

**MCA - 2**  
**OOPUC++**

**Set - 2**

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 :

2x10

- (i) What is the application of the scope resolution operator in C++? Give an example.
- (ii) What are the advantages of using new operator as compared to the function malloc()?
- (iii) How does an inline function differ from a preprocessor macro?
- (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 ); -  
time T2 = T1; -
- (vi) What is operator overloading? Why is it necessary to overload an operator?
- (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++?
- (ix) What is STL? What are its components? List the three types of containers in STL.
- (x) What is a container class? Give an example.

- 2. (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. 5
- (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? 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. 5
- (b) Differentiate between static and dynamic polymorphism. Write a program to demonstrate the use of abstract classes. 5
- 7. (a) Write a program to create a template to find the maximum value stored in an array. 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.