

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION-JUNE-2016

B.Tech VI Semester

COURSE CODE: 10B11CI614

MAX. MARKS: 35

COURSE NAME: Object-Oriented Systems and Programming

COURSE CREDITS: 04

MAX. TIME: 2 HRS

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

1. Define a template class *VariableArray* in C++ to create a variable size array. The class must have the following functionalities:
 - a. *addElement(element)*: to insert an element. (First element is inserted at the index number 0, second element at the index number 1 and so on).
 - b. *deleteElement(element)*: to delete a specified element
 - c. *deleteElementAt(i)*: to delete an element at the index number *i*.
 - d. *deleteLast()*: to delete the last element
 - e. *deleteFirst()*: to delete the first element[6 marks]
2. Define a *Time* class in Java with members as: *hour*, *minute* and *second*. Enter the time when a user started an online test and completed the test. Subtract two time values and display the duration in which the test was completed. Throw exception if the start time is greater than the completion time.
[4 marks]
3. Define a class *Shape* in a package *user/pack1/pack2*. This class has the methods as *enterData()* and *displayArea()*. Define a class *Rectangle* in the package *user/pack1* that imports and inherits the *Shape* class. Now import the class *Rectangle* in your own directory (*user*) to invoke its methods in the main class.
[5 marks]
4. Define a thread class *Numeric* to display number from 1 to 26. Now define another thread class *Alphabet* to display the alphabets from A to Z. Which one of these threads would be executed first while invoking the run methods of both the classes?
[4 marks]
5. Differentiate between the following terms in Java.
 - a. Abstract class and Interface
 - b. *throw* and *throws*
 - c. *final* and *finally*[6 marks]
6. A hospital wants to computerize appointments with doctors. A hospital has a panel of doctors in different specializations (eye, skin, orthopaedics, etc.). An appointment is done through telephone, e-mail, SMS, in person, as well as on-line. There are two shifts (Morning and Evening). Not more than twenty five patients are given an appointment with one doctor in any shift. If the number exceeds twenty five, the appointment is fixed for the next day. The system generates daily and weekly reports showing the name of doctors, name of patients and date of appointment. Perform the following activities for the problem description given above:
 - a. Draw a use-case diagram. [5 marks]
 - b. Identify all the classes and draw a class diagram. [5 marks]