Roll No. | | | | | | | | | | |

B.E (FT) END SEMESTER EXAMINATIONS – APRIL / MAY 2024

Computer Science and Engineering

VI Semester

CS6308- JAVA PROGRAMMING

(Regulation 2018 - RUSA)

Time: 3 Hours Answer ALL Questions Max. Marks 100

Course Outcomes:

CO1	Use NETBEANS or equivalent open source editors for Java programming
CO2	Create and use Java Objects for applications related to object oriented concepts
CO3	Demonstrate networked Java Applications using Java Sockets and JDBC
CO4	Implement Multithreading and create rich UI
CO5	Implement and deploy web applications using Java

BL - Bloom's Taxonomy Levels

L1- Remembering, L2 – Understanding, L3- Apply, L4 – Analyze, L5- Evaluate, L6- Create

PART-A (10 x 2 = 20 Marks)

Q.No.	Questions	CO	BL
1	List the characteristics of Java.	CO1	L1

2	Show the output of the following code:
	public class Test
	{
	public static void main(String[] args)
	{
	System.out.println("Hi, ABC, good".matches("ABC "));
	System.out.println("Hi, ABC, good".matches(".*ABC.* "));
	}
	}
		CO2	L4

3	How does a subclass invoke its superclass's constructor?	CO2	L2
4	What are the subclasses of the container class?	CO2	L1
5	What happens if the file test.dat does not exist when you attempt to compile and run the following code? public class Test {	CO2	L2

	public static void main(String[] args)
	{
	try (RandomAccessFile raf=new RandomAccessFile("test.dat", "r");){
	int i=raf.readInt( );
	}
	catch (IOException ex) {
	System.out.println ("IO Exception");
	}}}		

6	How does a thread created in Java?	CO4	L1
7	Describe the following JDBC interfaces: Driver,Connection,Statement, and ResultSet.	CO3	L1
8	Suppose the ArrayList list contains {"Dallas", "Dallas", "Hou ston", "Dallas"}. What is the list after invoking list.remove("Dallas") one time?	CO2	L2
9	Draw the lifecycle of an applet.	CO5	L1
10	What are the features of JSF?	CO5	L1

PART – B (8 x 8 = 64 marks)

(Answer any 8 questions)

Q.No.	Questions	CO	BL

11	Write the methods with the following headers:
	// Return the reversal of an integer, e.g., reverse(456) returns 654
	public static int reverse(int number)
	// Return true if number is a palindrome
	public static boolean isPalindrome(int number)
	Use the reverse method to implement isPalindrome. A number is a palindrome if its reversal is the same as itself. Write a test program that prompts the user to enter an integer and reports whether the integer is a palindrome.
		CO2	L6

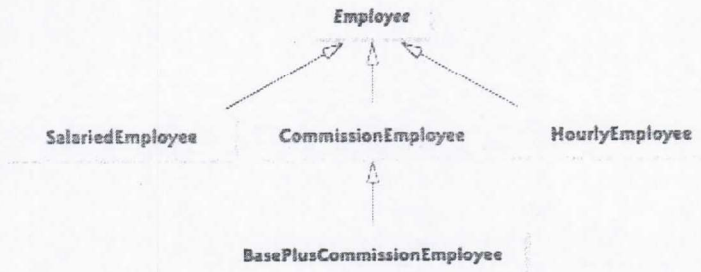
12	Suppose the weekly hours for all employees are stored in a two-dimensional array as shown below. Each row records an employee's seven-day work hours with seven columns. For example, the following array stores the work hours for eight employees. Write a program that displays employees and their total hours in decreasing order of the total hours. Su M T W Th F Sa Employee 0 2 4 3 4 5 8 8 Employee 1 7 3 4 3 3 4 4 Employee 2 3 3 4 3 3 2 2 Employee 3 9 3 4 7 3 4 1 Employee 4 3 5 4 3 6 3 8 Employee 5 3 4 4 6 3 4 4 Employee 6 3 7 4 8 3 8 4 Employee 7 6 3 5 9 2 7 9	CO2	L6
13	Let s1 be " Welcome " and s2 be " welcome ". Write the code for the following statements: • Check whether s1 is equal to s2 and assign the result to a	CO2	L6

	Boolean variable isEqual. • Check whether s1 is equal to s2, ignoring case, and assign the result to a Boolean variable isEqual. • Compare s1 with s2 and assign the result to an int variable x. • Check whether s1 has the prefix AAA and assign the result to a Boolean variable b. • Check whether s1 has the suffix AAA and assign the result to a Boolean variable b. • Assign the length of s1 to an int variable x. • Assign the first character of s1 to a char variable x. • Create a new string s3 that combines s1 with s2.		
14	Design a simple command line calculator that performs arithmetic operations. Write a program with an exception handler that deals with nonnumeric operands.	CO2	L6
15	Develop a Java program that creates a standalone GUI application that simulates an e-store which allows the user to add items (books) to a shopping cart and once all items are included, total all costs (including tax), produces an invoice, and append a transaction log file.	CO4	L6
16	Suppose that a text file contains an unspecified number of scores separated by blanks. Write a program that prompts the user to enter the file, reads the scores from the file, and displays their total and average.	CO3	L6
17	Write a JAVA program which creates two threads. One thread displays "Computer Science" for every 100 seconds and another thread displays "Anna university" for every 50 seconds, continuously.	CO4	L6
18	Build a simple client-server system (use TCP), where you use the single client to chat with a dummy server. The protocol between the client and server is as follows. • The server is first started on a known port. • The client program is started (server IP and port are provided). • The client connects to the server, and then asks the user for input. The user types his message on the terminal (e.g., "Hi", "Bye", "How are you"). The user's input is sent to the server via the connected socket. • The server reads the user's input from the client socket. If the user has typed "Bye" (without the quotes), the server must reply with "Goodbye". For any other message, the server must reply with "OK". • The client then reads the reply from the server, and checks that it is accurate (either "OK" or "Goodbye"). • If the user had typed "Bye", and the server replied with a "Goodbye" correctly, the client quits. Otherwise, the client asks the user for the next message to send to the server.	CO3	L6
19	Write a method that returns the union of two array lists of integers using the following header: public static ArrayList<Integer> union (ArrayList<Integer> list1, ArrayList<Integer> list2) For example, the addition of two array lists {2, 3, 1, 5} and {3, 4, 6} is {2, 3, 1, 5, 3, 4, 6}. Write a test program that prompts the user to enter two lists, each with five integers, and displays their union.	CO2	L6
20	Create a library database as follows: BOOK(Book_id, Title, Publisher_Name, Pub_Year) BOOK_AUTHORS(Book_id, Author_Name) PUBLISHER(Name, Address, Phone)	CO3	L6

	BOOK_COPIES(Book_id, Programme_id, No-of_Copies) BOOK_LENDING(Book_id, Programme_id, Card_No, Date_Out, Due_Date) LIBRARY_PROGRAMME(Programme_id, Programme_Name, Address) Write a program to connect to that database and extract the following data: • Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each Programme, etc. • Get the particulars of borrowers who have borrowed more than 3 books. • Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.		
21	Write a servlet program to display current date and time of server. List the steps to run the program.	CO5	L6
22	Explain the architecture of an RMI application	CO5	L2

PART – C (2 x 8 = 16marks)

Q.No.	Questions	CO	BL
23	Design a class named Account that contains: • A private int data field named id for the account (default 0). • A private double data field named balance for the account (default 0). • A private double data field named annualInterestRate that stores the current interest rate (default 0). Assume all accounts have the same interest rate. • A private Date data field named dateCreated that stores the date when the account was created. • A no-arg constructor that creates a default account. • A constructor that creates an account with the specified id and initial balance. • The accessor and mutator methods for id, balance, and annualInterestRate. • The accessor method for dateCreated. • A method named getMonthlyInterestRate() that returns the monthly interest rate. • A method named getMonthlyInterest() that returns the monthly interest. • A method named withdraw that withdraws a specified amount from the account. • A method named deposit that deposits a specified amount to the account. (Hint: The method getMonthlyInterest() is to return monthly interest, not the interest rate. Monthly interest is balance * monthlyInterestRate. monthlyInterestRate is annualInterestRate / 12. Note that annualInterestRate is a percentage, e.g., like 4.5%. You need to divide it by 100.) Write a test program that creates an Account object with an account ID of 1122, a balance of Rs.20,000, and an annual interest rate of 4.5%.	CO2	L6

	Use the withdraw method to withdraw Rs.2,500, use the deposit method to deposit Rs.3,000, and print the balance, the monthly interest, and the date when this account was created.		
24	A company pays its employees on a weekly basis. The employees are of four types: Salaried employees are paid a fixed weekly salary regardless of the number of hours worked, hourly employees are paid by the hour and receive overtime pay (i.e., 1.5 times their hourly salary rate) for all hours worked in excess of 40 hours, commission employees are paid a percentage of their sales and base-salaried commission employees receive a base salary plus a percentage of their sales. For the current pay period, the company has decided to reward base-salaried commission employees by adding 10% to their base salaries. Write an application that performs its payroll calculations.  	CO2	L6

ALL THE BEST