

Full Marks : 70

Time : 3 hours

Answer Q. No. 1 which is compulsory and any five questions from the rest.

The figures in the right-hand margin indicate marks.

1. Answer all questions :

- (i) What is the application of the scope resolution operator in C++ ? Give an example.

:: To access a variable globally.
dynamic allocation of runtime
- (ii) What are the advantages of using new operator as compared to the function malloc() ?

function body inserted in place of function call.
- (iii) How does an inline function differ from a preprocessor macro ?

only symbol replaced as per macro (substitution)
- (iv) What are templates ? Explain the need of templates with an example.
- (v) Distinguish between the following two statements where T1 and T2 are objects of time class :

time T2 (T1); → T2 is created & copy constructor is invoked
time T2 = T1; → member by member T1 members are copied to T2.
operations are defined only for basic data types.
To avoid duplication in multiple inheritance
- (vii) What is a virtual base class ? When and why do we make a class virtual ?
- (viii) What is an exception ? How is an exception handled in C++ ?

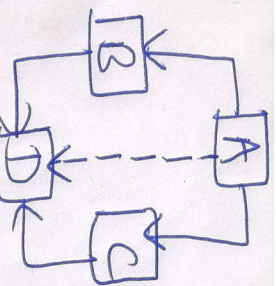
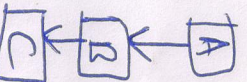
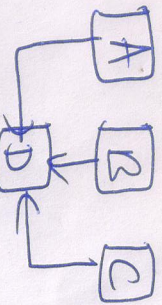
Standard Template Library
try, throw, catch block
- (ix) What is STL ? What are its components ? List the three types of containers in STL.

Containers
Sequence
Associative
Derived
- (x) What is a container class ? Give an example.

class that has objects of other classes as data members is called containers
- (a) Write a program to declare three classes. Declare integer array as data member in each class. Perform addition of two data member arrays into array of third class using friend function.

same function name & different arguments.
- (b) What is function overloading ? Write a program using function overloading to find the sum of integer and floating-point numbers.

5



3. (a) Differentiate between multiple, multi-level and multipath inheritance with suitable examples. 5

(b) Write a program to create a dynamic object. 5

4. (a) What is a virtual destructor? Give an example. Can a constructor be virtual? No! 5

(b) Write a program to define class A, B and C. The class C is derived from classes A and B. Define count () member function in all the classes as virtual and count number of objects created. 5

5. (a) Write a program to overload prefix and postfix operators. 5

(b) Write a program to evaluate the equation $A = B * 3$, where A and B are objects of same class using friend function. 5

6. (a) What are pure virtual functions? Write a program to demonstrate pure virtual functions. virtual destructor = 0 5

(b) Differentiate between static and dynamic polymorphism. Write a program to demonstrate the use of abstract classes. no body func / dummy func / do nothing func 5

7. (a) Write a program to create a template to find the maximum value stored in an array. no object is declared for that belongs 5

(b) Write a program to demonstrate the concept of rethrowing an exception. 5

8. Write short notes on (any two) : 2 x 5

(a) Qualifier and nested classes.

(b) Object Slicing.

(c) Copy constructor.

Static polymorphism → function calls are decided at compilation time.

Dynamic polymorphism → function calls are decided at runtime.