B2.51-R3: INTRODUCTION TO OBJECT ORIENTED PROGRAMMING AND C++

NOTE:

1. There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.

2. **PART ONE** is to be answered in the **TEAR-OFF ANSWER SHEET** only, attached to the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book.

3. Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the answer sheet for **PART ONE** is returned. However, candidates, who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the answer sheet for **PART ONE**.

TOTAL TIME: 3 HOURS **TOTAL MARKS: 100**

(PART ONE – 40; PART TWO – 60)

PART ONE
(Answer all the questions)

1. Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "tear-off" answer sheet attached to the question paper, following instructions therein. (1 x 10)

1.1 The range of values for the long data type on a 16-bit machine is

A) -2^{31} to $2^{31}-1$
B) -2^{64} to 2^{64}
C) -2^{63} to $2^{63}-1$
D) -2^{16} to $2^{16}-1$

1.2 For representing polynomial in memory, using linked list, each node must have following number of fields

A) 2
B) 3
C) 1
D) None of the above

1.3 Inheritance is a way to

A) Create general classes from more specific classes
B) Create specific classes from more general classes
C) Improve data hiding and encapsulation
D) None of the above

1.4 Consider the following code:

```
if(number>0)
cout<<"Number is Positive";
else
cout<<"Number is Negative";
```

What will be the output if number is equal to zero?

A) Number is Positive
B) Number is Negative
C) Both A) & B)

D) None of the above

1.5 Which of the following can't be passed to a function

A) Reference variable
B) Array
C) Class objects
D) Header files

1.6 Which of the following is legal declaration of a reference?

A) int &a=10;
B) int &a=m;
C) int *a=&15;
D) int &a=m++;

1.7 If p and q are two pointers of type int and m is an int type variable, which of the following is legal?

A) p-q
B) p*q
C) p/q
D) m%n

1.8 Consider the following code definition:

```
class Person
        {
        };
        class Student: protected Person
        {
        };
```

What happens when we try to compile this class?

A) Will not compile class body of Person is not defined
B) Will not compile because of Student is not defined
C) Will compile successfully
D) Will not compile because class Person is not public inherited.

1.9 We can make a class abstract by

A) Declaring it abstract using the static keyword
B) Declaring it abstract using the virtual keyword
C) Making all member functions constant
D) Making at least one member function as pure virtual function

1.10 An exception is caused by

A) A hardware problem
B) A problem in the operating system
C) A run-time error
D) A syntax error

2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the "tear-off" sheet attached to the question paper, following instructions therein. (1 x 10)

2.1 A 'Do' loop is executed at least once.
2.2 Objects of the string class can be copied with the assignment operator.
2.3 Inheritance is used to improve data hiding and encapsulation.
2.4 An abstract class is never used as a base class.
2.5 A file pointer always contains the address of the file.
2.6 Template creates different versions of a function at run time.
2.7 Throwing an exception always causes program termination.
2.8 Derived classes of an abstract class that do not provide an implementation of a pure virtual function are also abstract.
2.9 A function template can have more than one template argument.
2.10 The function that has return type void does not return anything.

3. Match words and phrases in column X with the closest related meaning/ word(s)/phrase(s) in column Y. Enter your selection in the "tear-off" answer sheet attached to the question paper, following instructions therein. (1 x 10)

X		Y	
3.1	Reusability	**A.**	Can appear in the class desiring access to another class
3.2	Abstract data type	**B.**	is a well-defined and complete data abstraction that uses the principle of information hiding.
3.3	Function	**C.**	Is used to delete the memory allocated by new.
3.4	Token	**D.**	Makes a program run faster
3.5	Encapsulation	**E.**	It means one name having multiple forms.
3.6	Friend	**F.**	A class can contain objects of other classes
3.7	Static_ cast	**G.**	It may be over loaded.
3.8	Delete	**H.**	This operator is used for any standard conversion of data type.
3.9	Local variable	**I.**	It is the smallest individual units in a program
3.10	Polymorphism	**J.**	The wrapping up of data and functions into a single unit
		K.	Is a variable defined within a statement block
		L.	Is provided by the concept of Inheritance

4. Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Enter your choice in the "tear-off" answer sheet attached to the question paper, following instructions therein. (1 x 10)

A.	class name	**B.**	object	**C.**	new
D.	brackets	**E.**	comment	**F.**	zero
G.	iostream	**H.**	inheritance	**I.**	multilevel
J.	static	**K.**	public	**L.**	virtual
M.	protected	**N.**	istream	**O.**	catch

4.1 _____ is used to document a program.

4.2 A constructor's name is same as _____.

4.3 A(n) _____ function causes its class to be abstract.

4.4 A pointer to _____ can hold pointers to any data type.

4.5 _____ are used to change the order of precedence in evaluation of expression.

4.6 The process by which objects of one class acquire the attributes of objects of another class is known as _____.

4.7 The class _____ declares input function such as get( ) and read( ).

4.8 The_____ operator dynamically allocates memory for the object of a specific type.

4.9 A virtual function can be made pure virtual function by placing_____ at the end of its prototype in the class definition.

4.10 Exceptions are thrown from a try statement to a(n) _____ block.

PART TWO

(Answer any **FOUR** questions)

5.

a) Differentiate between declaration and definition in C++.

b) Explain the concept of exception handling.

c) Write a class employee with two function get data and put data to read the name and number of employee and display them respectively. Drive two classes one manager and other scientist. In manager class add one more variable title. In scientist class add more variable publication and display them.

(2+3+10)

6.

a) How can a '::' operator be used as unary operator?

b) What are the merits and demerits of friend function?

c) Why does the function arguments are called as "signatures"? Give example.

d) How do structures in 'C' and 'C++' differ? How does a 'C++' structure differ from a class?

(3+4+4+4)

7.

a) Differentiate between early binding and late binding.

b) Write 'C++' class for the following:
To represent two-dimensional point (x, y), class should contain all different constructors and methods to print point (x, y) format and also to add two points by adding their x and y values.

c) Write a 'C++' program for scalar multiplication where each item in array of N values is multiplied by a given constant. Write necessary class and test it using main( ).

(5+5+5)

8.

a) Write a program to concatenate two strings using operator overloading.

b) Write a function using reference variable as arguments to swap the values of a pair of integers.

c) Write short note on: static variables and static functions.

(5+5+5)

9.

a) What is a class template? List the merits and demerits of using a template in 'C++'.

b) When is it necessary to use member-wise initialization list (also known as header initialization list) in 'C++'?

c) Explain stream classes, stream class hierarchy and stream manipulators.

d) Justify the use of constructors and destructors in C++.

(4+4+3+4)