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. (1x10)

1.1 Which of the object-oriented programming pillars is not supported by C++?
A) Capitalization
B) Encapsulation
C) Polymorphism
D) Inheritance

1.2 Which of the following is a characteristic of a class?
A) A class can have only one object
B) A class is a template to create objects
C) A class contains only data
D) A class contains only methods.

1.3 Consider the declaration: `char arr [15];` What does arr point to?
A) Starting address of the array
B) Size of the array
C) Ending address of the array
D) Number of elements in the array

1.4 When a subclass inherits from a class which itself has inherited from another class, it is known as:
A) Multilevel inheritance
B) Single inheritance
C) Multiple inheritance
D) Hierarchical Inheritance

1.5 Memory during runtime can be obtained by
A) Static allocation
B) Heap
C) Stack manipulation
D) Dynamic memory allocation

1.6 The process of using the same name for two or more functions is called
A) Function overriding
B) Function overloading
C) Operator overloading
D) Overridden functions

1.7 A function that is granted access to private and protected members of a class is called
A) A Member function
B) An Inline function
C) A Friend function
D) A Non-member function

1.8 In C++, what is a pointer?
A) A variable that points to memory-resident programs
B) A variable that stores the memory address
C) An indication for the variable to be accessed next
D) The datatype of an address variable

1.9 Which of the given statements is true about the expression `int (*f) ( );`?
A) f is a function which returns pointer to integer
B) The expression is syntactically incorrect
C) f is a pointer to a function which returns an integer
D) f is a function of pointers that returns an integer

1.10 A default constructor takes
A) One parameter
B) Two parameters
C) Three parameters
D) No parameters

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. (1x10)

2.1 Member function that operates on the data is called an object.
2.2 Lowercase and uppercase alphabets are mixed in variable names.
2.3 Input/output objects of C++ recognize *enum* data types.
2.4 Predefined variables can be used in function calls as arguments.
2.5 Objects can be furnished as function arguments.
2.6 It is possible to overload '+' operator so that it can be used in string operations such as x3=x1+x2, to perform concatenation.
2.7 Inheritance is identical to overloading.
2.8 It is always necessary to delete a pointer, set up by the *new* operator.
2.9 **`cout`** is called a predefined object of **`ostream`** class.
2.10 A constructor's name is the same as class name.

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. (1x10)

X		Y	
3.1	Member Function	**A.**	is returned by a variable referenced as & variable
3.2	Data Hiding	**B.**	can never have a body
3.3	long double	**C.**	is the operator which helps to invoke a member function of a base class in a derived class
3.4	dot operator	**D.**	function that operates on objects
3.5	Copy constructor	**E.**	types of floating point variable
3.6	Exception handling	**F.**	one of the most important features of C++
3.7	Pure virtual function	**G.**	class member access operator
3.8	Derived class	**H.**	in which inheritance is used
3.9	an Address	**I.**	returns by value
3.10	fstream.h	**J.**	mechanism to handle errors
		K.	header file in which all disk file I/O operations are included
		L.	invoked when function returns by value

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. (1x10)

A.	Unsigned int	**B.**	cout	**C.**	cin
D.	new	**E.**	Operator Overloading	**F.**	constructor
G.	Structure	**H.**	Abstract class	**I.**	base
J.	Declaration	**K.**	Continue	**L.**	derived
M.	this	**N.**	Objects	**O.**	Current position

4.1 _____ pointer returns by reference.

4.2 A _____ can be used to convert a basic type to a class type data.

4.3 _____ operator enables dynamic memory allocation.

4.4 Level of inheritance means deriving a class out of _____ class.

4.5 _____ is the prototype of the function.

4.6 _____ could be replaced by a *goto* with a statement label where the label is associated with the first statement in the loop.

4.7 _____ is one that is not used to create objects.

4.8 _____ object belongs to a standard input stream.

4.9 _____ is called compile time polymorphism.

4.10 Array of _____ and array of structure are similar.

PART TWO

(Answer any **FOUR** questions**)**

5.

a) Explain how object-oriented programming is better than other programming techniques?

b) Explain in brief about Data Abstraction and Encapsulation.

c) Create a class measure having data members: feet and inch. Another class distance having data members Meter. Define a function such that it adds two different objects of both the classes and display equivalent distance in Centimeter. Define main ( ) to test the class.

(5+5+5)

6.

a) Create a class STR having character array, 'string', as data member. Define a constructor and two member functions for the class to input and display the character array, respectively.

b) What is function overloading? Explain it in detail giving suitable examples.

c) What is an exception? What are the types of exception? Explain the exception handling mechanism.

(5+5+5)

7.

a) What is Inheritance? Explain the types of inheritance using diagram.

b) In which conditions it is compulsory to use friend function? What are the characteristics of a friend function?

c) What is a pointer? How it can be used with objects of a class? Explain this pointer.

(5+5+5)

8.

a) Create a class Clock having private data members hour and minute in integer. A default constructor should initialize the data to 0. Overload it with parameterized constructor. A member function should enter the data and another should display time in 10:37 format. A final member function should receive two objects, add them and store the result to the invoking object. Write an appropriate main ( ) function.

b) Explain the concept of virtual base class for inheritance.

c) Differentiate between early binding and late binding.

(7+5+3)

9.

a) Explain **`inline`** function concept in detail.

b) What are the advantages of templates in generic programming?

c) Write short note on stream classes for console I/O operation in C++.

(6+4+5)