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 In C++ the index of an array starts with
A) Any negative value.
B) Any positive value.
C) Value 1.
D) Value 0.

1.2 #include is a
A) Compiler statement
B) Debugging statement
C) Pre-processor statement
D) None of the above

1.3 Inline function acts as a
A) Function
B) Macro
C) Operator
D) Manipulator

1.4 Free store operators is (are)
A) :: (double colon)
B) & (ampersand)
C) * (star)
D) new, delete

1.5 ios represents
A) A class member function
B) A constant object
C) A stream
D) A base class

1.6 A global variable declaration is made
A) Only in main function
B) Only in functions other than main function
C) Only outside functions
D) None of the above

1.7 A class can have
A) Only one constructor
B) Any number of constructors
C) Same number of constructors as the number of data members
D) None of the above

1.8 A function with variable number of arguments
A) Have only one prototype declaration
B) Should have as many as prototype declaration to be used to actual functions used with different parameters
C) No prototype of the function required
D) None of the above

1.9 The break statement is used
A) To exit from the function in which it is used
B) To exit from the program
C) To exit from the loop in which it is used
D) To exit from all the nested loops

1.10 In overloading an operator we can use
A) To create a new operator
B) To overload the conditional operator, a ternary operator
C) Only to overload unary operator
D) To overload the unary as well as binary operator

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 Structures in C++ cannot have member functions.
2.2 Objects cannot be declared as part of a union element.
2.3 Friend functions cannot be used to overload operators.
2.4 A constructor can be used to convert a basic type to a class type data.
2.5 Casting operator function and constructor function have the same syntax.
2.6 Pure virtual functions force the programmer to redefine the virtual function.
2.7 A pointer to a base class cannot be made to point to objects of derived class.
2.8 A stream may be connected to more than one file at a time.
2.9 Binary files store floating-point values more accurately and compactly than the text files.
2.10 An exception handling mechanism is used to detecting syntax errors in the program.

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	All members share the same memory	**A.**	function template
3.2	Enclose a code raising an exception	**B.**	public
3.3	To construct a family of functions, what we use?	**C.**	volatile
3.4	To enhance an existing data types, a statement is used	**D.**	enum
3.5	To determine the number of bytes used by the variable	**E.**	constructor
3.6	Members accessible to all users	**F.**	virtual
3.7	Every reference to the variable will reload the contents from memory, rather than can take advantage of situations where a register is allocated to the variable for efficiency purpose.	**G.**	seekg( )
3.8	Which type of class allows to inherit only one copy of a base class indirectly from more than one immediate base classes	**H.**	try
3.9	Declares a set of constants of type int	**I.**	seekp( )
3.10	We use the function to position the pointer in the input file to read from a specified location	**J.**	size of
		K.	union
		L.	typedef

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.	static	**B.**	run time	**C.**	friend
D.	pointers	**E.**	void	**F.**	int
G.	compile time	**H.**	size of	**I.**	heap
J.	public	**K.**	register	**L.**	virtual

4.1 The dynamic memory is allocated by the operator new from the _____ area.

4.2 An integer variable is declared as _____ to speed up data access.

4.3 _____ pointers cannot be dereferenced without explicit type casting.

4.4 _____ function allows derived classes to provide different versions of a base class function.

4.5 If the value of a local variable is to be preserved between successive calls to that function, it is to be declared as _____.

4.6 Generic-data type is known at _____.

4.7 _____ function is allowed to access the private and protected members of a class using class objects.

4.8 _____ is used to find the number of bytes taken for the user define object.

4.9 Strings are always handled through _____.

4.10 A function that has return type _____ does not return anything.

PART TWO

(Answer any **FOUR** questions)

5.

a) What are the differences between pointers to constants and constant pointers? Give examples.

b) What is runtime memory management? What support is provided by C++ for this and how does it differ from C's memory management?

(7+8)

6.

a) What is containership or delegation? How does it differ from inheritance? Explain with suitable example.

b) What are the different forms of inheritance supported by C++? Explain by writing statements of each type.

(10+5)

7. Write a C++ program **disp** to display the contents of a random file beginning with the location you specify on the command line.

```
disp  fixt.txt   15
```

(15)

8.

a) Explain the concept of operator overloading? Illustrate with suitable examples? What are the operators that cannot be overloaded?

b) What is a copy constructor? What are the advantages of a copy constructor? Give examples?

c) Write down all the rules with respect to virtual functions.

(5+5+5)

9.

a) Write a program to demonstrate the catching of all exceptions. What happens when a raised exception is not caught by catch-block (in the absence of catching all exceptions block)?

b) What is a class template? Write a template-based complete program for adding two objects of the **vector** class. Use dynamic data members instead of arrays for storing vector elements.

(8+7)