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BE-III/12(A)

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COMPUTER/ I.T. ENGINEERING COURSE NO. COM – 301
(OOAD with C++)

Time Allowed: 3 Hours

Maximum Marks: 100

Note: Attempt five questions in all selecting at least two questions from each Section. Each question carries 20 marks.

SECTION – A

1. (a) What is meant by data hiding? How it is achieved?
(b) Compare procedural programming with object oriented programming.
(c) Write a class named 'Fibonacci' to generate first 'n' Fibonacci numbers. Use necessary member variables, member functions and constructor. Test this class in the main program. (5, 5, 10)

2. (a) Write a program in C++ to declare three classes S1, S2, and S3. The classes have a private data member variable of character data type. Read strings for the classes S1 and S2. Concatenate the strings read without using library function and assign it to the data member variable of class S3.

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(2)

(b) What is a friend function? Explain this with an example. What are the merits and demerits of using Friend function? (10, 10)

3. (a) Write a program in C++ which read a matrix of integers and then perform following operation:

- (i) Print the norm of a matrix
- (ii) Print the highest and lowest in a matrix
- (iii) Print the matrix after arranging the rows of a matrix in ascending order.
- (iv) Count the number of -ve, +ve and zeros in a matrix.

The program should have a constructor and destructor.

4. (a) What is Copy constructor? Develop an object-oriented program in C++ using the concept of constructor and destructor to prepare the mark sheet of a university examination with the following items read from keyboard: Name of student, Roll Number, Subject and Internal Marks. Also calculate CGPA.

(3)

- (b) Write a program in C++ by OOP approach to print the Pascal Triangle of 10 rows. (10, 10)

SECTION – B

5. What is operator overloading? Why is it necessary to overload an operator? Create a class complex that will contain complex numbers. Use operator overloading to create addition, subtraction and multiplication operators which will operate on Complex.
6. (a) What is virtual base class? When and why is it required to inherit a base class as virtual? Write a program in C++ to show the implementation of virtual base class.
- (b) What are virtual function and pure virtual function? Where are they used? (10, 10)
7. (a) Consider an example of a Banking System. Design a class called Bank that has data members such as those representing account number, name A/C Type, branch, Balance amount etc. Derive a 'Deposit' class

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(4)

from Bank for depositing the amount into that account and to maintain the balance. Also, derive a 'Withdrawal' class from Bank for withdrawing the amount from, that account and to maintain the balance. Now derive a 'Statement' class from both Deposit and Withdrawal to print the complete bank statement of the specific account holder with all transactions. Write an interactive program for N customers using appropriate inheritance mechanism.

- (b) Write a program which copies the contents of one file to a new file by removing unnecessary spaces between words. (10, 10)
8. (a) What is meant by inheritance? Write a programme in C++ to illustrate the difference between multiple and multilevel inheritance.
- (b) What are file modes? Describe various file mode options available in C++? (12, 8)
