Ref. No.

BCSE 2nd Year 2nd Semester Examination, 2020-21

Advanced Object Oriented Programming

Full marks: 70 **Time: 3 hours**

Instructions

- **Do not mix up the questions of PART A and PART B. All parts of any individual question should be written together.**
- **Arrange the pages in sequence and form a single pdf.**
- **File name will be last two digits of your class roll followed by your first name. Additionally, for Lateral Entry students file name must start with L and for readmitted students file name must start with R.**
- **On the top of the first page write your Class Roll Number , Exam Roll Number (if available) and Name.**
- **Send the answer script at: sksjuexam@gmail.com**

Part A (answer w.r.t. JAVA) -- 35 Marks

CO1 Conceptualize the object oriented features [10]

1. a) Consider s1 and s2 are referring to the instance(s) of same class in Java. Compare: i) s1==s2 and ii) s1.equals(s2) 2
   b) In java, how can you do certain activity at the time of object destruction? 2
   c) In Java, consider a class X has a public method f(int). Class Y extends X and contains a public method f(float). Now consider the following code snippet:
   int i; float fl;
   Y c=new Y(); c.f(i); X b=c; b.f(fl);
   Explain, the calls for method f(). 3
   d) What is the utility of inner class in Java? 2
   e) What is the use of finally in Java? 1

CO2 Understand and Develop concurrent programming [Answer either Q.2 or 3] [7]

2. a) How can you specify the code for a thread and data on which it works? 3
   b) notifyall() may be preferred over notify() – explain with a scenario. 4

or

3. There is a list of items that stores itemcode, itemname, rate and quantity stock for different items. Multiple viewers can view the information without any restriction. But update (changing the quantity stock) on a specific item cannot be done

simultaneously. Simultaneous update on different items can take place. Design the classes and write down the skeleton code. 7

CO3 Understand and Develop event driven programming [Answer either Q.4 or 5] [8]

4. a) Compare panel and frame. 3
   b) Write down the code snippet for an applet/application to display a window for the following. A set of options are to be shown and user can select only one from those options. Once user clicks on OK button, the selected option has to be displayed on a message box. 5

or

5. a) In a GUI program in java how can you make a text field read only? In such case how can you put the content there? 2
   b) Consider a list kind of interface in GUI program in Java that allows multi selection. Write down the code snippet for an applet/application to add a scrollbar with it and also to find out the selected items. 6

CO4 Design and implement object oriented solution for problems [Answer either Q.6 or 7][10]

6. a) Suppose there is a user defined class STUDENT with roll, name and score as attributes. Objects are to be stored in a binary file. Design the necessary class for that. Write down the code in Java to display all the objects from the file. 7
   b) Suppose a collection in Java holds STUDENT objects. In order to use the contains() method of the collection , explain the measures that will you take? 3

or

7. a) How does interface help in designing a solution? How does concept of package help in organizing a software solution? 3
   b) Suppose a collection in Java holds STUDENT objects. STUDENT has roll, name and score as attributes. Depending on the requirement collection may be sorted on roll (ascending/descending) or score (ascending/descending). Write down the code snippet to support the requirement. 5
   c) How can you set the priority for the elements in a priority queue? 2

Part B (answer w.r.t. Python) -- 35 Marks

Answer Question 8 and one alternative for each of the remaining questions. ***[7+4 X 7 = 35]***

8. Answer any 2 among following questions : 2 X 3.5=7
   a. Compare List and Tuple sequences in Python. 3.5 [CO1]
   b. Discuss the following methods associated with the file object
      a) read() b) readline() c) readlines() d) tell() e) seek() f) write(). 3.5 [CO1]
   c. How does Generalization differ from Encapsulation. Explain with examples in Python. 3.5 [CO1]
   d. Explain try, catch and finally block with an example in Python. 3.5 [CO1]
   e. Write a Python program to read lines from a file, break into tokens and convert the tokens to unique numerical values using Python dictionary. 3.5 [CO1]
9. Discuss different mutable and immutatble data types in Python. 7 [CO1]

   or

   Discuss advantages of Python over Java as an Object Oriented Programming Language. 7 [CO1]
10. Search for palindrome and unique words in a text using class method and string method. 4+3=7 [CO4]

    or

    Write first seven Fibinacci numbers using generator next function/ yield with a class in python. Trace and memorize the function. Define pickling and unpickling in Python. 4+3=7 [CO4]
11. In Python, explain the accessibility of the members of a class across the other classes within and outside the package. Explain multiple inheritance in Python with an example. 3+4=7 [CO1]

    or

    What is operator overloading? Write a class in Python to represent complex numbers with necessary constructors. Write methods or functions for the following:
    Overloading the operator "+".
    Overloading the operator "*".
    Overloading the operator "<<" so that a complex number is displayed in "a+ib" form.
    Overload ">" operator. A complex number "a+ib" is greater than "c+id" if "a2+b2" is greater than "c2+d2". 3+4=7 [CO1]

12. How multiple threads are created and ended in Python? How will they synchronize? Discuss these with an example to solve the producer-consumer problem.

Producer and Consumer are the two entities here who share the same buffer. The producer can either go to sleep or discard data if the buffer is full. The next time the consumer removes an item from the buffer, it notifies the producer, who starts to fill the buffer again. In the same way, the consumer can go to sleep if it finds the buffer to be empty. The next time the producer puts data into the buffer, it wakes up the sleeping consumer.An inadequate solution could result in a deadlock where both processes are waiting to be awakened. 7 [CO2]

or

Write a Python program to design a simple connectionless server, explaining the connectionless service. 7 [CO2]