Course Code : CST 256   QVRU/RS – 22 / 1163

Fourth Semester B. Tech. (Computer Science and Engineering) Examination

OBJECT ORIENTED PROGRAMMING

Time : 3 Hours]   [Max. Marks : 60

Instructions to Candidates :—

    (1)   Support your answers with proper code wherever required.

    (2)   Assume suitable data wherever required.

1.   (a)   Differentiate between Abstraction and Encapsulation with example.

                                      3 (CO 1)

    (b)   Create a class A1 which has data members int i and float k. Design class A1 in such a way that count variable counts the number of objects created. A1 has method "print" which prints the number of objects created. Design the print method as it can be called without creating the object. Add the method "operation" which adds two A1 objects (int with int and float with float) and returns the result.

            Example :

            Object O1 : i = 3, k = 3·2

            Object O2 : i = 5, k = 1·5

            Result : i = 8, k = 4·7

            Write appropriate main( ) to test all functionalities.   7 (CO 1)

2.   (a)   (i)   Why super( ) should be the first statement in constructor of derived class ?

            (ii)   Differentiate between abstract class and interface.   3 (CO 2)

(b) Design a class MyNumber which represents a numeric value and operations as follows :

ReturnType	Method	Arguments
MyNumber	add	(MyNumber n)
MyNumber	multiply	(MyNumber n)

Derive a class ComplexNumber from MyNumber with an additional imaginary variable and override add and multiply methods to perform addition and multiplication of two ComplexNumbers. 7 (CO 2)

3. (a) Differentiate between checked and unchecked exception. Explain with proper example. 3 (CO 2)

(b) Design a class Employee with data members as Name(String), ID(Integer) and Salary(Double). The information Name, ID and Salary is already stored in the file "EMPLOYEEDATA". Read this data and store in Employee Array. Display the details of employee with highest salary. 7 (CO 3)

4. (a) Discuss with an example why we require generics in java. 3 (CO 2)

(b) Create a class Product with product name and quantity. Store 5 products in a Treeset. Display the products in ascending order quantity. 7 (CO 2)

5. (a) Demonstrate various ways you can create threads in Java. 3 (CO 3)

(b) Designs a solution using interthread communication for producer consumer problem. 7 (CO 3)

6. (a) What are Design Patterns ? Discuss the 4 essential elements of design pattern. 3 (CO 4)

(b) Explain Bridge Design pattern with proper example. 7 (CO 4)