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

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E **Semester: IV**
Branch: Information Science and Engineering **Duration: 3 hrs.**
Course Code: 19IS4PCJAV **Max Marks: 100**
Course: Java Programming **Date: 25.09.2023**

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

UNIT - I

1 a) Write a program in Java to create a class Cube which contains three data members for holding width, height and length of a Cube and two methods Area() and Volume( ) to calculate and return the area and volume of Cube. Create another class named CubeDemo which creates object of Cube class and (i) Demonstrate the use constructors. (ii) Compute the volume and area of Cube. **08**

b) Illustrate Dynamic dispatch method with an example. **06**

c) Predict the output of the following. Give justification to your answer. **06**

i)
```
class Base {
  final public void show() {
    System.out.println("Base::show() called");
  }
}
 class Derived extends Base {
  public void show() {
    System.out.println("Derived::show() called");
  }
}

class Main {
  public static void main(String[] args) {
     Base b = new Derived();
     b.show();
  }
}
```

ii)
```
class Test {
public static void swap(Integer i, Integer j) {
    Integer temp = new Integer(i);
    i = j;
    j = temp;
```

```
  }
  public static void main(String[] args) {
    Integer i = new Integer(10);
    Integer j = new Integer(20);
    swap(i, j);
    System.out.println("i = " + i + ", j = " + j);
  }
}
```

UNIT - II

2	a)	Create a package named mypack1 containing a class AreaCube in which a method Area() computes area of a cube and returns area. Import this package in another package mypack2 which contains a class cube. The cube class invokes the Area() method and displays the area of the cube. Member variables can be considered as per the program requirements.	**06**
	b)	Write an interactive program to compute the square root of a number. The input values must be tested for validity. If it is negative, the user-defined method Mysqrt( ) should raise an exception.	**06**
	c)	Consider an example of declaring the examination result. Design three classes: Student, Exam and result. The student class has data members: roll number, name age and marks of three subjects. Create the class Exam by inheriting student class. The exam class has its own method total_marks() that computes total marks of the student. The result class inherits exams class and includes a method that declares the grade depending on the total marks. Develop a program to model this relationship.	**08**

UNIT - III

3	a)	Illustrate autoboxing and unboxing with Integer, Boolean and Double types.	**06**
	b)	Develop a Java program that writes a message to a file and also reads the contents of the file and display the same on the console by handling FileNotFoundException and IOException.	**06**
	c)	Write a program to create two threads the first thread generates prime numbers from 1 to 100. The Second thread computes sum of all the elements of an array. Ensure the main thread terminates last.	**08**

UNIT - IV

4	a)	Develop a program to implement a generic stack.	**08**
	b)	Illustrate with an example program to pass multiple Type parameters in Generic classes.	**06**
	c)	Illustrate with an example showing how generics improve type safety?	**06**

OR

5	a)	Develop a Java program to extract ‘m’ characters from a given string from nth position. Given string = “Java Programming is fun”, m=4 characters and n = 0. Also compare sting buffer and string class.	**08**

b) Demonstrate the following methods provided by String Class with suitable examples. **06**

i) indexOf()
ii) LastlndexOf()
iii) Concat()

c) Write an appropriate Java code to input three strings s1, s2 and s3 than and compare string s1 with s2 and s1 with s3 for i) Equal strings and also using compareTo function. ii) Compare given region of string s1 with string s2, demonstrate the difference between equals and ==. **06**

UNIT - V

6 a) Create an object of Array List class and perform the following operations: **06**

i) Print the initial size of the arraylist.
ii) Add 5 items to the list and Print the list
iii) Change the item 2 and 3 and then print the list
iv) Remove items 1 and 2 and then print the list

b) Create a class student with two private members ID and Name. Write a program to add atleast three objects of student class to the linked list and display the same. **06**

c) Write a program that illustrates the use of add(), clear() and size() methods of Hashset class in Java. **08**

OR

7 a) Explain Components and Containers in Swings. **06**

b) Write a program to illustrate Custom comparator in Treeset. **06**

c) Develop a student registration form for an event organized by ISE department as a part of Phase Shift using swings. The Student registration form should contain Student Name, USN, Age,Gender, E-mail, Phone-No. and the Event name. **08**

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