IC-1834

M.Sc. (INFORMATICS) / III Semester 2018 Roll No. 4158

PAPER IT-34-OBJECT ORIENTED TECHNOLOGY

TIME: 03 hours Max Marks: 75

Write your roll no. top to the Q. paper (Attempt all parts of a question together)

Note: Attempt any five questions. All questions carry equal marks (Programming should be in C++)

Q1. Explain with suitable examples

a) What are the main features of **Object-based programming**? How is it different from **Object Oriented Programming**?
b) When is **catch(...)** handler used ? What should be kept in mind while using this handler?
c) What is a **friend** class? How is it declared and what are its benefits?
d) How do we find the class type of a particular object?
e) What are **function pointers**? Explain their benefits with an example. **(3x5)**

Q2. a) Create a class **MATRIX** using two dimensional dynamic array(int row, int col, int** p, int sum as members, where row -no of rows, col – no of columns, p – dynamic array, sum – sum of all elements of array). Define all possible matrix opeartions (addtion, subtration, mutliplication, transpose) on Matrix class using operator overloading functions. Define Constructor, Copy Constructor, Destructor. Perform appropriate error handling where required. Display content of Matrix overloading << operator. Write main function to test the same. **(10)**

b) What are two ways of converting an object of one class to an object of another? Explain with suitable example. What problems can arise if both are used at the same time? **(5)**

Q3. a) A derived class inherits from various base classes some of them virtual as well. In what order are the constructors called when a derived class object is created? Explain with example **(3)**
b) What is **pure virtual function**? When is it needed? Explain with suitable example. **(3)**
c) What are **local classes**? What are some of the restrictions in local classes? **(3)**
d) Write a C++ program to create a List of names using **List Container**. The list shouldn't have any duplicates. Use find algorithm to check if a particular name is in the List. Add to List only if the name doesn't exist. Display the list. **(6)**

Q4 a) Write a **function template** that returns the minimum and maximum elements of an array as function arguments. Function should take two input arguments the array and the no of elements and return output arguments, the minimum and maximum elements of the array (Test the function on int, char *, Employee data(Id, name salary types), compare elements on salary) **(8)**
b) Can ***this*** Pointer be deleted? Explain its usage with suitable example. Can we delete this pointer? **(3)**
c) How do we use default arguments in a function? Explain the benefits. In what functions we can't use the default arguments? **(4)**

Q5. a) A file named 'Company.txt' contains a list of Companies (Company_Name, Address, No_of_Employess, GST_IN, Turnover, Phone_no, CEO_name). Write a program that performs the following functions:
i. Display the contents of file reading details of one company at a time.
ii. Add a new company and its details
iii. Change the phone of the fifth company in the list
iv. Ask user to enter a name and check if a company exists whose CEO is the name entered.
Test the program with suitable data. **(12)**

b) What is the basic difference between manipulators and **ios** member functions in implementation. Give examples. **(3)**

Q6. a) Write a program that reads a list of countries in random order, stores them and displays them in alphabetic sequence. Use **string** class, its comparison operator and functions as defined in C++. **(6)**
b) When and how does the C++ compiler generate an actual class definition from its template? Explain with suitable example **(3)**
c) What is explicit keyword? Explain the same with example. **(3)**
d) What is memory leak? What can be done to prevent memory leak when classes are inherited? **(3)**