

A10.1-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 statement `char s = 'A'` will internally assign value to `s` is
 - A) 0
 - B) 90
 - C) 65
 - D) 127
 - 1.2 Condition checking in C++ can be done by using the statement
 - A) If-else
 - B) option
 - C) choice
 - D) select
 - 1.3 A relational operator
 - A) assigns one operand to another.
 - B) yields a Boolean result.
 - C) logically combines two operands.
 - D) none of the above
 - 1.4 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.
 - 1.5 If `p` is a pointer, then `p++` means

- A) Increment the value of p
- B) Increment the pointer p
- C) Increment the address of the variable to which p is pointing
- D) Increment the value of the variable to which p is pointing

1.6 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 these

1.7 Consider the following class definition

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

What happens when we try to compile this class?

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

1.8 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.

1.9 If a subclass contains a method with the same name and arguments as in the base class, it is

- A) overloading
- B) overriding
- C) polymorphism
- D) error

1.10 If we generalize functions, we get a

- A) model
- B) template
- C) structure
- D) class

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 general, switch is faster than if-else.
- 2.2 By default the members of a class are private.
- 2.3 The length of a string object s1 can be obtained using the expression s1.length.
- 2.4 All functions in an abstract base class must be declared pure virtual.
- 2.5 Throwing an **exception** always causes program termination.
- 2.6 The expression **for** (;;) is the same as a **while** loop with a test expression of **true**.
- 2.7 We cannot use the % operator to compute the remainder of an array index.
- 2.8 There is no direct mechanism to locate a sub-string in a string.
- 2.9 Static member functions are independent of objects.
- 2.10 If no overloaded operators are provided, C++ automatically provides them.

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 act of representing the essential features of something without including much detail.	A.	copy constructor
3.2	To convert a variable from one type to another type by explicitly.	B.	late binding
3.3	The constructor that creates a new class object from an existing object of the same class.	C.	printf()
3.4	The addresses of the functions are determined at run time	D.	interface
3.5	The visible method of an object.	E.	abstraction
3.6	A value, variable or expression that selects a particular element of an array.	F.	cast
3.7	Writing formatted output to stdout.	G.	overloading
3.8	The address of an actual parameter is implicitly passed to a function.	H.	flowchart
3.9	Rules that governs the construction of statement.	I.	reusability
3.10	A feature which allows to build new classes from existing classes.	J.	pass by reference
		K.	index
		L.	syntax
		M.	pass 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. (1 x 10)

A.	encapsulation	B.	ios	C.	one value
D.	class	E.	break	F.	class library
G.	delete	H.	multiple inheritance	I.	two values
J.	Scope-resolution operator	K.	data hiding	L.	virtual functions

- 4.1 If we do not write the _____ statement, even if a condition matches, switch continues execution.
- 4.2 A function is allowed to return _____.
- 4.3 The _____ usually resolves ambiguities.
- 4.4 A template argument is preceded by the keyword _____.
- 4.5 A group of related classes, supplied as a separate product, is often called a(n) _____.
- 4.6 The _____ operator is used to release memory allocated dynamically.
- 4.7 _____ allows a derived class to have more than one base class.
- 4.8 C++ achieves polymorphism through _____.
- 4.9 The base class for most stream classes is the _____ class.
- 4.10 The wrapping up of data and functions into a single unit is called _____.

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

5.

- a) What is object oriented programming? How is it different from procedure-oriented programming?
- b) What is the difference between the while and do-loops with respect to the respect to the number of times the loop executed?
- c) What is the main advantage of passing arguments by reference? Explain this with an example.

(5+5+5)

6.

- a) What is operator overloading? Illustrate operator overloading concept to concatenate strings.
- b) What is a pointer? Explain the difference between the address stored in a pointer and the value at that address.
- c) Why do we need virtual functions?

(5+5+5)

7.

- a) Explain why do we need to use constructors? Explain a copy constructor with an example.
- b) What is an exception? How is an exception handled in C++?
- c) Write a program that illustrates the application of multiple catch statements.

(5+5+5)

8.

- a) What are friend functions and friend classes? Write a normal function which adds objects of the complex number class. Declare this normal function as friend of the complex class.
- b) Distinguish between overloaded functions and function templates.
- c) How is polymorphism achieved at run time? Explain with coding.

(7+4+4)

9.

- a) What does the following statement do?
 - i) `*ptr+=1;`
 - ii) `++*ptr;`
 - iii) `(*ptr)++;`
 - iv) `*ptr++;`
- b) What do you understand by the term Abstract Data Type?
- c) Write a program to show that the declaration of a class 'Rectangle', which derives from the class 'square', which in turn derives from the class 'shape'.
- d) Explain 'Ambiguity Resolution in Multiple Inheritances'.

(4+3+4+4)