(3 Hours) **[Total Marks: 80]**

N.B.: (1) Question No. **1** is **Compulsory.**
(2) Attempt any **three** questions from the remaining **five** questions.
(3) Answers to **sub-questions** should be **grouped** and written **together.**

Q.1 (a) What is operator Overloading? Write a class to handle fractions such as "1/3." Overload + and – operators to add and subtract these fractions. For example: 1/3 + 1/2 = 5/6. **10**

(b) Explain the concept of multiple inheritance. What are ambiguities in multiple inheritance and how will you resolve them. **10**

Q.2 (a) What are Programming Paradigms? Explain difference between Procedure Oriented and Object Oriented Programming. **10**

(b) What are constant Data Members and Constant functions? Explain with suitable example. **10**

Q.3 (a) Write a class called Factorial. This class defines a method called factorial() which takes as its only parameter an int called n, and returns an int representing the factorial of n. The factorial of an integer n, denoted n! is defined as n * (n − 1) * (n − 2) *... * 1 (but note that 0! is 1). You MAY assume that n is a non-negative integer. **10**

(b) Explain use of ifstream,ofstream and fstream classes in detail with an example program of each. **10**

Q.4 (a) Explain use of null, void and dangling pointer with an example of each. **10**

(b) Explain the concept of 1) Virtual Functions 2) Friend Functions **10**

Q.5 (a) What are namespaces? Explain steps to create your own namespace with an example. **10**

(b) What are Strings? How will you create strings in C++? Explain various functions available in built in String class. **10**

Q.6 Write short notes on any **four** :-- **20**

(a) Bitwise operators in C++
(b) Class Templates
(c) Inline Functions
(d) File opening modes
(e) New and delete operator
