BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO/SP20)**

CLASS: MCA **SEMESTER : I**
BRANCH: MCA **SESSION : MO/2022**

SUBJECT: CA409 OBJECT ORIENTED DESIGN USING JAVA

TIME: 03 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

Q.1(a)	Provide the syntax for two different kinds of "for loops" that can be written in JAVA. You can assume a JDK version greater than 1.6	[2]
Q.1(b)	Write a program to check whether a number is a PERFECT number. A perfect number is equal to the sum of all its divisors except itself.	[3]
Q.1(c)	Explain how a JAVA program is compiled and deployed, clearly specifying the role of the bytecode and JVM.	[5]
Q.2(a)	Suggest two ways to deal with a checked exception.	[2]
Q.2(b)	What is the fundamental difference between assigning a value to a primitive variable and referring to an object using a reference variable?	[3]
Q.2(c)	Create an array containing the names "Sachin", "Sourav", "Rahul", "Anil" and "Virendra" in the given order. Sort the array using any algorithm of your choice.	**[5]**
Q.3(a)	What do you understand by function overloading?	[2]
Q.3(b)	Write a class to represent a quadratic equation. The private members of the class are "a", "b" and "c" which represents the coefficients in an equation of the form ax^2+bx+c=0, a<>0. Write the required set of constructors, getters and setters. Also write the following methods in the class: public double getFirstRoot() public double getSecondRoot() public Boolean noRootsExist() public double getDeterminant() public double getSumOfRoots() public double getProductOfRoots()	[3]
Q.3(c)	Explain how a package name translates to a physical path on a machine. In this context what is a CLASSPATH.	[5]
Q.4(a)	What are some of the methods available in the Object class?	[2]
Q.4(b)	Create an interface called IEqual, containing a single method called equals() which returns a Boolean. Implement the interface in a class called StudentMarks, which contains the name, rollno and mark in a single subject for a student.	[3]
Q.4(c)	Create a class called Employee, containing String variables "firstName" and "lastName" and suitable constructors, getters and setters. Create a class SalesEmployee, which derives from Employee. All SalesEmployees are supposed to have a Unique ID. Write a method in SalesEmployees called "getEmployeeDetails", which should return the abbreviated name of the Employee and his/her unique Id as shown James Walker, 10086 – J. Walker [10086] Marie Gomes, 10056 – M. Gomes [10057]	[5]
Q.5(a)	What happens when a Scanner object expects to read an Integer but is supplied with a string.	[2]
Q.5(b)	How would you serialize an object to a secondary storage?	[3]
Q.5(c)	Write a program that sequentially reads lines from a text file and prints them to the console in uppercase.	[5]

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