

**M.Sc. (INFORMATICS) / III Semester 2017**  
**PAPER IT-34-OBJECT ORIENTED TECHNOLOGY**

TIME: 03 hours

Max Marks: 75

(Write your Roll No. on the top immediately on receipt of this question paper)

**Note: Attempt any five questions. All questions carry equal marks**

**(Programming should be in C++)**

Q1. Explain with suitable examples

- a) List five important features in your opinion, that a software developer should keep in mind while designing an Object Oriented system?
- b) Explain with an example the concept of rethrowing an exception.
- c) What are abstract classes in C++? How do you declare the same?
- d) What is a namespace? What are its benefits?
- e) What are function objects? Explain its benefits with example.

(3x5)

Q2. a) Create a user defined class STRING (storing char \*str, int len as members).

Define default, Parameterized and Copy constructors. Define Operator Overloading functions to perform string operations (+ for concatenating two strings, += for updating the same string, == check for equality, < for less than and > for greater than). Display the content of STRING overloading << operator. Write main function to test the same.

(12)

b) List Operators that can't be overloaded using friend function? Why?

(3)

Q3. a) When do we use protected visibility specifier to class member?

Explain with an example.

(3)

b) Explain with an example problems created by multiple inheritance.  
How can they be resolved?

(3)

c) A base class has data members however, a class that is derived from it doesn't. Does the derived class need a constructor? Why?

(3)

d) Write a C++ program to create a Vector of names. Display the contents of vector. Use Sort algorithm to sort the contents of Vector. Display the contents of sorted Vector. (6)

**Q4. a)** Write a function template for binary search function. The function should be able to search an element in array of elements (Test the function on int, char \*, Employee data(Id, name salary types)) (8)

**b)** What is a Virtual Destructor ? Why and when Virtual Destructor is necessary? Explain with example. (3)

**c)** Why should default values be given to function arguments in function's prototype and not in the function's definition? Explain with example. (4)

**Q5. a)** A file named 'Input.txt' contains a list of words. Write a program that reads the content of the file one word at a time. Check if the word is a palindrome. If the word is a palindrome write it the output file 'Output'. (10)

**b)** Design a user-defined manipulator which provides following specifications (5)

- 8 columns width
- Right justified
- 3 digit precision
- Filling unused places with '\*'
- Trailing zeros and + sign before positive numbers shown

**Q6. a)** Create two classes DM and DF which store value of distances. DM stores distances in meters and centimeters and DF stores in feet and inches. Write a program that reads values for class objects and add one object of DM with another object of DF and give result in DM. (7)

(Hint: Use friend function to carry out addition operation. The object that stores the result is DM object.  
1 inch = 2.54 centimeters)

**b)** What is the difference between the functions that overload the increment operator in prefix and in postfix formats? (4)

**c)** What is mutable keyword? Explain the same with example. (4)