

This question paper contains 4+2 printed pages]

Your Roll No.

1970

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

Paper 101 : Programming Fundamentals

(Admissions of 2001 to 2010)

Time : 3 Hours

Maximum Marks : 75

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

The question paper consists of *two* parts—Part I and Part II..

Part I is compulsory.

Attempt any *four* questions from Part II.

Part I

1. (i) What is bytecode and what are its advantages ? 3
- (ii) What is garbage collection in Java ? When is it carried out by the system ? 3

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- (iii) Compare process oriented and object oriented programming models. 4
- (iv) What are the various uses of super keyword ? Explain with the help of examples. 4
- (v) What are constructors ? How are they different from other methods of the class ? 4
- (vi) What are packages ? Explain how are they created. 4
- (vii) What is exception handling and how is it carried out in Java ? 4
- (viii) Differentiate between the following : 3×3
- (a) compile time and run time polymorphism
 - (b) method overloading and method overriding
 - (c) classes and an interfaces.

Part II

2. (i) Explain the *three* uses of final keyword. 6
- (ii) Identify and correct the errors in the following code segments. 2×2
- (a) `switch(c) {`
- `case 'a' : aNo++;`
- `case 'e' : eNo++;`
- `default : iouNo-+;`
- `}`
- (b) `int j;`
- `float f=10`
- `j = f;`
- `System.out.println("j = " + j + "f = " + f);`
3. (i) Write a program to copy one file to another file. 5
- (ii) Write a program in Java to read n elements and display the position of the largest element in the array. 5

4. (i) Create a class TwoDim which contains x and y coordinates as int. Define the default constructor, parameterized constructor and void print() to print the co-ordinates. Now reuse this class in ThreeDim adding a new dimension as z of type int. Define the constructors for the subclass and override the method void print() in the subclass. Implement main() to show dynamic method dispatch. 6

(ii) What is the output of the following code segments ? 2×2

(a) `Public static void main (String args[]){`

`int a, b, c;`

`a = b = c = 1;`

`if (c == 1 & b ++ < 6),`

`a = 5;`

`System.out.println(a + " " + b + "" + c);`

`}`

(b) String a = new String ("try"), b = "try";

if (a.equals(b))

System.out.println("a.equals(b) is true");

else

System.out.println("a.equals(b) is false");

if (a == b)

System.out.println("a == b");

else

System.out.println("a != b");

5. (i) Write a program in Java to find the sum of the following series : 4

$$S = 1^1 + 2^2 + \dots + n^n.$$

- (ii) Explain the difference between the following shift operators <<, >> and >>>. 6

6. (i) Design a class employee using Java. An employee has a name and salary. Write the default constructor, a constructor with two parameters (name and salary) and methods to return name and salary. Also write a method raiseSalary that raises the employee's salary by a certain percentage. Derive a subclass Manager from employee. Add an instance variable named department to manager class. 6
- (ii) Write a recursive method to display the numbers of an integer array in reverse order. 4