

CBCS Scheme

USN

--	--	--	--	--	--	--	--	--	--

16MCA22

Second Semester MCA Degree Examination, June/July 2017

Object Oriented Programming Using C++

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the five basic data types of C++ along with their size in bits. (04 Marks)
- b. What are const and volatile qualifiers? Give an example. (04 Marks)
- c. Write a program to implement stack operations. Use constructor and destructor for the stack class. (08 Marks)

OR

- 2 a. Explain the four principles of object oriented programming. (04 Marks)
- b. Write a program which overloads a function for calculating the perimeter of geometrical figures like square, rectangle and triangle. The formulae for perimeter of a square is $4 \times \text{side}$, for a rectangle is $2 \times (\text{length} + \text{breadth})$ and for a triangle is sum of its three sides respectively. (06 Marks)
- c. Explain the concept of a static data member and a static member function with a suitable example. (06 Marks)

Module-2

- 3 a. Create a student class with three data members: student name, USN, percentage. Create an array of student objects, enter the details for the students and display the details. (05 Marks)
- b. Explain the concept of pointer to an object with an example. (05 Marks)
- c. What is a copy constructor? Give an example of initializing the elements of an integer array. (06 Marks)

OR

- 4 a. Write a program to find the difference of two numbers using default arguments. (04 Marks)
- b. Explain the usage of reference parameters with an example of swapping two numbers. (06 Marks)
- c. Explain the usage of dynamic allocation operators new and delete with an example. (06 Marks)

Module-3

- 5 a. Create a class called MATRIX using two dimensional array of integers. Implement the following operators by overloading: The operator = which checks the compatibility of two matrices to be subtracted. Overload the operator '-' for matrix subtraction as $m_3 = m_1 - m_2$ when $(m_1 = m_2)$. (08 Marks)
- b. Create a class called complex which has two data members real part, imaginary part. Implement a friend function for overloading '+' operator which can compute the sum of two complex numbers and the function returns the complex object. (08 Marks)

OR

- 6 a. Create a base class base with two protected data members i and j and two public methods setij() and showij() to set the values of i and j and display the values of i and j respectively. Create a derived class which inherits base class as protected. Show how derived class object sets the values of i and j and display their values. (08 Marks)
- b. What is the need for a virtual base class? Show how a virtual base class eliminates ambiguity. (08 Marks)

Module-4

- 7 a. How is run time polymorphism implemented in C++? Create a base class with a function fun1() defined in it. Show how fun1() can be overridden during runtime. (08 Marks)
- b. What is a generic function? Write a generic function to implement bubble sort on an array of integers and an array of doubles in ascending order. (08 Marks)

OR

- 8 a. What is an exception? Handle the exception when a division by zero occurs. (08 Marks)
- b. Give an example for handling derived class exceptions. (08 Marks)

Module-5

- 9 a. Mention the four built in streams in C++. Give an example of setting two format flags in ios. (05 Marks)
- b. Give an example for creating our own manipulator function. (05 Marks)
- c. Create an inventory file and write 3 items and their respective costs in it. (06 Marks)

OR

- 10 a. Create a student file and enter 3 students data like their USN and total marks. (05 Marks)
- b. Explain the three foundational items of STL. Give one example of each. (06 Marks)
- c. Create a vector of char of size 10 and assign the values to the elements of vector. (05 Marks)

* * * * *