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Your Roll No .. ..

6175

B.Sc. (Hons.) Computer Science / I Sem. J

Paper – 101 : Programming Fundamentals

(Admissions of 2001 and onwards)

Time : 3 Hours **Maximum Marks : 75**

(Write your Roll No on the top immediately on receipt of this question paper)

Attempt **all** questions

Parts of a question must be answered together.

1 (a) Use parenthesis in the following expressions : 3

(i) a = b = ++d + 2

(ii) i = j % short k

(iii) y = a | b ^ c

(iv) x = ++y;

(v) a < y && b | c

(vi) a | b && c | d

(b) Fill in the blanks : 4

(i) The name of the constructor is always the same as the name of the _____

(ii) Each object of the class has its own set of _____

(iii) A string of length zero is called an empty string and written as _____

(iv) The character _____ is used as escape character in Java

(v) The _____ block will execute whether or not an exception is thrown

(vi) Methods declared as _____ cannot be overridden

(vii) A _____ block is executed even before the main method

(viii) To prevent a class to be accessed outside the package _____ access is used.

(c) State True or False. Justify your answer
Note : No marks will be given if there is no justification 4

(i) Try can not be used without a catch block

(ii) Abstract classes do not have any constructor.

(iii) An interface is a collection of constants and abstract methods.

(iv) Same name can be used for a member function in a derived class as it is in the base class

(d) Rewrite the following do-while loop using a for loop 4

```
int n = 1,
double x = 0, s,
do
  {
    s= 1 0 / (n*n);
    x = x + s,
    n++;
  } while(s > 0 01),
```

2 (a) Given the following variable declarations and expressions If the expression is illegal, then explain why it is illegal otherwise give the data type of expression obtained after evaluating the expression 4

int i, short s, float f, double d, Boolean b, String t;

(i) i = f < d

(ii) d = 2

(iii) i = (short) f

(iv) b + i + t

(b) Write a program segment which will ask the user to enter his/her name which is of type String. This name of the user is matched with two user names say name1 and name2 (already available in the program and both of type String) The program segment should continue asking user to enter his/her name until the user correctly enters it If the name matches, then the program segment should print "WELCOME" followed by the correct name of the user 3

(c) Design a class Square having *length* as its instance variable Define a constructor and a method 'area' to display area of the rectangle. Extend this class and add *breadth* as an instance variable to form Rectangle class For Rectangle also, define a constructor and a method 'area' to display area of the rectangle. Write main method to show dynamic method dispatch 8

3 (a) Consider the following code segment .

```
public class triangle
{
        public double side1, side2, side3;
        public triangle(double s1, double s2,
                                double s3) {    .}
}
```

(i) Complete the above constructor 1

(ii) Write a method for the class triangle called getTypeofTriangle() which prints whether the triangle is equilateral, isosceles or scalene based on the length of its side. 2

(iii) Write a method area() which will return the area of triangle with side1, side2 and side3. 2

(iv) Write a main method which will create an instance of the triangle class and call both the methods and prints the appropriate answer. 2

(b) Write the output of the following code Also justify your answer 4

```
class A{
        int i,
        A( ){
          System.out.println("In class A" +
                                "i = "+i),
        }
        A(int x){
          i = x + 10,
          System.out.println("In class A " + "
                        i = " + i);
        }
```

```
}
class B extends A{
        int j,
        B( ){
           super( ),
           j = 100,
           System out.println("In class B" + "
                                  j = " + j),
        }
        B(int x, int y){
           super( x + y),
           System out println("In class B" + "
                                  j = "+ j),
        }
}
class Demo
{
        public static void main(String args[])
        {
           B b = new B(10,20),
        }
}
```

(c) List all the exceptions that can be thrown by the following code segment 4

```
class Excep
{
        public static void main(String args[])
        {
          try
          {
             int n = Integer parseInt (args[0]);
             int n1 = Integer parseInt(args[1]),
             int n2 = n+n1,
             System out println("Sum is " + n2),
          }
          catch (ArithmeticException e)
```

```
            { System out println("Arithmetic
              Exception" + e),}
        catch (NumberFormatException e)
            { System out.println("Number
              FormatException" + e),}
        catch (Exception e)
            { System.out.println("Exception"
              + e), }
    }
}
```

If the following command is used to run this class, which exception will be actually thrown ?

```
java Excep 12  13  a
```

4 (a) Write a program in Java to find the third largest element of an array. **5**

(b) Assume that we have the following code in a file \abc\def\Q.java

```
package def,
public class Q {
  int var;
}
```

and the following code is in the file \abc\Tester.java

```
import def Q;
public class Tester {
  Q q = new Q();
  public void someMethod( ) {
     q var = 1;
  }
}
```

What would be the error message if you try to compile this file and why ? Also give two ways to eliminate this error. **5**

(c) Write a recursive method in Java to find the sum of n numbers of an integer array **5**

5 (a) Consider the following overloaded method declarations 3

void add(int i, double f)

int add(float d, int i)

double add(double d1, double d2)

Which method will be invoked for the following calls ? Also, explain if any call generates an error ? Justify your answer.

(i) add(3, 4)

(ii) add(3 5, 4.5)

(b) Implement a class Employee. An employee has a name and salary Provide a constructor with two parameters 1

Also add the following functions to the Employee class :

public String getName( ), 1

public double getSalary( ), 1

public void raiseSalary (double byPercent) , 2

These methods return name and salary and raise the employee's salary by certain percent. Write the main method to create an instance of this class and invoke all its member methods 2

(c) Write a program to count the number of characters in a file. Accept the name of the file as command line argument 5
