JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
T2-EXAMINATION–OCTOBER 2019

B. Tech (CSE/IT) Semester V

Course Code: 18BIWCI535 **Max. Marks: 25**
Course Name: Python Programming and Applications
Course Credits: 3 **Max. Time: 1 Hour 30 Minutes**

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

1. Define a class *Employee* with members as *roll number*, *name,* and *age*. The class consists of a default constructor, a method *enterData()* to enter the details of the employee through keyboard and a method *displayData()* to display the details of the employee. The statement(s) inside the *enterData()* function throw user-defined exception called *EmployeeException* if the following conditions occur: (CO-3)
   - The age of the employee is greater than 60.
   - The name entered contains any numeric or special character.

   Also, write and read the object of Employee class into/from a text file "emp.txt". **[6 marks]**

2. Define a class *Complex* with data members as *real* and *imaginary*. The class also consists of two methods: *getData()* and *putData()* to enter and display the complex number, respectively. Now, make this class as a Singleton class (i.e., the Complex class can be instantiated only once). One should also be able to invoke the methods *getData()* and *putData()* methods of the class *Complex*. (CO-3) **[6 marks]**

3. Define a car class that contains data members as *model_no*, *owner*, and *price*. Define appropriate member functions as follows: (CO-4)
   - Define '+=' operator such that it increments the price of the car by 10 percent.
   - Define '-' operator such that it reduces the price by 20 percent.
   - Define '==' operator such that it checks if two cars are of same model and of same price.

   [6 marks]

4. Write a synchronized multithreaded producer/consumer program in which a producer thread writes a sequence of numbers (1 to 4) into a shared buffer (a memory location shared between multiple threads). The consumer thread reads this data from the shared buffer then displays the data. Each value the producer thread writes to the shared cell should be consumed exactly once by the consumer thread. The program should ensure that the consumer waits for the producer to execute first. The program's output should display the values that the producer writes (produces) and that the consumer reads (consumes). (CO-4) **[7 marks]**