



**Answer ALL Questions**  
**(10 X 10 = 100 Marks)**

1. Give your arguments for the following statements with an example program:

- a) An abstract class can extend from an abstract class [2]
- b) Interface can have constructors [2]
- c) Instance variable declared in the interface can be assigned some value by the implementing class [2]
- d) The class implementing the interface must give the abstract method as private access modifier. [2]
- e) Super keyword can be used to override the methods declared in one interface to be extended in another interface. [2]

2. Write a case sensitive Java program that reads a sentence from console (the characters of the sentence may be capital or small or mixed) and two positive integers. Output the same sentence after replacing those words present at those given integer places by the next character in a circular fashion according to the English Alphabets. [10]

EX. 1: Case 1: Where the input integers are different

Input Sentence: He has good Books.

Input Integers: 2, 4

Output Sentence: He ibt good Cpplt.

(i.e. word number 2 and 4 have been replaced by the next characters in a circular fashion)

EX. 2: Case 2: If both the integers are same then replace only one word

Input Sentence: Time and tide waits for none.

Input Integers: 3, 3

Output Sentence: Time and ujef waits for none.

- 3. a) Write a Java program to accepts a file name as command line argument and find the length of the longest word in the file and display an error message if the file does not exist. [6]
- b) "Java does not support operator over loading" - Support this statement with appropriate reasoning. [4]
- 4. a) Write a class to sort the given set of n integers in descending order. Include a try block to locate the array index out of bound exception and catch it. Also identify the duplicate elements, if found create user-defined exception as "Redundancy occurs" and eliminate the redundancy. [7]
- b) Write a Java program to produce maximum number of meaningful words from the given word. [3]  
Ex: education --> one, on, ton, eat etc.
- 5. a) What is the output of the following program? [5]

```
public class Test implements Runnable
{
    public void run()
    {
        System.out.printf("%d",3);
    }
    public static void main(String[] args) throws InterruptedException
    {
        Thread thread = new Thread(new Test());
    }
}
```



```

        thread.start();
        System.out.printf("%d",1);
        thread.join();
        System.out.printf("%d",2);
    }
}

```

b) What is the output of the following program?

[5]

```

class Base
{
    public static String s = " Super Class ";
    public Base()
    {
        System.out.printf("1");
    }
}
public class Derived extends Base
{
    public Derived()
    {
        System.out.printf("2");
        super();
    }

    public static void main(String[] args)
    {
        Derived obj = new Derived();
        System.out.printf(s);
    }
}

```

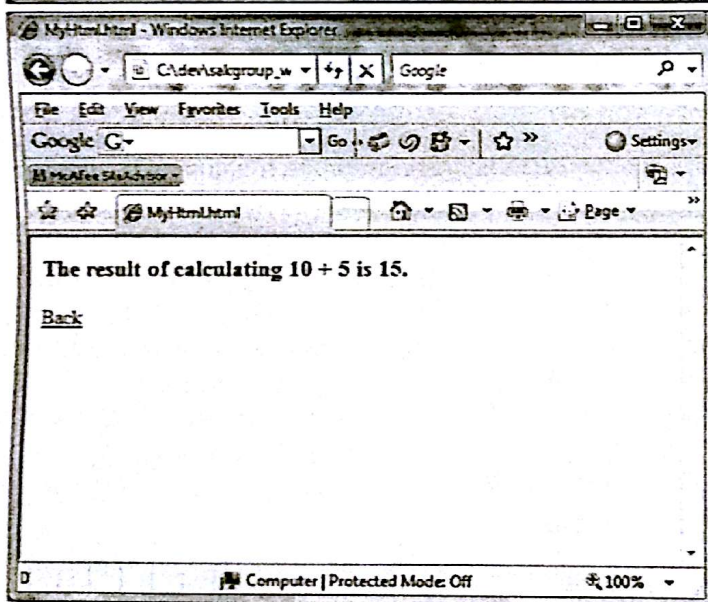
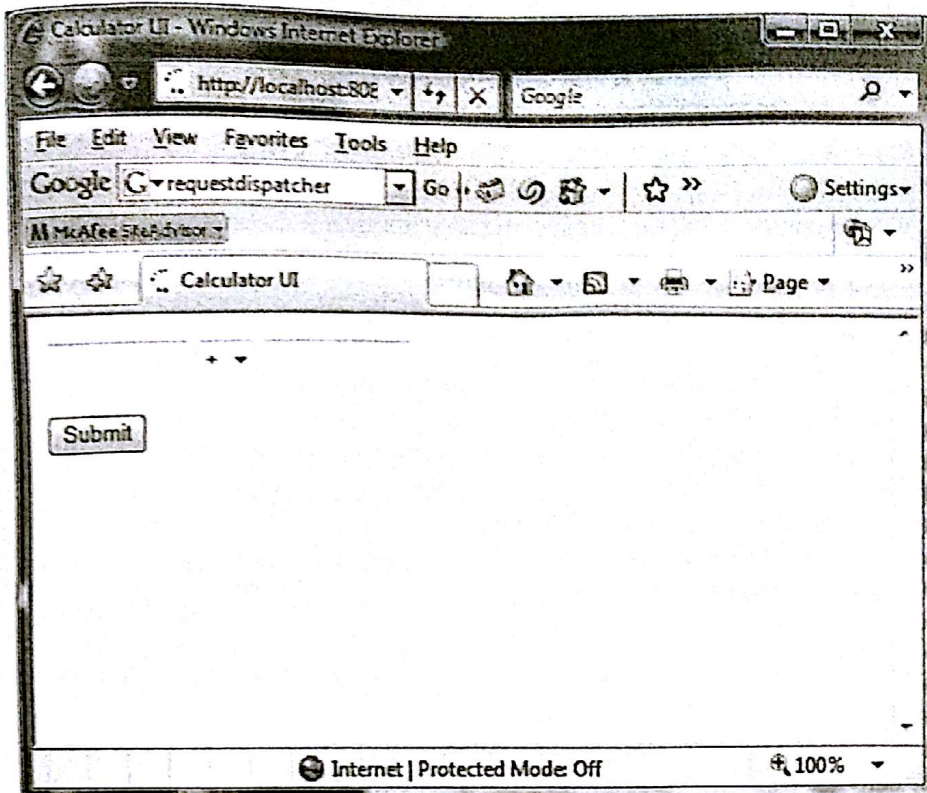
6. Write a Web application to perform simple calculation

[10]

The application requires these files

- ✓ calculatorUI.html - to contain the user input form for the application.
- result.jsp - to display the result of the calculation.
- CalculatorBean.java - Java bean used by result.jsp to obtain the calculated result.
- ✓ CalculatorServlet.java - to initialize CalculatorBean and forward the request.
- web.xml - deployment descriptor for the servlet.





7. The XYZ store has developed the following data entry screen for its operations. The store offers 3 different types of membership discount schemes for its regular customers. Platinum members get a discount of 10% on all their purchases, Gold members get 5% and Silver members get 3% discount. The Regular customer gets an additional discount of 2% more. [10]

PRODUCT	<input type="text"/>	Premium Membership
QUANTITY	<input type="text"/>	<input type="radio"/> PLATINUM 10%
RATE	<input type="text"/>	<input type="radio"/> GOLD 5%
AMOUNT	<input type="text"/>	<input type="radio"/> SILVER 3%
DISCOUNT	<input type="text"/>	<input type="radio"/> Regular 2%
NET AMOUNT(Rs.)	<input type="text"/>	
		<input type="button" value="CALCULATE"/> <input type="button" value="EXIT"/>



Write the Java code to add the following functionalities:-

- i. To remove the decimal part from the text field NET AMOUNT so that the net amount contains only the integer portion in rupees.
- ii. The GOLD radio button should be selected by default when the form is opened. Also write the appropriate event.
- iii. To calculate amount, discount and net amount as per the descriptions and conditions. The formulas are as follows:-  
Amount = quantity \* rate  
Net Amount = Amount – Discount
- iv. Write the code for Exit to close the application, but before the application is closed it should check the net amount and if the net amount > 10,000 the membership of the customer should be upgraded to the next higher level and a message box informing the customer should be displayed. For example if the customer already has Silver membership it should be upgraded to Gold and he should be informed of the same using a dialog box.
- v. Create a database to store the product name, quantity, rate, amount, discount, net amount for a period of one year. Create a report to display which product was the best selling product, on which month of the year.

8. Create a class called array inside a package called "algorithm" with a method called to\_get() to get the 'n' array elements from the user. Create another package called "manipulation" inside package "algorithm" and define two classes called "sort" and "search". In the "sort" class include a method to sort the elements of the array by taking the array values from the method to\_get() as array object. In the "search" class include a method to find and check whether the element is present or not by taking the input element from the user. If the array element present, display it with the position of the element in the array else display an error message. Now define the main() inside another package called Pack1 which is the sub-package of manipulation. The main method should find whether any duplicate elements present in the given set of elements from the user. Otherwise the duplication has to be removed before sorting or searching the array [10]

9. A bank account was created by a father for his son studying in hostel. So, father and his son will operate the bank account. The bank has instructed to open the account with minimum Rs.1,000 as its account balance. If the amount deposited is less than Rs.1,000, create an exception to deposit Rs.1,000 to open the account. The father deposits random amount between Rs.1,000 to Rs.2,000 as per his convenience until the account balance crosses Rs.5,000. The son can start withdrawing the amount only if the balance exceeds Rs.5,000. Thereafter, the son withdraws random amount between Rs.500 and Rs.1,000, until the balance goes below Rs.1,000. Once the balance becomes less than Rs.1,000, an intimation should reach father to deposit the amount till it crosses Rs.5,000 and the process continues. Write a father and son thread to carry out the above process. [10]

10. Imagine 10 children are playing shuffling game. The game contains 10 bit of papers in which every paper contains number from 1 to 10. The papers are folded in it is thrown on the floor by the friends on a turn basis, and every children are allowed to take only one piece of paper for a time. The game was repeated for 'n' times, every time the number received by the children to be recorded, to announce the winner of the game for every shuffling. List out the consolidate numbers received by every children after 'n' time of shuffling. Write Java program for the above scenario and display the result using Collection framework in java. [10]

