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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

April 2024 Semester End Main Examinations

Programme: B.E. **Semester: III**
Branch: Computer Science Engineering (Data Science) **Duration: 3 hrs.**
Course Code: 23DS3PCOOJ **Max Marks: 100**
Course: Object Oriented Programming with Java

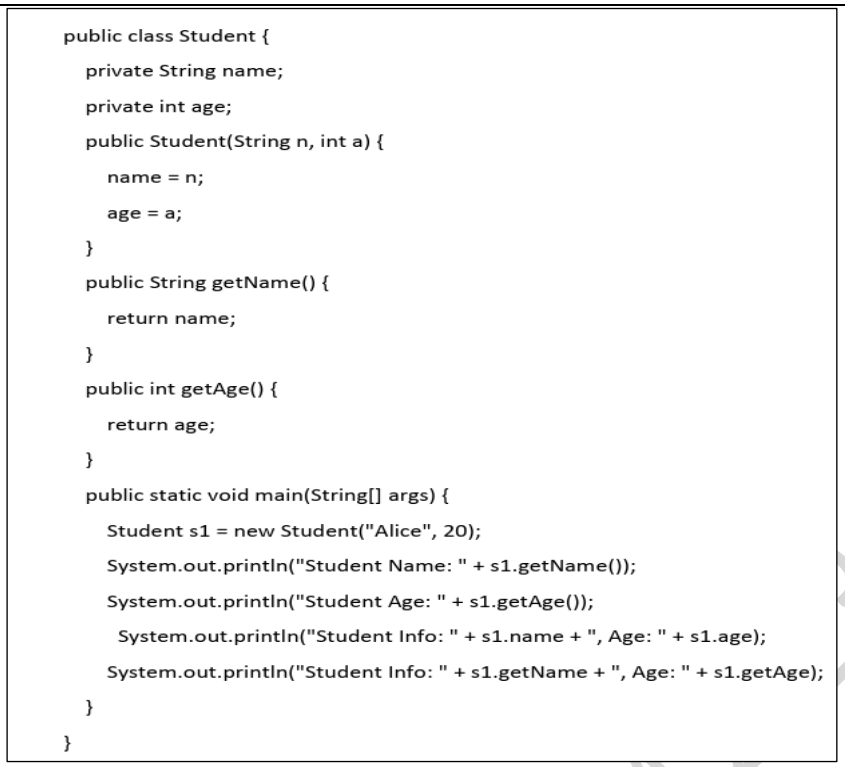
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Can a class be both abstract and final, justify with an example.	CO1	PO1	6
	b)	Create a subclass called "Car" that is derived from the super class "Vehicle". Assume suitable member variables and methods for both the classes. Illustrate with a java program that the subclass object can access members of the superclass.	CO3	PO3	8

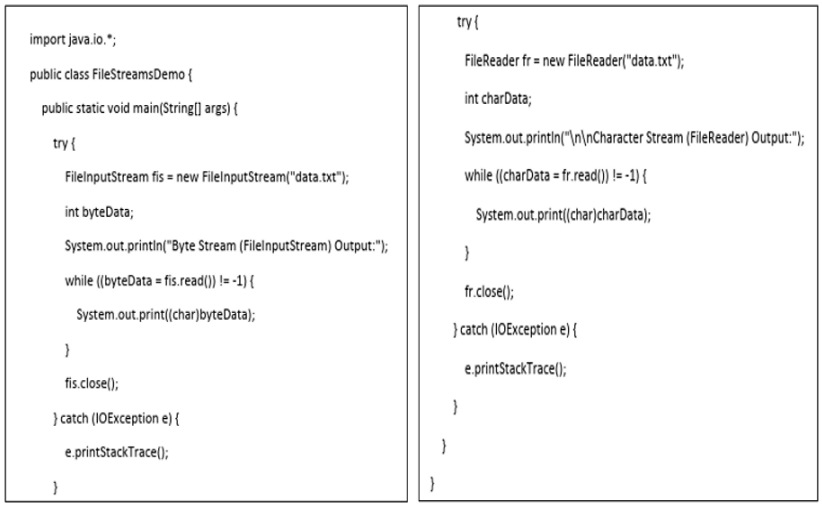
	c)	Analyze the erroneous program given below. Identify the errors. Write the corrected program.
		class Emp{
		int eno; static int count;
		Emp( ){count++;}
		void seteno(int no){ eno = no;}
		static void display( )
		{System.out.println("Emp no:"+eno);
		System.out.println("Emp objects created till now:" +count); } }
		
		public class MainClass
		{ public static void main(String args[])
		{ Emp[] employees = new Emp(10);
		for(int i=0; i<employees.length; i++)
		{ employees.seteno(i+1);employees.display( );}
		} }
			CO2	PO2	6

		UNIT - II			
2	a)	Tabulate the various levels of access protection available for packages and their implications. Create two packages and demonstrate the various levels of access protections with appropriate program	CO1	PO1	7
	b)	Consider the following Java program. Identify and explain the errors in the code. Write the correct program for the same.	CO2	PO2	7

						
		c)	Write a java program demonstrating packages with the scenario given below consider member method message () from class First in package1. Illustrate that the member method message () can also be accessed outside of package1.	***CO3***	***PO3***	**6**
			OR			
	3	a)	Create two user defined package mybank and mycustomer. Package mybank contains a class Customer and a method balance and package mycustomer contains a class MyProfile and a method display. Demonstrate simple java application program that make use of classes provided by these two packages using an import statement.	***CO3***	***PO3***	**7**

		b)	Analyze the erroneous program given below. Identify the errors, list and discuss. Write the corrected program.
			interface Inter1
			{int x=200,y=300;
			void input(int x1,int y1); void display( ); }
			class Demo implements Inter1
			{int a,b;
			Demo(int x1,int y1){
			a=x1;b=y1;x=a;y=b;}
			public void display( ){
			System.out.println(a+" "+b+" "+x+" "+y);}
			}
			class Interface1 {
			public static void main(String s[]) {
			Demo d=new Demo(100,200);
			d.display( ); } }
				CO2	***PO2***	**7**

		c)	Apply the concept of inheritance in interfaces and demonstrate the same using an example program.	***CO1***	***PO1***	**6**

			UNIT - III			
	4	a)	Illustrate nested try statement with an example program.	***CO1***	***PO1***	**6**
		b)	Create a class STUDENT which includes members usn, name, marks in 3 subjects. Accept the input through command line arguments. Raise an user defined exception 'noarg' if no arguments are given in command line. Also raise an exception when negative marks are given.	***CO3***	***PO3***	**6**
		c)	Write a Java program which creates two threads, one thread displaying "BMS College of Engineering" once for every ten seconds and another displaying "CSE - DataScience" once for every 3 seconds.	***CO2***	***PO2***	**8**
			UNIT - IV			
	5	a)	Write a program to copy the content of File1.txt to another file File2.txt. by reading the file name as command line arguments.	***CO2***	***PO2***	**6**
		b)	Write java snippet code using string methods for following operations i) Replace all occurrences of "Edureka" to "Brainforce". Therefore, the output would be "Hey, welcome to Brainforce". ii) Compares the two strings(Str1=DATA SCIENCE , Str2=data science) on the basis of content of the string. iii) Checks if string Str1 end with the suffix - SCIENCE.	***CO3***	***PO3***	**6**
		c)	Consider the following Java code snippet that reads data from a file using both byte stream and character stream classes.  a) Explain the difference between byte stream and character stream classes used in the given code. b) Discuss why FileReader is preferred over FileInputStream when dealing with text files. c) How would you modify the code to handle the scenario where "data.txt" does not exist? d) Explain the importance of closing the streams (fis and fr) in the provided code.	***CO3***	***PO3***	**8**

```
import java.io.*;
public class FileStreamsDemo {
  public static void main(String[] args) {
    try {
      FileInputStream fis = new FileInputStream("data.txt");
      int byteData;
      System.out.println("Byte Stream (FileInputStream) Output:");
      while ((byteData = fis.read()) != -1) {
        System.out.print((char)byteData);
      }
      fis.close();
    } catch (IOException e) {
      e.printStackTrace();
    }
    try {
      FileReader fr = new FileReader("data.txt");
      int charData;
      System.out.println("\n\nCharacter Stream (FileReader) Output:");
      while ((charData = fr.read()) != -1) {
        System.out.print((char)charData);
      }
      fr.close();
    } catch (IOException e) {
      e.printStackTrace();
    }
  }
}
```

			UNIT - V			
	6	a)	Explain Generics. Demonstrate generics with two parameters with an example program.	***CO1***	***PO1***	**6**
		b)	Compare ArrayList and LinkedList regarding their data structure, performance, and preferred usage scenarios, focusing on insertion, deletion, and element access operations.	***CO1***	***PO1***	**7**
		c)	Write a note on HashSet with appropriate Java program	***CO3***	***PO3***	**7**
			OR			
	7	a)	Illustrate with an example how Autoboxing/Unboxing occurs in expressions with an example program	***CO1***	***PO1***	**6**
		b)	Explain ArrayDequeue class. Write Java program to demonstrate the ArrayDeque class in Java having following operations in the same order 1.Insert 10,20,30,40,50 and display the dequeue 2.empty the dequeue 3. Insert the element at the head 4. Insert the element at the tail and display the dequeue Write the output for the same	***CO3***	***PO3***	**7**
		c)	Compare type wrappers with primitive types in Java, discussing advantages and disadvantages in terms of memory usage, performance, and functionality.	***CO1***	***PO1***	**7**

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