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Roll No. 2294038

TCS-408

**B. TECH. (CSE)
(FOURTH SEMESTER)
MID SEMESTER
EXAMINATION, March, 2024
PROGRAMMING IN JAVA**

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) Discuss the various ways of importing any package with the help of codes. Also discuss *public static void main(String args[])* in detail. (CO1)

OR

- (b) Java is considered as high performance, architecture neutral and platform

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independent language. Justify it. Also discuss the component in detail that make java platform independent. (CO1)

2. (a) Write a program to sort characters of a given string *s*, sort it in decreasing order based on the frequency of the characters. The frequency of character is the number of times it appears in the string. Return *the sorted string*. If there are multiple answers, return *any of them*. (CO1)

Example 1 :

Input : *s* = "tree"

Output : "eert" ?

Explanation : 'e' appears twice while 'r' and 't' both appear once. So 'e' must appear before both 'r' and 't'. Therefore "eetr" is also a valid answer.

Example 2 :

Input : *s* = "cccaa"

Output : "aaaccc"

Explanation : Both 'c' and 'a' appear three times, so both "cccaaa" and "aaaccc" are valid answers.

OR

- (b) Discuss the importance of String literals with the help of examples. Also, compare StringBuffer and StringBuilder. Which of the two "StringBuilder" or "StringBuffer" is faster and why ? (CO1)

3. (a) A banking system has many customers. The details of customers are characterized by account number, customer's name, balance amount in the account, and type of account. The various functionalities are like : a method to initialize the characteristics with some default values; a method to deposit an amount into the customer's account; a method that helps to withdraw money from the account; a method to check the balance; and method to display the name, account number, and current available balance. Write Java code to demonstrate the above problem. (CO2)

OR

- (b) Discuss run time polymorphism with the help of program. How “*on interface multiple method*” form of polymorphism can be achieved ? Explain. (CO2)
4. (a) Explain super, this, final and finalize() with the help of codes. (CO2)

OR

- (b) Define packages in Java. Write a program to create a package *package1* having class *MyClass1* and interface *MyInterface1*. The *MyClass1* has method *int divide (int, int)* to divide two numbers and another method *int sum (int, int)* to add two numbers. Reuse the methods of *MyClass1* in another class *MyClass2* that is placed in some another package *package2*. Note that, *package2* is not the sub package of *package1*. (CO2)
5. (a) An election is contested by 5 candidates. The candidates are numbered 1 to 5 and voting is done by marking the candidate number on the ballot paper. Write a

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program to read the ballots and count the votes cast for candidate using an array count. In case a number read is outside the range 1 to 5, the ballot should be considered as 'NOTA' and the program should also count the number of NOTA ballots.

(CO1/CO2)

OR

- (b) Discuss the access scope of public, protected, default and private access specifiers with suitable examples.

(CO1/CO2)