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 Consider the following statements:

```
int x = 22, y = 15;
x = (x<y) ? (x+y) : (x-y);
```

What will be the value of x after executing these statements?

A) 22
B) 37
C) 7
D) Error. Cannot be executed.

1.2 Which of the following will produce a value of 9 if x=8.7?

A) floor(x)
B) abs(x)
C) log(x)
D) ceil(x)

1.3 What would be the output of the following program?

```
int main( )
      {
      int x, y=10,z=10;
      x=(y==z);
      cout<<x;
      return 0;  }
```

A) 0
B) 1
C) 10
D) error

1.4 When the break statement is encountered inside a loop, which one of the following occurs?

A) control goes to the end of the program
B) control leaves the function that contains the loop
C) causes an exit from the innermost loop containing it
D) causes an exit from all the nested loop

1.5 The friend functions are used in situations where

A) we want to have access to unrelated classes
B) dynamic binding is required
C) we want to exchange data between classes
D) none of the above

1.6 A relational operator

A) assigns one operand to another
B) yields a Boolean result
C) logically combines two operands
D) None of the above

1.7 The library function exit() causes an exit from

A) the loop in which it occurs
B) the block in which it occurs
C) the function in which it occurs
D) the program in which it occurs

1.8 Which of the following is good reason to use an object-oriented language?

A) It's easier to conceptualize an object-oriented program
B) program statements are simpler than in procedural languages
C) An object-oriented program can be taught to correct its own error
D) None of the above

1.9 What is the error in the following code?

```
class Test
      {
       virtual void draw( );
      };
```

A) No error
B) Function draw( ) should be declared as static
C) Function draw( ) should be defined
D) Test class should contain data members

1.10 A template class

A) is designed to be stored in different containers
B) works with different data types
C) generate objects which must all be identical
D) generates classes with different numbers of member functions

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 The pre-increment and post-increment ++ operator can be overloaded.
2.2 It is illegal to make objects of one class as members of another class.
2.3 Only when an argument has been initialized to zero value, it is called the default argument.
2.4 When calling a function, if the arguments are passed by reference, the function works with the actual variables in the calling program.
2.5 The precedence of an operator can be changed by overloading it.
2.6 A pointer to a base class can point to an object of a derived class of that base class.
2.7 A derived class is often called a subclass because it represents a subset of its base class.
2.8 Can we make a class as a friend?
2.9 The expression for (;;) is the same as a while loop with a test expression of true.
2.10 A const member function prevents modification of any of its class's member data.

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	The ability to change the definition of an inherited method or attribute in a subclass.	**A.**	<<
3.2	Rules that governs the construction of statement.	**B.**	late binding
3.3	A data type that holds the address of a location in memory.	**C.**	syntax
3.4	A short piece of text, or text template that can be expanded into a longer text.	**D.**	overriding
3.5	The operator stops reading a string when a space is encounter.	**E.**	pointer
3.6	To convert a variable from one type to another type by explicitly.	**F.**	>>
3.7	The visible methods of an object.	**G.**	stream
3.8	A source from which input data can be obtained or a destination to which output data can be sent.	**H.**	parameter
3.9	A function that although not a member of a class is able to access the private members of that class.	**I.**	friend
3.10	The addresses of the functions are determined at run time.	**J.**	Macro
		K.	cast
		L.	interface

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.	descructor	**B.**	ios	**C.**	polymorphism
D.	ctype.h	**E.**	return	**F.**	class library
G.	abstraction	**H.**	multiple inheritance	**I.**	constructor
J.	overloading	**K.**	multilevel inheritance	**L.**	conio.h

4.1 A(n) _____ statement supplies a value from the called function to the calling function.

4.2 _____ allows a derived class to have more than one base class.

4.3 toupper( ) is defined in _____.

4.4 _____ is the process of highlighting the essential, inherent aspects of an entity while ignoring irrelevant details.

4.5 A group of related classes, supplied as a separate product, is often called a(n) _____.

4.6 A(n) _____ is called to deallocate memory of the objects of a class.

4.7 The ability of a function or operator to act in different ways on different data types is called _____.

4.8 The base class for most stream classes is the _____ class.

4.9 getch( ) is defined in _____.

4.10 A language feature that allows a function or operator to be given more than one definition is called _____.

PART TWO

(Answer any **FOUR** questions)

5.

a) What is the difference between an object-based language and an object-oriented language?

b) What do you mean by abstraction? Is it necessary to create good abstraction?

c) Why did people change over from structured programming to object-oriented programming?

d) Explain the advantages of pointers over references.

e) Why do we need to use constructors?

(3x5)

6.

a) Why member functions are not virtual by default?

b) Write a program in C++ that contains a class derived from base. The base class should have a virtual function fun( ) and it should be overridden. Try to call fun( ) from the constructor of the base class and display the result.

c) Implement a class sample with an overloaded + operator. Explain the following statements:

```
s2=s1+10;
s2=10+s1;
```

where s1 and s2 are objects of class sample.

(3+6+6)

7.

a) Explain the concept of operator overloading. Illustrate operator overloading concept to concatenate strings.

b) How is polymorphism achieved at run time? Explain with C++ coding.

(8+7)

8.

a) Distinguish between overloaded functions and function templates.

b) Imagine a publishing company that markets both book and audiocassette version to its works. Create a class publication that stores the title (a string) and price (type float) of a publication. From this class derive two classes: book, which adds a page count (type int); and tape, which adds a playing time in minutes (type float). Each of these three classes should have a getdata( ) function to gets its data from the user at the keyboard, and a putdata( ) function to display its data.

Write a main( ) program in C++ to test the book and tape classes by creating instances of them, asking the user to fill in data with getdata( ), and than displaying the data with putdata( ).

(5+10)

9. Write short notes on **any three**:

a) Stream classes

b) Friend function

c) Exception handling

d) Multiple inheritance

(3x5)