VIT
Vellore Institute of Technology

Slot : E2+TE2

School of Computer Science Engineering and Information Systems

Fall Semester 2025-2026

Continuous Assessment Test – I

Programme Name & Branch : MCA
Course Name & code: Java Programming – PAMCA502
Class Number (s): VL2025260106034, VL2025260106029
Faculty Name (s): Prof. Senthil Murugan B, Prof. Shynu P G
Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- **Course Outcomes:**
  CO1: Apply object-oriented principles to develop Java applications
  CO2: Develop multithreaded and exception-handling features in Java programs

Q.No.	Question	Max Marks	CO	BL
1.	Define a Class Matrix with the 2D array as data member. Provide • **Default constructor** in which allocate 2 X 2 size for the integer array. • **Parameterized constructor** to receive rows and columns as arguments and allocate the size accordingly • A method named "**void initialize()**" to capture the input using Scanner class and populate the values inside the array • A method named "**Matrix doAddition (Matrix)**" to compute the addition of two different matrices and return the resultant matrix. Validate the matrices are having same dimensions, else display "**Matrices Unequal: Addition Failed**" • A method named "**void show()**" to display the output in matrix format. Define a class named '**MatrixDriver**' to instantiate two matrix objects, perform addition among them and display the resultant matrix	10	CO1	BL3
2.	Elucidate with an example the various ways to implement polymorphic behavior in java applications.	10	CO1	BL1

3.	Create a package by name "NumberPackage". Create a class by name Number with an instance variable – n (int). The class should have a parameterized constructor to initialize the value of 'n'. Create another class by name DuckNumber within the package NumberPackage. The class should inherit the class Number. The class should have a parameterized constructor that invokes the base class constructor to initialize the value of 'n' and a method isDuckNumber() that checks if the number 'n' is a duck number or not and accordingly return a boolean value. A Duck number is a positive number which has zeroes present in it. Example 3210 and 8050896 are Duck numbers. Create a main class that tests the above two classes. The main class should be defined outside the package	10	CO1	BL3
4.	ABC Hospitals maintains a console driven patient data entry system operated by front office staff. During the registration process the system captures the name, address, email id, phone number and blood group from the patient. The system validates the blood group against the following accepted values {A+VE,A-VE,B+VE,B-VE,O+VE,AB-VE,AB+VE,O-VE}. • On making valid Blood Group Entry, the system should capture the willingness to register as Blood Donor {'y' for YES and 'n' for NO}. On entering 'y', display the message "***Registered as Blood Donor. Thank you***". On entering '**n**', display '**Thank You**' • On making invalid Blood Group Entry, throw the user defined exception "**InvalidBloodGroupException**" and display the message "**You have entered wrong blood group. Enter valid data**". • The system must continue prompting the user until a valid Blood Group is provided. Design and implement this patient data entry functionality with appropriate input validation and exception handling for blood group entry.	10	CO2	BL3
5.	Write an application that reads several lines of text and prints a table indicating the number of occurrences of each different word in the text. **For example**, let the sample text be, ***To be or not to be***: the output would be "to" occurs two times, "be" occurs two times and so on.	10	CO1	BL3