum classes and display the hexadecimal and octal form of the supplied integer value. Use the base class pointer to call a function.

(b) What is virtual class? Explain if friend functions can be virtual or not.

10.(a) What are syntax and semantics for a class template? 4+4+7

(b) How a local object is destructed before the end of its function?

(c) Consider the following file named file2.txt

It gets the job done quickly
It is instantaneous
It prevents loss, by meeting deadline
In the short run the person's performance may improve.

Write a program that counts the number of occurrences of the pattern "It" in the file2.txt.

11. Write short notes on any *three* of the following: 3×5

(a) Encapsulation
(b) Manipulators of C++
(c) Container class
(d) Virtual Method table
(e) Stream.