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13MCA22

**Second Semester MCA Degree Examination, June/July 2017**  
**Object Oriented Programming using C++**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

- 1
  - a. Explain the salient features of object oriented programming languages. (10 Marks)
  - b. What are qualifiers? Illustrate them with examples. (05 Marks)
  - c. What are inline functions? Discuss the advantages of inline functions with example. (05 Marks)
  
- 2
  - a. What is a generic function? Write a C++ program to create a template for swapping two variables. (06 Marks)
  - b. What are various parameter passing mechanisms for function? Explain each with an example. (10 Marks)
  - c. Write a short note on enumerated data types. (04 Marks)
  
- 3
  - a. Explain static class data item and static member functions of a class. (08 Marks)
  - b. Define friend functions in C++ and discuss why are they used? Write a C++ program. (08 Marks)
  - c. Write short notes on 'this pointer'. (04 Marks)
  
- 4
  - a. Write a C++ program to create a class called STACK using an array of integers. Implement the following operations by overloading '+' and '-' operators:
    - (i)  $S1 = S1 + \text{element}$ ; where S1 is an object of class STACK and element is integer to be pushed on top of stack. (10 Marks)
    - (ii)  $S1 = -S1$ ; - operator pops the element. Handle stack empty and full conditions. (05 Marks)
  - b. Explain default constructor and copy constructor. Discuss its difference with an example program. (05 Marks)
  - c. Explain dynamic memory allocation and de-allocation of arrays with an example program. (05 Marks)
  
- 5
  - a. What do you mean by array of pointers to objects? Explain with an example program. (10 Marks)
  - b. Write a C++ program to create a class called STRING and implement the following operations. Display the result after every operation by overloading <<.
    - (i) `STRING S1 = "VTU"`
    - (ii) `STRING S2 = "BELGAUM"`
    - (iii) `STRING S3 = S1 + S2` (Use copy constructor) (10 Marks)
  
- 6
  - a. What is inheritance? What are the types of inheritance? Explain how multiple inheritance is implemented in C++ with example. (10 Marks)
  - b. What is virtual function? Illustrate with an example, the usage of virtual functions. (06 Marks)
  - c. What are abstract classes? Explain their use in C++. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

- 7 a. What are I/O streams in C++? Give stream class hierarchy. (10 Marks)  
b. Write a C++ program using files to seek a particular position in file. (10 Marks)
- 8 a. What do you mean by exceptions and exception class? Give its syntax and discuss about handling exception with an example program. (10 Marks)  
b. What do you mean by lists? Discuss any 3 member functions that can be used on lists with example program. (10 Marks)

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