(2)

2020

(Held in 2021)

COMPUTER SCIENCE

(Major)

Paper : 5.1

(Object Oriented Programming using C++)

Full Marks: 42

Time: 2 hours

GROUP—A

(Marks : 21)

The figures in the margin indicate full marks for the questions

1. Answer the following questions : $1 \times 2 = 2$

- (a) Which programming paradigm acts behind class and object based programming?
- (b) What is the name of the mechanism that binds together the data members and member functions in class and object based programming?

2. Answer the following questions :

 $2 \times 2 = 4$

- (a) Define abstraction and polymorphism.
- (b) Distinguish between multiple inheritance and multilevel inheritance.
- **3.** Answer any *three* of the following questions :

 $5 \times 3 = 15$

- (a) Write two suitable functions that elaborate function calling by value and function calling by reference.
- (b) Define the following:
 - (i) Static data members and Static member functions
 - (ii) C++ garbage collection
- (c) What do you understand by constructor and destructor in class based programming? At what point of time does the destructor function come in effect? Give a simple example.
- (d) What is virtual function? How does it differ from pure virtual function? Give example.
- (e) Give example for integer (decimal), octal, hexadecimal, floating point and character constant each.

(3)

(4)

GROUP-B

(Marks : 21)

4. Answer any *three* questions of the following :

 $7 \times 3 = 21$

- (a) What is the importance of default constructor? Is it possible to have more than one constructor within a class? Write suitable code to show how constructor gets called during the instantiation of object in main().
- (b) Demonstrate the use of *public* and *protected* with suitable example program.
- (c) Define a class **point** with two data members **x ordinate** and **y ordinate** to represent all points in the two-dimensional plane by storing their **x** coordinate and **y** coordinate values.

 Write member functions **dist()** that returns the distance of the point from the origin, **slope()** that returns the slope of the line obtained by joining this **point** with the origin. Write constructors with zero, one and two arguments to initialize objects. Write a friend function to compute the distance between two points.

- (d) Distinguish between early binding and late binding. Describe any one of them with suitable example. Which among these bindings consume more processing time?
- (e) State the need of a template function in C++ and also give example demonstrating the implementation of generic functions in C++ using templates.

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