and further B is the super class of Class C. Class A and Class C contain only a default constructor and class B contains only a single parameterized constructor.

When an object of Class C would be created in the main method of a public class SampleProgram, explain why the code would throw a compile time error. Fix the code by adding some code to it and explaining the flow. (CO1, CO2)

5. (a) What is Interface and how interfaces class in Java ? Explain with a program how interfaces can help in implementing multiple inheriance in Java. (CO1, CO2)

OR

(b) Define a java class 'Clock' that has the following members described as below : (CO1, CO2)

Private data members : hour, min, sec.

Parameterized method accept() : To accept values for hour, min and sec.

method convert() : To convert the time entered in hour, min and sec to seconds.

method showResult() : To display the result.

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H Roll No. 2194026

TCS–408

B. TECH. (CSE)
(FOURTH SEMESTER)
MID SEMESTER
EXAMINATION, April, 2023

JAVA PROGRAMMING LANGUAGE

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 architecture of JVM in detail with the help of a neat and clean diagram. (CO1)

OR

(b) Write a Java program that allows the user to enter the names of five candidates in a local election and the number of votes received by each candidate. (CO1)

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The program should then produce the following output :

(i) Each candidate's name, the number of votes received.

(ii) The percentage of the total votes received by each candidate and

(iii) Shows the winner of the election.

A sample output is :

Candidate	Votes Received	Percentage of Total Votes
Raj	5000	25.90
Priya	4000	20.73
Kamal	6000	31.09
Ravi	2500	12.95
Richa	1800	9.32
Total	19300	

The winner of election is Kamal !

2. (a) Write a program that counts the total number of objects created. Also use a show( ) instance method to display the result. (CO1)

OR

(b) Discuss dynamic method dispatch. Also write a code to demonstrate it. (CO1)

3. (a) Discuss final and finalize. Write a code to demonstrate the garbage collection of unreferenced objects. (CO1, CO2)

OR

(b) Write a program to input a string from user and rewrite it into alphabetical order. For example the word PROGRAM can be rewritten as AGMOPRR. (CO1, CO2)

4. (a) Write a Java program which contains an abstract class and has a constructor which prints "This is constructor of abstract class", an abstract method named 'a method' and a non-abstract method which prints "This is a normal method of abstract class". A class 'Subclass' inherits the abstract class and has a method named 'a method' which prints "This is an abstract method". Now create an object of 'Subclass' and call the abstract method and the non-abstract method. (CO1, CO2)

OR

(b) Explain about the constructor execution hierarchy in inheritance. Consider a case when Class A is the super class of Class B