2012
SECTION A (40 MARKS)
Attempt all questions

Question 1

(a) Give one example for a primitive data type and a composite data type. [2]

(b) Give one point of difference between unary and binary operators. [2]

(c) Differentiate between call by value and call by reference [2]

(d) Write Java expression for $\sqrt{2}as + u^2$ [2]

(e) Name the type of error (syntax, runtime and logical)
    i.   Division by a variable that contains a value of zero
    ii. Multiplication operator used for division   iii. Missing semicolon.

Question 2

(a) Create a class with one integer instance variable. Initialize the variable using
    i.   default constructor ii. parameterized constructor. [2]

(b) Complete the code below to create an object for Scanner class.
    Scanner sc=____ Scanner(_____) [2]

(c) What is an array? Write a statement to declare an integer array of 10 elements. [2]

(d) Name the search or sort algorithm that:
    i.   Makes several passes through the array, selecting the next smallest item in the array each time and palcing it where it belongs in the array.
    ii. At each stage compares the sought key value with key value of middle element of the array. [2]

(e) Differentiate between public and private modifier for members of a class. [2]

Question 3

(a) What are the values of x and y when the following statements are executed?
    int a=63, b=36;
    boolean x=(a>b) ? true : false;
    int y=(a<b) ? a : b; [2]

(b) State the value n and ch
    char c= 'A'; int n=c+1; char ch=(char)n; [2]

(c) What will be result stored in x after evaluating the following statements are executed?
    int x=4; x+=(x++)+(++x)+x; [2]

(d) Give the output of the following program segment:
    double x=2.9,y=2.5;
    System.out.println(Math.min(Math.floor(x),y));
    System.out.println(Math.max(Math.ceil(x),y)); [2]

(e) State the output of the following program segment:
    String s= "Examination"; int n=s.length();
    System.out.println(s.startsWith(s.substring(5,n)));
    System.out.println(s.charAt(2)==s.charAt(6)); [2]

(f) State the method that
    i.   Converts a string to primitive float data type.
    ii. Determines if the specified character is an uppercase character. [2]

(g) State the data type and values of **a** and **b** after the following segment is executed.
    String s1= "Computer",s2= "Applications";
    a=(s1.compareTo(s2)); b=(s1.equals(s2)); [2]

(h) What will be the following code output?
    String s= "malayalam";
    System.out.println(s.indexOf('m')); System.out.println(s.lastIndexOf('m')); [2]

(i) Rewrite the following program segment using *while* instead of *for*.
    int f=1,i;
    for(i=1;i<=5;i++)
    { f*=i; System.out.println(f); } [2]

(j) In the program given below, state the name and the value of the
    i.   method argument or argument variable   iii. local variable
    ii. class variable   iv. instance variable

```
class myClass {
static int x=7; int y=2;
public static void main(String args[]) {
myClass obj = new myClass();
System.out.println(x);
obj.sampleMethod(5);
int a=6;
System.out.println(a);
}
void sampleMethod(int n) {
System.out.println(n);
System.out.println(y);
}
```
[2]

2012
SECTION B (60 MARKS)
Attempt any four questions

Question 4
Define a class Library with followings:
Instance Variables:
int acc_num	- stores the accession number of the book
String title	- stores the title of the book
String author	- stores the name of the author

Member methods:
1) void input()   To input and store the accession number, title and author
2) void compute()   To accept the number of days late, calculate and display the fine charged of Rs. 2 per day
3) void display()   To display the details in the following format:

Accession Number   Title   Author

Write a main method to create an object of the class and call the above methods   [15]

Question 5
Given below is a hypothetical table showing rates of income tax for male citizen below the age of 65 years:

Taxable Income (TI) in Rs.	Income Tax in Rs.
Does not exceed Rs. 1,60,000	Nil
Is greater than Rs. 1,60,000 & less than or equal to Rs 5,00,000	(TI – 1,60,000) x 10%
Is greater than Rs. 5,00,000 & less than or equal to Rs 8,00,000	[(TI – 5,00,000) x 20%] + 34,000
Is greater than Rs. 8,00,000	[(TI – 8,00,000) x 30%] + 94,000

Write a program to input the age, gender (male or female) and Taxable Income of a person.
If the age is more than 65 years **or** the gender is female, display "wrong category".
If the age is less than or equal to 65 years and the gender is male, compute and display the Income Tax payable as per the table given above.

Question 6
Write a program to accept a string. Convert the string to uppercase. Count and output the number of double letter sequences that exist in the string.
Sample Input: "SHE WAS FEEDING THE LITTLE RABBIT WITH AN APPLE"
Sample Output: 4   [15]

Question 7
Design a class to overload a function polygon() as follows:
(i) void polygon(int a, char ch)   with one integer argument and one character argument that draws a filled square of side **n** using the character stored in ch
(ii) void polygon(int x, int y)   with two integer arguments that draws a filled rectangle of length **x** and breadth **y** using the symbol '**@**'
(iii) void polygon()   with no argument that draws a filled triangle shown below.
Example
(i) Input value of a=2,ch= 'O'
        Output: OO
                OO
(ii) Input value of x=2, y=5
        Output: @ @ @ @ @
                @ @ @ @ @
(iii) Output: *
             **
             ***

Question 8
Using the switch statement write a menu driven program to:
(i) Generate and display the first 10 terms of the Fibonacci series 0, 1, 1, 2, 3, 5 …
(ii) Find the sum of the digits of an integer that is input.
        Sample input: 15390
        Sample output: Sum of digits=18
For an incorrect choice an appropriate error message should be displayed.

Question 9
Write a program to accept the names of 10 cities in a single dimension array and their STD codes in another single dimensional integer array. Search for a name of a city input by the user in the list.
If found display "Search successful" and print the name of the city along with its STD code,
else display the message "Search Unsucesssful, No such city in the list".   [15]