# Final Assessment Test – April 2019

VIT® Vellore Institute of Technology

Course: CSE1007 - Java Programming
Class NBR(s): 5769 / 5773 / 5780 / 5876 / 6093
Time: Three Hours

Slot: D1+TD1
Max. Marks: 100

**Answer any TEN Questions**
**(10 X 10 = 100 Marks)**

1. The Point of Sales Terminal software requires to print the cumulative total amount of a purchase to be amassed from a customer by providing the accompanying information in its display to customize the payment easy. Develop a Java Program to display the denomination of the total amount in minimum number of notes of currency (Rs.2000/-, Rs.1000, Rs.500/-, Rs.200/-,Rs100/, Rs.50/-, Rs.20/-, Rs10/-, Rs.5/,Rs.2 and /Rs.1).

   **Sample Input:** Enter the Currency: 15453
   **Expected Output:** List of Currency Notes ->
   Rs.2000 x 7
   Rs.1000 x 1
   Rs.200 x 2
   Rs.50 x 1
   Rs.2 x 1
   Rs.1 x 1

2. The Tariff about the Highway Toll Gate has been defined in an abstract class named "TollGate". Implement the scenario with Java classes and It includes the followings.

   (i) A static int **counter** to count the total no. of any type of vehicles (Heavy, Light) passing through the toll gate. Another static float variable **totamt** to store the total amount collected by the TollGate

   (ii) Define an abstract method to **findTotalAmount()** collected for each type of vehicles and define an instance variable named **reg_number** a string type to hold the registration number of the vehicle.

   (iii) Extend the Class **Hvehicle** that defines the Vehicle charge Rs.80/- as a final type from Tollgate and extend another class **Lvehicle** that defines vehicle charge as final type of R.50/from the Tollgate. Use the base class constructor to assign the registration number of the vehicle.

   (iv) With the help of menu driven Test Class, Create objects for each of the vehicles passing through Tollgate using an array of objects and then calculate the total money collected through each type of vehicles. Apply the polymorphic principle to create object reference array of TollGate and refer the objects created by each of sub type classes. At the end of the day display the collections towards each type and total no of vehicles crossed the tollgate.

3. Create an user defined exception PluralException that should be raised/thrown whenever any reference is made to access a word / String which is ending with the letter 's' or 'S'. When the exception is thrown it has to display the exception message along with that plural word. With the help of constructor and toString() method in exception class, Develop a Java Program to test the occurrence of such custom exception in a Test Class with the use of try, catch, throw and throws.

4. Assume that there are 3 different domain specific text files store the textual matter about its domain in the form of lines of text, namely Sport.txt, Politics.txt and Clinic.txt. Apply the query likelihood estimation to calculate the scores of a given query Q (string) in each of the above 3 documents. Use the formula for to find the score.

$$P(Q, D_j) = \prod_{i=1}^{n} P(q_i|D_j)$$

$P(Q, D_j)$ = Score of the Query Q matched with $j^{th}$ Document D.
$\prod_{i=1}^{n} P(q_i|D_j)$ = Product of the count of each $i^{th}$ query term of query 'q' in the $j^{th}$ Document D. if the query term is not exist in the document add 1 as the smoothing factor to the count.
Simulate the process of find the scores of a query Q in each of the Document D with the help of Multi Thread, where each thread estimate the score for a single document. Create three threads which will have the context of accessing the query and start finding the score in parallel with the help of Java Threads.

5. Use the Java Collections or String handling methods to Estimate the Cosine Similarity between two given Strings S1 and S2 using the Following formula by Java Program.

$$COS\ (S1,S2) = \frac{\sum_{i=1}^{n}(a_i, b_i)}{\sum_{i=1}^{n} a_i{}^2 \sum_{i=1}^{n} b_i{}^2}$$

Whereas n= Total No of Unique Words in the String S1, S2
$a_i$=Frequency Count of the $i^{th}$ word in the String S1
$b_i$=Frequency Count of the $i^{th}$ word in the String S2

6. Design and develop a Dictionary named "JavaBuzzDict"using Hash Map in Java, where as it stores Java Keywords (key) along with its description as string sentence (value). While adding such keywords in to the dictionary, if the keyword already exists in the dictionary which will add the given description along with the concatenation of previous description of the word. If the keyword does not exist, simply add the new description on to the library in respect of the keyword.Get an input keyword and iterate the Hash table to display its complete description.

7. Demonstrate the implementation of JavaFX application with illustrated example of event handling.

8. Develop a Java Program that will Interface the Database named "IMDB" through JDBC-ODBC driver to store the information about the Movie Ratings in table "movie" with the fields namely "Title, Votes and Rank "of all the movies in unsorted format.
   i) Write a front end with HTML / Console program to read the search word of the Movies in the title and pass the request to call the servlet" [5]
   ii) This servlet should process the request and response the service by displaying the recommendation of Top 100 movies matching with the search word in the title of the movie. [5]

9. What is JSP? Demonstrate and explore the use of JSP Scripting Components with code snippets.

10. Simulate the Game "Guess your number "with servlet. The servlet should generate a random number that is the number guessed by the servlet and the same number is used for keep track of the sessions of each player (human). Allow maximum of five rounds to guess the number by displaying the clue for each round regarding the relative quantity of the number (greater than/ lesser than) entered by the human and number guessed by the servlet. Implement only the servlet part with the assumption of getting the human input through a form field.

11. Test the followings with a CyberTest class of Java Program for implementing security to the content of read and write file operation
   i) Create CyberOutputStream which extends from FilterOutputStream and should override a write() method to substitute the character by 3 position right to it and write the substituted character in to a file named "enc.txt" . Assume the Input of characters are from keyboard. [5]
   ii) Create CyberInputStream which extends from FilterInputStream should override a read () method to read the characters from "enc.txt" and substitute the character by 3 position left to it. Display the read such characters in console. [5]