

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 How would you interpret a statement like `*a += 40;`

- A) Contents of a location `a` incremented by 40 and stored in `a`
- B) Address of a location `a` incremented by 40 and stored in `a`
- C) Address and contents of a location `a` incremented by 40 and stored in `a`
- D) Contents of a location `a` is stored in `a` and incremented by 40

1.2 The function's most important role is to

- A) Give a name to a block
- B) Reduce program size
- C) Accept arguments and provide a return value
- D) Organize a program into conceptual units.

1.3 The keyword `friend` can appear in

- A) The class allowing access to another classes
- B) The class desiring access to another classes
- C) It does not matter where you put the keyword
- D) The scope of the class

1.4 What is achieved by the following declaration in class structure:

- ```
void operator ++ () {C++ ;}
```
- A) `++` overloaded
  - B) pre increment
  - C) post increment
  - D) All of the above

1.5 A function in a class declared as private is accessible to-

- A) Member function of its derived class of that class
- B) Member function of all classes
- C) Member function of that class

D) None of the above

1.6 Which of the following are not keywords?

- A) Null
- B) protected
- C) abstract
- D) string

1.7 Which of the following would be an invalid class declaration?

- A) Class d: public b2, public b1
- B) Class d: class b2, class b1
- C) Class d: public b2, b1
- D) Class d: b2, b1

1.8 Consider the following code definition:

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

What will happen when one tries to compile this class?

- A) Will not compile, because 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 A static function

- A) should be called when an object is destroyed
- B) can be called using class name and function name
- C) can be called using object and function name
- D) is used when a dummy object is created

1.10 Redirection redirects

- A) A stream from a file to the screen
- B) A file from a device to a stream
- C) The screen from a device to a stream
- D) A device from the screen to a file

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 In C++, declaration can appear almost anywhere in the body of the function.
- 2.2 A C++ function can return multiple values to the calling function.
- 2.3 Defining a class also creates objects.
- 2.4 Members of a class specified as private are accessible only to the functions of the class.
- 2.5 Destructors should be defined by class name or constructor name.
- 2.6 If a unary operator ++ is overloaded, it makes no difference if it is used as pre or post increment with an object.
- 2.7 A member function in a base class can be accessed by an object of its derived class.
- 2.8 Pointers to an *int* and *float* are same.
- 2.9 All functions in an abstract base class must be declared pure virtual.
- 2.10 Exception means out of the ordinary or deviating from the normal course.

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  | Private                 | A. | Is the prototype of a function                                                    |
| 3.2  | Inheritance             | B. | Is used to design a single class/function that operates on the data of many types |
| 3.3  | Declaration             | C. | Is used in the base class                                                         |
| 3.4  | Calling member function | D. | Is defined and declared in the base class                                         |
| 3.5  | Polymorphism            | E. | Is the base class for most of the stream classes                                  |
| 3.6  | Virtual function        | F. | Ability of an operator to act in different ways on different data types           |
| 3.7  | Template                | G. | Means data hiding                                                                 |
| 3.8  | Destructor              | H. | Functions are automatically called when derived class object gets destroyed       |
| 3.9  | ios                     | I. | Is same as sending a message to an object                                         |
| 3.10 | stew                    | J. | Class members can be accessed only by member and friend functions of that class   |
|      |                         | K. | Is an example of manipulator                                                      |
|      |                         | L. | Is used in the derived class                                                      |

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)

|           |              |           |            |           |             |
|-----------|--------------|-----------|------------|-----------|-------------|
| <b>A.</b> | Data hiding  | <b>B.</b> | >>         | <b>C.</b> | Declaration |
| <b>D.</b> | Polymorphism | <b>E.</b> | Definition | <b>F.</b> | Arguments   |
| <b>G.</b> | Catch        | <b>H.</b> | Address    | <b>I.</b> | Pointer     |
| <b>J.</b> | Private      | <b>K.</b> | <<         | <b>L.</b> | Public      |
| <b>M.</b> | Ordinary     | <b>N.</b> | Operator   | <b>O.</b> | Constructor |

- 4.1 A function prototype tells the compiler the return type, name and \_\_\_\_\_.
- 4.2 \_\_\_\_\_ is the symbol for insertion or put to operator.
- 4.3 Memory gets allocated during \_\_\_\_\_ of a function.
- 4.4 Principal objective of OOP is \_\_\_\_\_.
- 4.5 C++ features which enables you to initialize an object on creation is called \_\_\_\_\_.
- 4.6 The keyword \_\_\_\_\_ is used for an overloaded operator function definition.
- 4.7 \_\_\_\_\_ type of declaration of a base class enables an object of a derived class to access member functions.
- 4.8 The symbol & is called \_\_\_\_\_.
- 4.9 Derived function uses a virtual function by \_\_\_\_\_.
- 4.10 C++ language uses \_\_\_\_\_ keyword to handle exception.

**PART TWO**  
(Answer any **FOUR** questions)

- 5.**
- a) Discuss the salient features of C++ in comparison to C. Explain why object oriented program is more robust than structured program.
  - b) Discuss the function overloading and its importance in C++.
  - c) Write a C++ program to declare a class called 'person' having data members- 'name', 'age' and 'salary' of the appropriate types. Write a constructor to define the value of data variables. Also write a method called *display* ( ) that will display the current values of data variables. Create two objects of this class & set their data values as follows:
    - 1. Name: Rakesh, Age: 25, Salary: 20000.00
    - 2. Name: Mitul, Age: 28, Salary: 25000.00
- (5+3+7)**

- 6.**
- a) What is inheritance? What are the types of inheritance? How can you initialize base class member through a derived class object?
  - b) Classify data types in C++.
  - c) Write a programme that reads elements of an array of ten elements and displays the largest and smallest in that array.
  - d) List some of the special properties of the constructor functions. In which direction constructors and destructors are invoked when base class is one and derived class are two?
- (6+2+3+4)**

- 7.**
- a) Declare a class matrix and write a function to read all the elements of a matrix of size m x n from the keyboard for creating objects.
  - b) Abstract class provides a base upon which other classes may be built. Justify.
  - c) What is dynamic memory allocation?
  - d) What are input and output streams? Describe various classes available for file operations.
- (5+2+2+6)**

- 8.**
- a) Write a function using reference variables as arguments to swap the values of a pair of integers.
  - b) Discuss the exception handling in C++.
  - c) Define the following terms with proper illustration:  
Object, Polymorphism, Data hiding.
- (5+5+5)**

- 9.**
- a) What is a pure virtual function? Show its use in example.
  - b) What is operator overloading? What is the use of operator overloading? If meaning of any operator is changed, will compiler generate error?
  - c) Differentiate between copy constructor and default constructor.
- (5+5+5)**