7264

M.Sc. Operational Research / Sem. II   J

Paper 205— Java Programming

(N.S.: Admissions of 2009 and onwards)

Time : 3 hours

Maximum Marks : 50

(Write your Roll No on the top immediately

on receipt of this question paper)

Attempt any five questions.

1. (a) Explain the feature of Java code related to *"Write Once, Run Anywhere"*.

(2)

(b) Explain how JVM translates source code What is Byte code? What are its advantages and disadvantages?

(2)

(c) Given the following declarations

double x = 2 5,
double y = -1 5;
int m = 16;
int n = 4;
String s = "silly",
String t = "thing";

What is the value of each of the following expressions?

i) $x + n * y - (x + n) * y$
ii)   Math sqrt(Math.sqrt(m))
iii)   (int) Math round(x)
iv) $1 - (1 - (1 - (1 - n)))$
v) $s + t$
vi)   s.length() + t.length()

(2)

(d) Give four features of programming such as C, C++ that have been removed from Java language. What features of Java provide their equivalents?

(4)

2. (a) Write short note on the primitive data types supported by Java.

(2)

(b) Write a program which will accept any number of command line arguments when it is executed. If there is at least one command line argument, the program will display a message that says which of the arguments is the longest string. If there are no command line arguments, it will display a message that says there are none. For example, suppose the program consists of a class called Longest, and is executed using the command line

java Longest cat dog badger fox

Then the following message will be displayed.

The longest argument is badger

(3)

(c) What is a String class in java? Explain briefly the working of various string manipulation methods in String class. How does String class differ from the StringBuffer class?

(4)

(d) Write a while statement that is equivalent to the following for statement.

```
for (int i = 0; i < n; i++)
t = t + a[i];
```

(1)

3. (a) Write a note on looping structures in JAVA.

(2)

(b) Write the switch equivalent of the following code.

```
class UsingIfelseif{
    public static void main(String[] args) {
        int month=4;
        String season;
        if (month==12||month==1||month==2) season= "Winter";
        else if (month==3||month==4||month==5) season= "Spring";
        else if (month==6||month==7||month==8) season= "Summer";
        else if (month==9||month==10||month==11) season=
"Autumn";
        else season= "Bogus month"
        System.out.println("April is in the "+season+ ". ");
    }
}
```

(2)

(c) Write a java program which defines a class called **Square**, with private field member width. Define a parameter and a default constructor that initializes the field value to 0 Define two methods, one to read the field from the console input and other to calculate and display the area of the rectangle. Define another class Rectangle that extends the class Square with private data member height. Define same set of constructors, which also initializes the superclass fields calling superclass constructors. Define methods same as for square class. In the main method create objects of both the classes, read the necessary information from the user and calculate and display the area of a square and a rectangle.

(4)

(d) A variable in a class can be declared with one of the "access modifiers" *public*, *private*, or *protected*, or it can be declared with no access modifier at all. Discuss the effect of each of these four possibilities.

(2)

4. (a) Write a program that will ask the user to enter two numbers. Then it will ask him to enter the product of the numbers. If he enters the correct answer it will say "Correct!". If he inputs the wrong answer it will keep asking him to try again until he gets the answer right. If at any stage he enters the words "give up", it will tell him the correct answer. Here are two examples of what might appear on the screen

(i)	Enter a number 143	(ii)	Enter a number: 137
	Enter another number 72		Enter another number 86
	What is 143 times 72 10256		What is 237 times 86: 21562
	No, try again 10296		No, try again 20552
	Correct!		No, try again: give up
			The answer is 20382

(3)

(b) How can we pass arbitrary number of parameters to a function? What feature of Java support this? Write the code of a Java program in which to a method you can pass an arbitrary number of strings and the method displays them.

(4)

(c) In Java, there is an effect called "aliasing", which happens when you assign one object variable to another. This effect occurs when assigning variables of object types, but not when assigning variables of simple types. Why is this? Explain

(2)

(d) When you attempt to add a float, int and byte the result will be _____

(1)

5. (a) What is the difference between an instance method and a static method?

(2)

(b) Suppose st denotes a string that contains the last two digits of a year. Assume the year lies between 1970 and 2069. Write statements that will store the year in the int variable y, e.g. if st denotes the string "01", y will be set to the integer 2001.

(2)

(c) What is the error in the following lines of code? Fix the error.

```java
import java.io.*;
class Test
{   public static void main(String args[])
    {
        int x = 3, y = 4;
        System.out.println(mul(x, y));
    }
    int prod (int a, int b)
    {
        return (a*b);
    }
}
```

(d) What is an interface? What is the difference between an interface and abstract class? Can a class partially implement an interface, if yes how?

(3)

e) Can we declare an abstract method to be final? If No, State reason.

(1)

6. (a) What is wrong with the following interface? Fix the error.

```java
public interface SomethingIsWrong {
    void aMethod(int aValue){
        System.out.println("Hi");
    }
}
```

(2)

(b) What are wrapper classes? What is the super class of all the wrapper classes. and what abstract methods it defines? What final field members are defined in the Double Wrapper?

(2)

(c) Demonstrate the use of isInfinte( ) and isNaN( ) methods in the Double class with an example.

(2)

d) Define a class Item having a field title of type String and two subclasses Book and Periodical that might be included in a very simple program for keeping records of items in a library. A Book will have a title, an author and an ISBN number, all of which will be of type String. A Periodical will have a title which is a string, and a count of how many times a year the periodical is published

Include in the class Book a constructor Book(t,a,i) which will create a new Book object with title t, author a, and ISBN number i. Define a similar constructor Periodical(t,n) for the Periodical class Also define for both classes an instance method display() which will display on the screen all the details of a book or periodical.

(4)