

(2½ Hours)

[Total Marks: 75]

- N. B.: (1) **All** questions are **compulsory**.
 (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
 (3) Answers to the **same question** must be **written together**.
 (4) Numbers to the **right** indicate **marks**.
 (5) Draw **neat labeled diagrams** wherever **necessary**.
 (6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt any three of the following:**15**

- Discuss procedure oriented programming paradigm. Also discuss its characteristics.
- What is object oriented programming paradigm? Discuss its characteristics.
- Define any two of the following
 - Classes
 - Objects
 - Data abstraction
- Discuss benefits and applications of oops.
- Explain static and dynamic binding.
- Write a short note on data abstraction and data encapsulation.

2. Attempt any three of the following:**15**

- What is a class? How a class can be defined? Discuss various ways of defining member functions of a class.
- What are objects? How they can be declared? Also discuss memory allocation for objects in object oriented programming.
- How data members and member functions of a class can be accessed. Write a program to demonstrate the concept of accessing public members of a class.
- What is a constructor? List various types of constructors. Explain copy constructor with programming example.
- Declare a class rectangle with data members as length and breadth, and member functions as getdata() to read data and display() to find and display area and perimeter of a rectangle. Also write main method to implement the class.
- What is a friend function? How it can be declared? What are its characteristics?

3. Attempt any three of the following:**15**

- Define function overloading and operator overloading. Write down the rules for overloading operators.
- Write a C++ program to add two complex numbers by overloading binary + operator.
- What do you understand from data conversion between objects and basic types? List various type conversions.
- Write a C++ program to demonstrate conversion from user defined to basic data type.
- What is this pointer? Write a C++ program to demonstrate use of this pointer.
- What are virtual functions? What are the rules for writing virtual functions?

4. Attempt any three of the following:**15**

- What is inheritance? Discuss different forms of inheritance.
- Discuss public, private and protected data members and member functions. When to declare which type of data members/member functions.
- Write a C++ program to demonstrate use of hybrid inheritance.
- What is an exception? Explain exception handling mechanism in detail.

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- e. What happens when raised exception is not caught by catch block? Explain with suitable example.
- f. Write a C++ program to show use of multiple catch statements.

5. Attempt any three of the following:

15

- a. Explain various methods to detect end of file.
 - b. Write a program to open two files country and capital simultaneously and print the name of the capital in front of the country.
 - c. Explain the use and purpose of following functions
 - (i) seekg() and seekp()
 - (ii) tellg() and tellp()
 - d. What are class templates? Explain their use. How they can be declared?
 - e. Define a class named vector. Illustrate the use of vector class template for performing the scalar product of int type vectors as well as float type vectors.
 - f. What is a function template? Write a C++ program to demonstrate the use of function templates?
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