**Alva’s Institute of Engineering & Technology, Moodbiri**

Descriptive Assessment on Java Programming

**Date: 10/02/2024 Time: 2-4:30 PM**

**Instructions: Answer all Questions Max Marks:100**

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| 1 | Write a JAVA Program to Display all the permutations of a given data  Example 1:  Input is: 123  Output:  123  132  213  231  312  321  Example 2:  Input is : 222  Output is : There is no Permutation for this data | 10 |
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| 2 | Write a Java Program to add two numbers using the function without using addition operator +  Example:  Result of Add (110, 200) is 310  Result of Add (-10, +20) is 10  Result of Add (0, 215) is 215 | 10 |
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| 3 | Write a Java program to create a method that takes an integer as a parameter and throws an exception if the number is odd.  Example 1:  Input: Enter the Number: 19  Output: Error: 19 is odd.  Example 2:  Input: Enter the Number: 18  18 is even. | 10 |
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| 4 | Write a Java program that reads a file and throws an exception if the file is empty.  Example 1:  First Create a File “test1.txt” Assume that the content of the file (test1.txt):  abc  xyz  pqr  Output: File is not empty.  Example 2:  First Create a File “test1.txt” Assume that the content of the file (test1.txt) is nothing (blank):    Error: File is empty. | 10 |
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| 5 | Write a Java program to create a method that takes a string as input and throws an exception if the string does not contain vowels.  Example 1:  Input: AIET Mijar Moodbidri  Output: String contains vowels.  Example 2:  Input: NTDT XTP XCTCD  Output: Error: String does not contain any vowels. | 10 |
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| 6 | Write a Java program to create a class Vehicle with a method called getSpeed() and speedUp(). The method getSpeed will return the current speed of the vehicle. The method speedup will increment the current speed by 10. Create two subclasses Car and Bicycle. Override the speedUp() method in each subclass to increase the vehicle's speed differently. Write a driver program to demonstrate this.  Example:  Car initial speed: 0  Motorcycle initial speed: 0  Car speed increased by 22 units.  Motorcycle speed increased by 12 units  Car speed after speeding up: 10  Motorcycle speed after speeding up: 10 | 10 |
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| 7 | Write a Java program to create a class Employee with a method called calculateSalary(). Create two subclasses Manager and Programmer. In each subclass, override the calculateSalary() method to calculate and return the salary based on their specific roles. Assume that Manager may get the Bonus and his net salary is basic+Bonus. The Programmer may get OverTime allowance. His net salary is Basic + OverTime.  Demonstrate this using Driver Program. | 10 |
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| 8 | Write a Java program to create an interface Shape with the getArea() method. Create three classes Rectangle, Circle, and Triangle that implement the Shape interface. Implement the getArea() method for each of the three classes.  Example:  Assume that:  The sides of the Rectangle is: 10 and 12  Radius of the Circle is: 3  The base and height of the Triangle is: 4 and 6  The output:  Area of the Rectangle: 120.0  Area of the Circle: 28.274333882308138  Area of the Triangle: 12.0 | 10 |
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| 9 | Write a Java program to create an interface Sortable with a method sort() that sorts an array of integers in ascending order. Create two classes BubbleSort and SelectionSort that implement the Sortable interface and provide their own implementations of the sort() method. | 10 |
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| 10 | Write a Java program to create a base class BankAccount with methods deposit() and withdraw(). Create two subclasses SavingsAccount and CheckingAccount. Override the withdraw() method in each subclass to impose different withdrawal limits and fees.  Example:  Assume that Initial Balance of Savings Account is 2000  Withdraw Limit of Savings Bank Account is 650  Current Withdraw amount is: 300  Assume that Initial Balance of Checking Account is 1000  Overdraft Fee of Checking Account is 100  Current Withdraw amount is: 250  The Output is:  Savings Account Balance: 1700.0  Checking Account Balance: 750.0 | 10 |