SAMPLE PAPER – 2008
CLASS – X
SUBJECT – COMPUTER APPLICATIONS

Answers to this paper must be written on the paper provided separately.
*You will **not** be allowed to write during the first **15** minutes.*

This time is to be spent in reading the question paper.

The time given at the head of this paper is the time allowed for writing the answers.

This paper is divided into two Sections.

*Attempt **all** questions from **Section A** and **any four** questions from **Section B.***

The intended marks for questions or parts of questions are given in brackets [ ].

SECTION A (40 Marks)

*Attempt **all** questions.*

Question 1

(a). Define *encapsulation.*

Encapsulation is one of the core concepts of Object Oriented Programming. It is the binding or the wrapping up of variables and functions.

(b). Explain the term *object* using an example.

An object is an instance of a class.

(c). Define a *variable.*

A variable is a memory location by a particular name.

(d). What is a *wrapper Class?* Give an example.

A Wrapper Class is a primitive data type. Example could be Integer, Character etc.

(e). What is the purpose of the *new* operator?   [10]

A new operator is used to create an Object or an array.

Question 2

(a). State two kinds of *data types.*

The two kinds of Data Types are:

(i). Primitive
(ii). Non-Primitive Data Types.

(b). Write the corresponding expressions for the following mathematical operations:-

(i). $a^2 + b^2$

Math.pow(a,2) + Math.pow(b,2);

(ii). $z = x^3 + y^3 - xy/z$

z = Math.pow(x,3) + Math.pow(y,3) - (x * y) / z;

(iii). Define an *impure function.*

An impure function is a function which changes the state of an object.

(iv). Differentiate between *if* and *switch* statements.

Switch accepts only int or character whereas if accepts any data type accordingly.

Switch statement supports equality whereas the if statement supports all other relations accordingly.

Switch examines only one condition whereas if can examine multiple conditions.

(v). What will be the output for the following program segment?

String s = new String("abc");
System.out.println(s.toUpperCase( ));   [10]

ABC

[READ S.Chand Question Bank for ICSE by Dheeraj Mehrotra]

Question 3

(a). What is meant by *private visibility of a method?* [2]

The private visibility of a method means that the method can not be accessed outside the class.

(b). Find and correct the errors in the following program segment:-
int n[ ] = (2,4,6,8,10);
for (int i = 0;i<=5;i++)
System.out.println("n["+ i +"] + n[i]); [2]

int n[ ] = { 2,4, 6, 8, 10};
for (int i = 0; i<5; i++)
System.out.println("n["+i+"]"+n[i]);

(c). Explain *function overloading* with an example. [4]

It is same as Implementing Polymorphism.It is a feature that allows one interface to be used for general class of actions. The specific action is determined by the exact nature of the situation. More generally the concept of polymorphism is often expressed by the phrase "one interface, multiple methods".

worktodo(int a, int b);
worktodo(int a);

[READ S.Chand Question Bank for ICSE by Dheeraj Mehrotra]

(d). Find the output of the following program segment, when:

(i). val = 500
(ii). val = 1600

int val, sum, n=550;
sum = n + val > 1750 ? 400 : 200;
System.out.println(sum); [2]

(i). 200

(ii). 400

if precedence is not considered:

(i). 750

(ii). 750

(e). What is a *default constructor?*   [2]

A default constructor has no arguments, it has the same name as that of the class and is used to initialize instance variables with default values.

(f). What will be the output for the following program segment?

```
int a = 0,b=30,c=40;
a = --b + c++ + b;                                                       [2]
System.out.println("a = " +a);
```

a = 98.

[READ S.Chand Question Bank for ICSE by Dheeraj Mehrotra]

(g). Differentiate between *compareTo( )* and *equals( )* methods.   [2]

compareTo( ) method is used to check less than/ greater than conditions where as equals( ) checks only equality.

(h). What is a *package?* Give an example.   [2]

A *package* is a collection of related types providing access protection and name space management.
Example: io, lang, util etc.

(i). Explain the function of a *return* statement.   [2]

The return statement returns a value to the calling method within the program. It is also used to terminate the execution of a function.

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SECTION B (60 Marks)
Attempt **any four** questions from this section.

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[READ S.Chand Question Bank for ICSE by Dheeraj Mehrotra]
 Question 4
Write a program to calculate and print *the sum of odd numbers* and *the sum of even numbers* for the first *n* natural numbers.
The inteter *n* is to be entered by the user.   [15]

Solution:

```
Class numbers
{
        int sumeven=0;
        int sumodd = 0;
        public void work(int n)
        {
        for (int i=1; i<n; i++)
        {
                if (i%2 == 0)
                sumeven = sumeven+i;
                else
                sumodd = sumodd + i;
        }
        System.out.println("Sum of odd numbers is "+sumodd;
        System.out.println("Sum of even numbers is "+sumeven;
        }
        }
```

[READ S.Chand Question Bank for ICSE by Dheeraj Mehrotra]

Question 5

A cloth showroom has announced the following festival discounts on the purchase of items, based on the total cost of the items purchased: -

Total Cost	Discount (in Percentage)
Less than Rs. 2000	5%
Rs. 2001 to Rs. 5000	25%
Rs. 5001 to Rs. 10000	35%
Above Rs. 10000	50%

Write a program to input the total cost and to compute and display the amount to be paid by the customer after availing the discount.
        [15]

Solution:

```
class abcd
{
```

```
        public void check(int totalcost)
        {
                double cost = 0, amount = 0, discount = 0;
                if (totalcost<=2000)
                discount = 5;
                else if (totalcost<=5000)
                discount = 25;
                else if (totalcost<10000)
                doscount = 35;
                else
                discount = 50;
                amount = totalcost  - totalcost*discount/ 100;
                System.out.println("The Amount being paid by the customer is "+ amount);
        }
        }
```

Question 6

Consider the following statement:-
"January 26 is celebrated as the Republic Day of India".

Write a program to change *26* to *15, January* to *August, Republic* to *Independence* and finally print "August 15 is celebrated as the Independence Day of India".
        [15]

SOLUTION:

```
public class replace
{

   public void convert()
   {
   String str="26 january is celebrated as republic day  ";
   String sent="";
   String newstring="";
   int len=str.length();
   for(int i=0;i<len;i++)
   {
   char b=str.charAt(i); //extract characters
   if(b!=' ')      // till we do not get a space add characters to sent
   sent=sent+b;
```

```
else
{            // compare the word extracted with the words to be changed
int c=sent.compareTo("26");

int d=sent.compareTo("republic");
int e=sent.compareTo("january");
if(c==0)      // if the word exist replace with given words
   newstring=newstring+" 15 ";
else if(d==0)
   newstring=newstring+" independence ";
else if(e==0)
newstring+=" "+" august ";
else         // otherwise add the word as it is to newstring
newstring+=" "+sent;
sent="";
}
   }
System.out.println(newstring);
   }
}
```

Question 7

Write a program that outputs the results of the following evaluations based on the number entered by the user.

(i). Natural Logarithm of the number.
(ii). Absolute value of the number.
(iii). Square root of the number.
(iv). Random numbers between 0 and 1.   [15]

SOLUTION:

```
class random
   {
   public void numbers()
   {
   System.out.println("1. Natural Logarithm");
   System.out.println("2. Absolute Value");
   System.out.println("3. Square Root");
   System.out.println("4. Random Numbers between 0-1");
   System.out.println("Enter choice and a number");
```

```
}
/* Enter choice and number */
public void calculate(int choice, double number)
{
double n;
switch(choice)
{
case 1: n = Math.log(number);
System.out.println("The result is "+n);

break;
case 2: n = Math.abs(number);
System.out.println("The result is "+n);

break;
case 3: n = Math.sqrt(number);
System.out.println("The result is "+n);

break;
case 4: n = Math.random();
System.out.println("The result is "+n);

break;
}
}
}
```

Question 8

The marks obtained by 50 students in a subject are tabulated as follows:

Name	Marks
*	*
*	*

Write a program to input the names and marks of the students in the subject.

Calculate and display:-

(i). The subject average marks (subject average marks = subject total / 50)

(ii). The highest mark in the subject and the name of the student.
(The maximum marks in the subject are 100)   [15]

Solution:

```
class highest
   {

   // enter name and percentage of 50 children.

   String n;

   int high=0;  // To store the highest percentage.
   public void  calculate(String nam[],int perc[])

   {

   for(int i=0;i<perc.length;i++)
   {
   // To find the highest percentage and similarly store the name
   // in N.
   if(perc[i]>high)
   {
   high=perc[i];
   n=nam[i];
   }
   }
   System.out.println("highest percentage :"+high);
   System.out.println("name of the child :"+n);
   }
   }
```

Question 9

Write a program to accept 15 integers from the keyboard, assuming that no integer entered is zero. Perform *selection sort* on the integers and then print them in *ascending order*.
       [15]

Solution:

```
class array
   {// input 15 integers
   public void compute(int a[])
   {
   // selection sorting
```

```
    for(int i=0;i<a.length-1;i++)
    {
      for(int j=i+1;j<a.length;j++)
      {
        if(a[i]>a[j])
        {
        int t=a[i];
        a[i]=a[j];
        a[j]=t;
        }
      }
    }
    // display
    for(int i=0;i<a.length;i++)
    System.out.println(a[i]);
    }
    }
```