

Class 10  
**Computer Application**  
According to ICSE-2020 syllabus

**FIRST TERM :**

**Contents:**

1. Revising Java concepts
6. Class as the basis of all computation
5. User-defined Methods
7. Constructors
2. Using Library classes
8. Encapsulation & Inheritance

**Chapter 1: Revisiting Basic Java Concepts**

**1. What is Object Oriented Programming?**

**Ans:** The object oriented programming is an approach which focuses a problem in terms of classes and objects. OOP determines the classes and objects needed for the solution and provides a full set of operations for each class.

**2. List the concepts of OOPs.**

**Ans:** The concepts of OOPs are:

- Encapsulation
- Data Abstraction
- Modularity
- Inheritance
- Polymorphism

**3. Why is Java termed as a platform?**

**Ans:** The term platform is a combination of hardware and system software where a programme can run. Java platform is a software platform that can deliver and run highly interactive and secure applications on network.

**4. Name three types of Java programs./ Name the application areas of Java.**

**Ans:** Three types of Java programs are :

- i. Stand alone : General Application Programme
- ii. Applets : Application Programme based on Internet
- iii. Servlet : Server based programme

## 5. What is Unicode?

**Ans:** Java uses the character sets called **Unicode**. It consists of 65,536 symbols. Each character in Unicode occupies 2 bytes memory.

## 6. What are keywords? Can keywords be used as identifiers?

**Ans:** Keywords are the reserve words that convey a special meaning to the language compiler.

No, keywords are reserved for special purpose and must not be used as identifiers.

## 7. What is an identifier? What is the identifier formatting rule of Java? OR What are the rules for naming a variable?

**Ans:** Identifiers are the names given by a programmer in different parts of a program. For examples variables, methods, classes, packages etc. The rules for naming identifiers in Java are:

- (i) Can contain alphabets, digits, dollar sign and underscore.
- (ii) Must not start with a digit.
- (iii) Cannot be Java keywords.
- (iv) Can have any length.
- (v) case-sensitive.

## 8. Why keyword is different from identifiers?

**Ans:** Keywords are predefined sets of reserved words that have a special meaning for the Java compiler. Identifiers on the other hand are created by Java programmers in order to give names to variables, function, classes etc.

## 9. State the difference between Token and Identifier.[2008]

**Ans:** The smallest individual unit of a program is known as Token. Every unit that makes a statement is known as a token. The following Tokens are available in Java: Keywords, Identifiers, Literals, Punctuations and Operators.

Identifiers are names given by the programmer to different parts of a program e.g. variables, functions, classes etc.

## 10. What are literals? How many types of integer literals are available in Java?

**Ans:** A literal is sequence of characters used in a program to represent a constant value. For example 'A' is a literal that represents the value A of type char, and 17L is a literal that represents the number 17 as value of type long. Different types of literals available in Java, they are: Integer literal, Float literal, Boolean literal, Character literal, String literal and null literal.

Integer literals are of three types – Decimal Integer literal (9) , Octal integer literal(09) and Hexadecimal integer literal (0X9)

## 11. What is an integer constant? Write integer forming rule of Java.

**Ans:** Integer constants are whole numbers without any decimal point. The rule for forming integer constants is: An integer constant must have at least one digit and cannot contain a decimal point. It may contains + or – sign. A number with no sign is interpreted to be positive.

## 12. What do you mean by Escape sequence and name few escape sequences in Java?

**Ans:** Java has certain nongraphic characters (nongraphic characters are those characters that cannot be typed directly from keyboard e.g. backspace, tab, carriage return etc.). These nongraphic characters can be represented by escape sequence. An escape sequence is represented by backslash followed by one or more character. The few escape sequence characters are: \n for new line, \t for Horizontal Tab, \v for Vertical Tab, \b for Backspace, \" for Double Quotes etc.

**13. What is meant by a floating constant in Java? How many ways can a floating constant be represented into?**

**Ans:** Floating constants are real numbers with fractional points. A floating constant can either be represented in fractional form (e.g. 0.00456) or in exponent form (e.g. 4.56E-03).

**14. Differentiate between Integer and Floating type constants.**

**Ans:** Integer constants are the whole numbers (without decimal points). e.g. 1231. Floating point constants are fractional numbers (number with decimal points). e.g. 14.2356

**15. What is a type or 'Data Type'? How this term is related to programming?**

**Ans:** A type or datatype represents a set of possible values. When we specify that a variable has certain type, we are saying what values the expression can have. For example to say that a variable is of type int says that integer values in a certain range can be stored in that variable.

Datatypes in programming are the means to identify the type of data and the associated operations of handling it.

**16. What is primitive data type? Name its different types.**

**Ans:** Primitive (fundamental or predefined) is defined as the set of possible values a variable can hold. They are provided by the programming language to store data in a variable. Java has eight primitive data types: byte, short, int, long, float, double, char and boolean

**17. Differentiate the two kinds of data types? [2006]**

**Ans:** The two types of data types are: Primitive and non-primitive/composite/user define data types.

The primitive data types are the basic datatypes provided by the language. It is used to define and hold a value in a named variable. They are: byte, short, int, long, float, double, char and boolean.

The non-primitive/reference data types are created using primitive datatypes. It is used to store the memory address of an object. The reference datatypes are: class, array and interface.

**18. How many bytes occupied by the following data types: byte, short, int, long, float, double, char, boolean.**

**Ans:** char-2 byte, byte-1 byte, short-2 bytes, int-4 bytes, long-8 bytes, float-4 bytes, double-8 bytes, boolean-Java reserve 8 bits but only use 1 bit.

**19. What is the range of the following data types: byte, short, int, long, float, double, char, boolean.**

**Ans:** byte  $\rightarrow -2^7$  to  $+2^7-1$

short  $\rightarrow -2^{15}$  to  $2^{15}-1$

int  $\rightarrow -2^{31}$  to  $2^{31}-1$

long  $\rightarrow -2^{63}$  to  $2^{63}-1$

float  $\rightarrow -3.4 \times 10^{38}$  to  $3.4 \times 10^{38}$

double  $\rightarrow -1.7 \times 10^{308}$  to  $1.7 \times 10^{308}$

char  $\rightarrow 0$  to 65536

boolean  $\rightarrow$  true or false

## 20. What do you mean by variables? [2006]

**Ans:** A variable is a named memory location, which holds a data value of a particular data types. E.g. double p;

## 21. What do you mean by variables? What do you mean by dynamic initialization of a variable?

**Ans:** A variable is a named memory location, which holds a data value of a particular data types. When a method or functions is called and the return value is initialized to a variable it is called dynamic initialisation. Variables are initialized during execution of a program.

e.g. double p = Math.pow(2,3);

double square = n \* n ;

## 22. What is the function of an operator? Name the types.

**Ans:** Operators are special symbols that represent operations that can be carried out on variables, constants or expressions.

The different types of operators are:

Arithmetic operator

Increment/Decrement

Relational operators

Logical Operators

Assignment

Other operators( instanceof , .(dot) , conditional operator ?:

## 23. What do you mean by operator and write the name of all operators given in your textbook.

**Ans:** The operations are represented by operators and the object of the operations are referred to as operands. The types of Operators available in Java are: 1. Arithmetic 2. Increment/Decrement 3. Relational 4. Logical 5. Assignment 6. Conditional 7. [ ] operator 8. new operator 9. (type) cast Operator 10. ( ) operator. 11. dot operator.

## 24. What are arithmetic operators?

**Ans:** Arithmetical operators are used for various mathematical calculations. The result of an arithmetical expression is numerical values. Arithmetical operators are of following types: Unary and Binary operators.

## 25. Write major difference between the unary and binary operators?

**Ans:** The operators that acts on one operand are referred to as Unary Operator. There are two Unary operators Unary + operator and Unary – operator. The operators that acts upon two operands are referred to as Binary Operator. The Binary Operators are Addition(+), Subtraction (-), Multiplication (\*), Division (/) and Modulus (%).

## 26. What is increment operator? What are postfix and prefix increment operators?

**Ans:** The '++' operator is called increment operator. The increment operators add 1 to its operand. These are two types (i) Prefix and (ii) Postfix The prefix version comes before the operand for e.g. ++a, where as postfix comes after the operand e.g. a++

## 27. Find the value of x after evaluating $x += x++ + -x + 4$ where $x=3$ before the evaluation. Explain your answer.

**Ans:** Result is 13, because  $x++$  is 3,  $-x$  is  $2 + 4$  the answer is 9 add this with  $x$  that is 3 it becomes 12 and due to pre increment of  $x++$  the result becomes 13.

### **28. What do you mean by Relational Operators?**

Ans: Relational operators are used to determine the relationship between different operands. These are used in work of comparison also. The relational expression (condition) returns 0 if the relation is false and return 1 if the relation is true. The relational operators are as follows : < (less than), > (greater than), < = (less than equals to), > = (greater than equals to), = (equals to), != (not equals to).

### **29. What is Logical operators?**

Ans: The logical operators combine the result of two or more than two expressions. The mode of connecting relationship in these expressions refers as logical and the expressions are called logical expression. The logical expression returns 1 if the result is true otherwise 0 returns. The logical operators provided by Java are && Logical AND, || Logical OR, ! Logical NOT.

### **30. What do you mean by Assignment Statement or Assignment Operator?**

Ans: Assignment operator is represented by symbol '=' and is used to assign one value to another. It takes the value on the right and stores it in the left.

e.g. `z=y*y; x=5;`

### **31. Illustrate '?' operator with an example? [2009]**

Ans: It is a conditional operator, that stores a value depending upon a condition. This operator is also known as ternary operator. The syntax for this operator is `expression1?expression2:expression3` . and the example is `bonus=sales>15000?250:50;`

### **32. What is the purpose of new operator? [2006]**

Ans: We can use new operator to create a new objects or new array.

Ex. `myCar obj = new myCar();`

`int arr[ ] = new int[5];`

### **33. What do you mean by precedence? Illustrate with the help of example.**

Ans: Precedence is the order in which a program evaluates the operations in a formula or expression. All operators have precedence value. An operator with higher precedence value is evaluated first then the operator having lower precedence value. consider the following example

`x = 5 + 4 *9;`

The value of this expression is 29 not 54 or 34. Multiplication has been performed first in this expression.

### **34. What are operands?**

Ans: An operator acts on different data items/entities called operands. The objects of the operation are referred as operands.

**35. What do you mean by constant? How you declare a variable as constant variables.**

Ans: The memory variables/locations whose values cannot be changed within the program is called constants ( literals ). Java allows several literal like integer, floating, boolean, character, String and null literal.

The keyword *final* makes a variable as constant.

e.g. `final int x=203;`

**36. Which class is used for using different mathematical function in Java program? [2007]**

Ans: The class used for different mathematical functions in Java is `java.lang.Math`.

**37. Write down the equivalent expression for the mathematical expression**

(a)  $\frac{\cos x}{\tan x - 1}$

(b)  $|e^x - x|$

Ans: `Math.cos(x)/(Math.tan(x) + 1)` and `Math.abs(Math.exp(x)-x)`

**38. What is the difference between these two function `Math.ceil()` and `Math rint()`, explain with example.**

Ans: `Math.ceil()` this function returns the smallest whole number greater than or equal to the given number. e.g. `Math.ceil(12.85)` gives output 13 and `Math.ceil(12.35)` also gives output 13. Whereas the `Math.rint()` returns the roundup nearest integer value. e.g. `Math.rint(12.85)` gives output 13 but `Math.rint(12.35)` gives output 12.

**39. What do you mean by type conversion? What is the difference between implicit and explicit type conversion explain with example.**

Ans: The process of converting one predefined type into another is called Type Conversion.

An implicit type conversion is a conversion performed by the compiler. The Java compiler converts all operands up to the type of the largest operand. This is also known as type promotion. e.g. 'c'-32 is converted to int type. Where as an explicit type conversion is user defined that forces an expression to be of specific type, this also known as type casting.

e.g. `(float) ( x + y / 2 )`

**40. What is coercion? How it is implemented?**

Ans: Implicit type conversion of an expression is termed as coercion. An implicit type conversion is a conversion performed by the compiler. The Java compiler converts all operands up to the type of the largest operand. This is default type conversion.

**41. What do you mean by type casting? What is the type cast operator? [2007]**

Ans: The explicit conversion of an operand to a specific type is called type casting. The operator that converts its operand to a specified type is called the typecast operator. The typecast operator is ( ) in Java and is used as (type-to-be-converted-in)

**42. Explain the methods print( ) and println( )?**

Ans: A computer program is written to manipulate a given set of data and to display or print the results. Java supports two output methods that can be used to send the results to the screen. print( ) method println( ) method.

The print( ) method sends information into a buffer. This buffer is not flushed until a new line (or end-of-line) character is sent. As a result print() method prints output on one line.

The println( ) method by contrast takes the information provided and displays it on a line followed by a line feed.

**43. What is an Expression? Explain its different types.**

Ans: An Expression is any statement which is composed of one or more operands and which returns a value. It may be combination of operators, variables and constants. There are different types of expressions.

- (1) Constant Expressions:  $8 * 12 / 2$
- (2) Integral Expressions: formed by connecting integer constants  $x = (a + b)/2$
- (3) Logical Expressions:  $a > b$  or  $a != b$
- (4) Boolean expression:  $(y+z) >= (x/z)$

**44. Mention two different styles of expressing a comment in a program. [2005]**

Ans: The two ways of inserting comments in a program are:

- (i) using //                      single line comments
- (ii) using /\*    \*/              multiple line comments
- (iii) using /\*\*    \*/            documentation

**45. What is a compound Statement? Give an Example. [2005]**

Ans: It is a block of code containing more than one executable statement. In Java the { } is called block and the statements written under { } is called compound statements or block statement. The { } opening and closing braces indicates the start and end of a compound statement.

```
for(int i=1;i<=5;i++)
```

```
{  
System.out.println("Hello");  
System.out.println("How");  
System.out.println("are you?");  
}
```

## **Conditional constructs in Java**

### **1. What are the three constructs that govern statement flow?**

Ans: The three constructs that governs statement flow are: Sequence, Selection and Iteration constructs.

### **2. What is a selection/conditional statement? Which selection statement does Java provides?**

Ans: A selection statement is the one that is used to decide which statement should be executed next. This decision is based upon a test condition. The selection statements provided by Java are: if-else and switch. The conditional operator ?: can also be used to take simple decision.

### **3. What is an 'if' statement? Explain with an example.**

Ans: The 'if' statement helps in selecting one alternative out of the two. The execution of 'if' statement starts with the evaluation of condition. The 'if' statement therefore helps the programmer to test for the condition. General form of 'if' statement.

```
if(expression) statement  
if(marks>=80)  
System.out.println("Grade A");
```

### **4. What is the significance of a test-condition in an if statement?**

Ans: It is the test condition of an *if* statement that decides whether the code associated with the if part or the one associated with the else part should be executed. The former is executed if the test condition evaluates to true and the latter works if the condition evaluates to false.

### **5. Write one advantage and one disadvantage of using ?: in place of an if.**

Ans: Advantage: It leads to a more compact program.

Disadvantage: Nested ?: becomes difficult to understand or manage.

### **1. What do you understand by nested 'if' statements?**

OR

### **1. Explain with an example the if-else-if construct. [2007]**



Ans: A nested 'if' is an statement that has another 'if' in its body or in it's appearance. It takes the following general form.

```
if(ch>='A')
{
    if(ch<='Z')
        ++upcase;
    else
        ++other;
}
```

6. What is the problem of dangling-else? When does it arise? What is the default dangling-else matching and how it is overridden?

Ans: The nested if-else statement introduces a source of potential ambiguity referred to as dangling-else problem. This problem arises when in a nested if statement, number of if's is more than the number of else clause. The question then arises, with which if does the additional else clause property match. For Example

```
if(ch>='A')
if(ch<='Z')
++upcase;
else
++other;
```

The indentation in the above code fragment indicates that programmer wants the else to be with the outer if. However Java matches an else with the preceding unmatched if. One method for over-riding the default dangling-else matching is to place the last occurring unmatched if in a compound statement, as it is shown below.

```
if(ch>='A')
{
if(ch<='Z')
++upcase;
}
else
++other;
```

7. Compare if with ?:(Ternary operator)?

Ans: (i) Compare to IF sequence, ?: offer more concise, clean and compact code, but it is less obvious as compared to IF. (ii) Another difference is that the conditional operator ?: produces an expression, and hence a single value can be assigned, for larger expression If is more flexible. (iii) When ?: operator is used in its nested form, it becomes complex and difficult to understand.

8. What is a switch statement? How is a switch statement executed?

Ans: Switch statement successively tests the value of an expression against a set of integers or character constants. When a match is found, the statements associated with the constants are executed. The syntax :

```
switch(expression)
{
case constants : statements; break;
case constants : statements; break;
default:
}
```

The expression is evaluated and its values are matched against the value of the constants specified in the case statements. When a match is found, the statements sequence associated with that case is executed until the break statement or the end of switch statement is reached.

9. What is the significance of break statement in a switch statement?

Ans: In switch statement when a match is found the statement sequence of that case is executed until a 'break' statement is found or the end of switch is reached, when a 'break' statement is found program execution jumps to the line of code following the switch statement.

10. What is a control variable in a switch case?

Ans: A control variable in switch case is one which guides the control to jump on a specified case. e.g. switch(x), here 'x' is the control variable.

11. What is a "fall through"?

Ans: The term "fall through" refers to the way the switch statement executes its various case sections. Every statement that follows the selected case section will be executed unless a break statement is encountered.

12. What is the effect of absence of break in a switch statement?

Ans: Absence of break statement in a switch statement leads to situation called "fall through" where once a matching case is found the subsequent case blocks are executed unconditionally

13. Write one limitation and one advantage of switch statement?

Ans: Advantage: More efficient in case a value is to be tested against a set of constants. Disadvantage: switch can test only for equality, so for the rest of comparisons one needs to use if-else.

14. Discuss when does an if statement prove more advantageous than switch statement.

Ans: In the following case if statement proves to be more advantage over switch statement: (i) When a range of values need to be tested for. (ii) When relation between multiple variables needs to be tested. (iii) When multiple conditions need to be tested. (iv) When expressions having a data type other than integer or character need to be tested.

15. When does switch statement prove more advantageous over an if statement?

Ans: The switch statement is more advantageous than the if statement when the test expression whose data type is either of byte, short, character, integer or long is to be tested against a set of constants. The reason being that the switch statement evaluates the expression once whereas the equivalent if statement evaluates the expression repeatedly.

16. Explain, with the help of an example, the purpose of default in a switch statement. [2005]

Ans: The default section is an optional part of the switch statement and the statement written under default clause are executed when no matching case is found.

```
switch(n)
```

```
{
```

```
case 1: System.out.println("Sunday"); break;  
case 2: System.out.println("Monday"); break;  
case 3: System.out.println("Tuesday"); break;  
case 4: System.out.println("Wednesday"); break;  
case 5: System.out.println("Thursday"); break;  
case 6: System.out.println("Friday"); break;  
case 7: System.out.println("Saturday"); break;  
default : System.out.println("Invalid Input");  
}
```

17. Differentiate between if and switch statements. [2006]

Ans: Both are used as a selection statements, there are some difference in their operations. (i) switch can only test for equality, where as if can evaluate a relational or logical expression. (ii) if statement can handle ranges , where as switch case level must be a single value. (iii) if statement can handle floating point test also, where as the switch case labels must be an integer or character.

## Loops

1. What are iteration statements? Name the iteration statements provided by Java?

Ans: Iteration statements are statements that allows a set of instructions to be executed repeatedly till some condition is satisfied. The iteration statements provided by Java are: for loop, while loop, do-while loop.

2. What is the difference between entry controlled and exit controlled loop? or

What is the difference between while and do-while loop?

Ans: While loop is known as entry controlled loop and do-while loop is known as exit-controlled loop. The differences between these two loops are: (1) In while loop the test expression is evaluated at the beginning where as in do-while loop test expression is evaluated at the bottom, after the body of the loop. (2) In while loop if the test expression is false loop does not continued but in do-while whatever the test expression may be the loop execute at least once.

3. Explain the difference between break and continue with an example. [2005] [2008]

Ans: Both statements are used as a jump statement. The break statement terminates the loop, but the continue statement skips the rest of the loop statement and continues with the next iteration of the loop.

e.g. Break Statement

```
int i=0;
while(i<=10)
{
i++;
if(i==5)
break;
System.out.println(i);
}
```

e.g. Continue Statement

```
int i=0;
while(i<=10)
{
i++;
if(i==5)
continue;
System.out.println(i);
}
```

4. Compare and discuss the suitability of three loops in different situation?

Ans: (i) The for loop should be preferred if number of iteration is known beforehand. (ii) The while loop should be preferred if the number iteration is dependent upon some control variable. (iii) The do-while loop should be preferred if the number of iterations is dependent upon user response.

5. Explain the term for loop with an example. [2005]

Ans: In Java the 'for' statement is the most common iterative statement. The general syntax of the for loop is,

```
for(initialization; test-expression; increment)
{
body of the loop
}
```

This loop is executed at initial value, condition and increment. Three statement separated by semi colons are placed within the parenthesis. For example:

```
for(int i=1;i<=10;i++)
{
System.out.println(i);
}
```

6. State one similarity and one difference between while and do-while loop. [2005]

Ans: Similarity: In both loops the increment statement is given inside the loop. Difference: In while loop the test expression is evaluated at the beginning where as in do-while loop test expression is evaluated at the end, after the body of the loop.

7. What do you meant by an infinite loop? Give an example. [2008]

Ans: Infinite loop is an endless loop whose number of iterations is not fixed.

eg: for( ; ; )

```
System.out.println("School");
```

8. Differentiate fixed and variable iterative type of loops.

Ans: Fixed type of iterative loop is created when the process is to be repeated for defined number of times. Variable iterative loop repeats the process till a given condition is true.

9. Differentiate Null loop and Infinite loop.

Ans: A Null loop does not contain any statement to repeat where as infinite loop repeats execution of the statements for endless iterations.

e.g. null loop : for(int i=1;i<=10;i++);

e.g. infinite loop: for(int i=10;i>=1;i++)

10. What do you mean by delay loop?

Ans: A null loop is also called delay loop which does not repeat the execution of any statement but keeps the control engaged until the iterations are completed.

## Chapter 6: **Class as the basis of all Computation**

1. Why is Java often termed as a platform?

Ans: Platform is the environment in which programs execute. Instead of interacting with the Operating System directly, Java programs runs on a virtual machine provided by Java, therefore Java is often referred to as a platform also.

2. What is a bytecode?

Ans: Bytecode is a set of pseudo machine language instructions that are understood by the JVM (Java Virtual Machine) and are independent of the underlying hardware.

3. What do you understand by JVM?

Ans: JVM or Java Virtual Machine is an abstract machine designed to be implemented on top of existing processors. It hides the underlying OS from Java application. Programs written in Java are compiled into Java byte-code, which is then interpreted by a special java Interpreter for a specific platform. Actually this Java interpreter is known as Java Virtual Machine (JVM).

4. What is JDK (Java Development Kit)?

Ans: The Java development kit comes with a collection of tools that are used for developing and running java programs.

5. What are Java APIs?

Ans: The Java APIs (Application Program Interface) consist of libraries of pre-compiled code that programmers can use in their application.

6. Write the five characteristics of Java/BlueJ?

Ans: 1. Write Once Run Anywhere 2. Light weight code 3. Security 4. Built in Graphics 5. Object Oriented Language 6. Support Multimedia 7. Platform Independent. 8. Open Product.

7. What do you know about BlueJ?

Ans: BlueJ is a Java development environment. It is an IDE (Integrated Development Environment), which includes an editor a debugger and a viewer.

8. How you create, compile and execute a program in Java or BlueJ? Explain your answer?

Ans: Create: Click on new class button from BlueJ editor, then type the class name a program icon will be created. Double click on it, a program editor will be open, erase the code and type your program coding. Compile: click the compile button on the left of the window or right click on the class icon and select compile from the menu options. Execute: Right click on the class icon and select new class name option. A dialogue box appears type the name of the object. An object icon will be created at the bottom. Right click on the object icon and select the method we want to execute.

9. State the differences between Syntax errors and Logical errors.

Ans: The compiler can only translate a program if the program is syntactically correct; otherwise the compilation fails and you will not be able to run your program. Syntax refers to the structure of your program and the rules about that structure.

The second type of error is a run-time error, so-called because the error does not appear until you run the program. In Java, run-time errors occur when the interpreter is running the byte code and something goes wrong.

10. "Object is an instance of a class", Explain

Ans: Object of a class contains data and functions provided in a class. it possesses all the features of a class. Hence object is termed as instance of a class.

11. Name four basic features of JAVA.

Ans: Basic features of Java as follows:

- i) It is an object oriented language.
- ii) Java program is both compiled and interpreted.
- iii) Java program can be application or applet.
- iv) Java is case sensitive language, i.e. it distinguished upper and lower case letters.

12. Java uses compiler as well as interpreter, explain.

Ans: Java compiler converts Java source code to byte code. This byte code is further converted into machine code to make it applicable for the specific platform by using interpreter.

13. Differentiate between Source code and Byte code.

Ans: Source code is the program developed in Java Language, which is input to a computer through the keyboard. Compiler converts source code to byte code for interpretation.

14. Differentiate between Testing and Debugging.

Ans: Testing is the process of checking program logic manually to ensure whether it contains any error or not. Debugging is the process of removing errors from a program.

16. What is an Object?

Ans: An Object is an identifiable entity with some characteristics and behavior. E.g. take a class 'Car'. A car class has characteristics like colour, gears, power, length etc. now we create the object of that class 'Car' namely 'ZEN'.

18. Explain all the Concepts of OOP's?

Ans: Abstraction: It refers to the act of representing essential features without including the background details or explanation. Encapsulation: It is the way of combining both data and the function that operates on the data under a single unit. Modularity: It is the property of a system that has been decomposed into a set of cohesive and loosely couple modules. Inheritance: It is the capability of one class of thing to inherit properties from another class. Polymorphism: It is the ability for a message or data to be processed in more then one form.

19. What are the advantages of OOP's?

Ans: (1) Elimination of redundant coding system and usage of existing classes through inheritance. (2) Program can be developed by sharing existing modules. (3) Possibilities of multiple instance of an object without any interference. (4) Security of data values from other segment of the program through data hiding.

20. What is Class? How Object is related to the Class?

Ans: A Class represents a set of Objects that share common characteristics and behavior. Objects are instance of a class. The Object represents the abstraction representation by the class in the real sense.

21. What is the need of a class in Java?

Ans: Classes in Java are needed to represent real-world entities, which have data type properties. Classes provide convenient methods for packing together a group of logical related data items and functions that work on them. In java the data items are called fields & the functions are called methods.

22. What are Methods? How are these related to Objects?



Ans: A Method is an operation associated to an Object. The behavior of an Object is represented through associated functions, which are called Methods.

23. Write differences between Procedural Programming and Object Oriented Programming.

Ans: Procedural programming aims more at procedures. The emphasis is a doing things rather than the data being used. In procedural Programming parading data are shared among all the functions participating thereby risking data safety and security. Object Oriented Programming is based on principles of data hiding, abstraction, inheritance and polymorphism. It implements programs using classes and objects, In OOP's data and procedure both given equal importance. Data and functions are encapsulated to ensure data safety and security.

24. What is an abstraction?

Ans: Abstraction is the representation of essential features of a system without getting involved with the complexity of the entire system. It is a named collection of attributes and behaviors required to represent an entity or concept for some particular problem domain.

25. What is inheritance and how it is useful in Java. [2008]

Ans: It is process by which objects of one class acquire the properties of objects of another class. Inheritance supports the concepts of hierarchical representation. In OOP the concepts of inheritance provides the idea of reusability.

26. What role does polymorphism play as java feature?

Ans: polymorphism is a property by which the same message can be sent to objects of several different classes, and each object can respond in a different way depending on its class. It means the ability to take more than one form. For example, the same operation is performed differently depending upon the data types.

5+7=12 and 'a'+bc'=abc

27. What is Data hiding?

Ans: Data Hiding means restricting the accessibility of data associated with an object in such a way that it can be used only through the member methods of the object.

28. Differentiate between base and derived class.

Ans: BASE CLASS – A class from which another class inherits (Also called SUPER CLASS)

DERIVED CLASS – A class inheriting properties from another class. (Also called SUB CLASS)

## **Chapter 5:User-defined Methods**

1. What is Method? Why do we use method in handling programs?

Ans: A named unit of a group executable statement in a program. This unit can be invoked from other parts of the program.

The advantages of using functions

- a. To cope with complex problems
- b. Hide low level details
- c. To reuse portion of code

2. Define method prototype?

Ans: The method prototype is the first line of the function definition that tells the program about the type of the value returned by the function and the number and types of arguments.

e.g. `void polygon(int x, int y)`  
`public static void main(String [ ]args)`

3. What is method signature?

Ans: A method signature refers to the number and type of arguments. It is a part of the method prototype.

e.g. `maximum(int x, int y)`  
`maximum(char a, char b)`

4. What are the different types of methods in Java?

Ans: Java has two different methods:

a. Instance method

Defined in a class and only accessible through the object of the class. E.g `s1.substring(0,1)`

Instance methods are defined in two ways:

Accessor methods(pure methods) used to read instance variables e.g. get method

Mutator methods(impure methods)used not only to read but also to modify the data.

E.g. set method

b. Class method

Is also known as static method that can be executed without creating an object. They are referred using a classname. E.g. `Math.sqrt`

5. What is the use of void before function name? [2007]

Ans: The void return type specifies an empty set of values and it is used as the return type for functions that do not return a value. Thus a function that does not return a value is declared as follows: `void <functions name> (parameter list)`

6. Explain Functions/Methods Definitions with syntax?

Ans: A function must be defined before it is used anywhere in the program.

```
[access specifier][modifier]return-type function-name (parameter list)
{
body of the function
}
```

where,

[access specifier] can be either Public, Protected or Private.

[modifier] can be one of final, native, synchronize, transient, volatile.

return-type specifies the type of value that the return statement of the function returns. It may be any valid Java data type.

parameter list is comma separated list of variables of a function.

7. Why is main( ) function so special?

Ans: The main( ) function is invoked in the system by default. Hence as soon as the command for execution of the program is used, control directly reaches the main( ) function. It tells the program where to start.

8. Explain the function of a return statement? [2006]

Ans: The return statement is useful in two ways. First an immediately exit from the function is caused as soon as a return statement is encountered and the control back to the main caller. Second use of return statement is that it is used to return a value to the calling code.

9. Difference between Actual argument and Formal argument? [2007,2008]

Ans: The parameter that appears in function call statement is called actual argument and the parameter that appears in function definition is called formal parameter.

E.g. `public void sum(int a, int b) // formal arguments`

.....

`int x=5,y=7;`

`sum(x,y); // actual arguments`

10. What are static members?

Ans: The members that are declared static is called static members. These members are associated with the class itself rather than individual objects, the static members and static methods are often referred to as class variables and methods.

11. What is the use of static in main( ) methods? [2007]

Ans: (i) They can only call other static methods. (ii) They can only access static data. (iii) They cannot refer to *this* or *super* in any way.

12. What is call by value? [2005]

Ans: (i) In call by value, the called function creates its own work copy for the passed parameters and copies the passed values in it. Any changes that take place remain in the work copy and the original data remains intact.

E.g. public static void process(int m)

```
{  
    m=m/10;  
}
```

public static void run()

```
{  
    int z=30;  
    process(z);  
    System.out.println("the result="+z);  
}
```

Output: the result=30

13. Explain the term "passed by reference" [2007]

Ans: In passed by reference, the called function receives the reference to the passed parameters and through this reference, it access the original data. Any changes that take place are reflected in the original data.

14. Differentiate between call by value and call by reference?

Ans: In call by value, the called function creates its own work copy for the passed parameters and copies the passed values in it. Any changes that take place remain in the work copy and the original data remains intact. Only fundamental or primitive are passed.

In call by reference, the called function receives the reference to the passed parameters and through this reference, it access the original data. Any changes that take place are reflected in the original data. Only reference type arguments (objects, arrays) are passed.

15. Define an impure function? [2006]

Ans: Impure Function changes the state of the object arguments they have received and then return. They are also called modifier functions. The following function is the example of an impure function:

```
public static void increment(Time obj, double secs)  
{  
    time.second+=secs;  
}
```

16. What is the difference between pure and impure functions? [2009]

Ans: Pure Function: This function take objects as an argument but does not modify the state of the objects. The result of the pure function is the return value.

Impure Function: These functions change the state of the received object.

17. How are following passed in Java? [2005]

(i) primitive types (ii) reference types

Ans: (i) By value, (ii) By reference.

18. What does function overloading mean? What is its significance?

Ans: A Function name having several definitions in the same scope that are differentiable by the number or type of their arguments, is said to be an overloaded function. Function overloading not only implements polymorphism but also reduces the number of comparisons in a program and thereby makes the programs run faster.

Eg. void prnsqr ( int i )

.....

void prnsqr ( char c )

.....

void prnsqr ( float f )

19. Illustrate the concept of function overloading with the help of an example. [2006]

Ans:- A function name having several definitions that are differentiable by the numbers or types of their arguments is known as function overloading. For example following code overloads a function area to computer areas of circle rectangle and triangle.

```
float area (float radius)          //circle
{
    return (3.14 * radius * radius);
}
float area (float length, float breadth) //rectangle
{
    return (length*breadth);
}
float area (float side1, float side2, float side3) //area of triangle
{
    float s = (side1 + side2 + side3)/2;
    float ar = Math.sqrt(s * (s- side1)*(s-side2) *(s-side3));
    return (ar);
}
```

20. What is this keyword? What is its significance? [2009]

Ans: The this keyword is used to refer to currently calling objects. The member functions of every objects have access to a sort of magic keyword name this, which points to the object itself. Thus any member function can find out the address of the object of which it is a member. The this keyword represents an object that invokes a member function. It stores the address of the object that invoking a member function and it is an implicit argument to the member function being invoked. The this keyword is useful in returning the object of which the function is a member.

## Chapter 4: Constructors

1. What is constructor?

Ans: A constructor is a Member function that is automatically called, when the object is created of that class. It has the same name as that of the class name and its primary job is to initialise the object to a legal value for the class.

2. Why do we need a constructor as a class member? [2007]

Ans: Constructor is used create an instance of a class, this can be also be called as creating an object or instantiating an object.

3. Why should a constructor be defined as public?

Ans: A constructor should be defined in public section of a class, so that its objects can be created in any function.

4. Explain default constructor? [2006]

Ans: The constructor that accepts no parameter is called the default constructor. If we do not explicitly define a constructor for a class, then java creates a default constructor for the class. The default constructor is often sufficient for simple class but not for sophisticated classes.

Example:

```
class ant
{
int i;
public static void main()
ant nc=new ant();
}
```

the line new ant() creates an object and calls the default constructor, without it we have no method to call to build our objects. Once you create a constructor with argument the default constructor becomes hidden.

## 5. Explain the Parameterised constructor?

Ans: If we want to initialise objects with our desired value, we can use parameters with constructor and initialise the data members based on the arguments passed to it. Constructor that can take arguments are called Parameterised constructor.

Example:

```
public class result
{
int per;
int tot;
public result (int percentage)
{
per=percentage;
tot=0;
}
}
```

## 6. Give a syntax/example of constructor overloading. Define a class, which accept roll number and marks of a student. Write constructor for the class, which accepts parameter to initialise the data member. Also take care of the case where the student has not appeared for the test where just the roll number is passed as argument.

Ans: class student

```
{
int roll;
float marks;
student(int r, float m)           // constructor with two argument.
{
roll=r;
marks=m;
}
student(int r)                   // constructor with one argument
{
roll=r;
marks=0;
}
student()                       // default constructor
{
roll=0;
marks=0;
}
}
```

## 7. Mention some characteristics of constructors.



Ans: The special characteristics of constructors are:

(i) Constructors should be declared in the public section of the class. (ii) They are invoked automatically when an object of the class is created. (iii) They do not have any return type and cannot return any values. (iv) Like any other function, they can accept arguments. (v) A class can have more than one constructor. (vi) Default constructor does not accept parameters. (vii) If no constructor is present in the class the compiler provides a default constructor.

8. State the difference between Constructor and Method. [2005]

Ans: The function has a return type like int but the constructor has no return type. The function must be called in programs whereas constructor gets automatically called (is invoked) when the object of that class is created. A constructor has the same name as the class name but a method name is a valid identifier.

9. Enter any two variables through constructor parameters and write a program to swap and print the values. [2005]

```
class swap
{
int a,b;
swap(int x,int y)
{
a=x;
b=y;
}
public void main(String args[])
{
int t=a;
a=b;
b=t;
System.out.out.println("the value of a and b after swaping : "+a+" "+b);
}
}
```

10. What are the types of Constructors used in a class?

Ans: The different types of constructors are as follows:

1. Non parametrised Constructors.
2. Parameterized Constructor.

## Chapter 5: Using Library Classes

1. What are library classes in Java?

Ans: Library classes are pre-defined classes of java which get included in an application program itself and have meaningful instruction to the compiler. Also known as standard java classes or built in classes. They are contained in packages and have their own built in variables, methods and constructors.

2. What are packages? Give two examples. How can you activate the packages in a program?

Ans: Group of logically related classes together is known as package. They are also called Java class libraries where all related functions are pre stored and helps in execution of a program wherever needed.

Eg: java.lang , java.io

Packages are activated using keyword import

Syntax: import package.classname

3. State the use of API.

Ans: Java provides pre-defined classes that are available in Java software known as packages. To run various applications we use group of classes through API( Application Programming Interface).

4. What are wrapper classes?

Ans: Wrapper classes are specially designed classes which are used when the primitive datatypes are needed to be accessed as objects. Wrapper classes are part of java standard library java.lang and convert primitive datatypes in an object.

5. What are the advantages of using Wrapper classes?

Ans: the advantages are:

- Since Java is an object oriented language so the use of objects are necessary. This wrapper class enables primitive values to be used as objects.
- To provide conversion system from character/string type to primitive types.
- It provides ready to use utility methods
- Primitive data types are passed by value and objects by reference. Wrapper class helps primitives to be passed as reference.
- Wrapper classes are final, once assigned cannot be changed. Java ensures uniform capabilities across all instances.

6. State the use of constructor method of the wrapper class with an example.

Ans: The constructor method is used to create objects of that wrapper class.

E.g. Integer intob = new Integer(9);

where, the object intob in an object of Integer class.

7. Explain with an example the conversion of string to integer type of data.

Ans: String n="234";

```
int x= Integer.parseInt(n);
```

```
double y= Double.parse Double(n);
```

the string data 'n' gets converted to integer and double types respectively.

8. What is Autoboxing and Unboxing?

Ans: Autoboxing is used in Java to convert the primitive data type into corresponding objects wrapper class. For e.g. converting an int to Integer, a double to Double.

```
Character ch='a';// autoboxing primitive to object
```

Unboxing converts wrapper class into corresponding primitive data type. It is the reverse of autoboxing.

```
Integer inum= new Integer(5);
```

```
int num=inum; //unboxing object to primitive
```

9. Identify where autoboxing takes place.

```
public class auto_Box
    Integer i= new Integer(10);
    if (i<100)
        System.out.println(i);
    else
        System.out.println(i+10);
```

Ans: Integer i= new Integer(10); //autoboxing

10. Predict the output:

```
double n1= Double.parseDouble("8.0");
double n2= Double.parseDouble("2");
System.out.println(n1+""+n2);
```

Ans: 8.02.0

11. Predict the output:

```
Integer c=155;
Integer d=155;
System.out.println(c=d);
```

```
System.out.println(c.equals(d));
```

Ans: output:

```
155
```

```
true
```

12. Find the error:

```
double n1=Double.parseDouble("2");  
double n2=Double.parseDouble("india");  
System.out.println(n1+" "+n2);
```

Ans: line 2 error message -java.lang.NumberFormatException: for input string : "india" .  
Double type constructor cannot accept string value.

## Chapter 6 : Encapsulation

1. What are access specifiers? Name them

Ans. The access specifier (visibility modifier, access modifier) defines who can use the method or variables. It is a feature of a class. These are keywords put before the declaration of variables and methods. Java provides four access specifiers- public, protected, private and default (friendly).

2. Where can the following members of a class be accessed? private, protected, public and default access. [2008]

Ans: Access specifier can be of following types:

(a) PUBLIC: Public members of a class are globally accessible. Classes, methods and data members can be declared public.

(b) PRIVATE: Private members of a class can be accessed by the member functions of the same class only within which it is defined. Methods and fields can be declared private.

(c) PROTECTED: Protected members of a class are accessible in the package where the class is defined and in all the sub-classes of the class. Methods and fields can be declared protected. Cannot be applied to classes and interfaces.

(d) Default (friendly) access: members with default (friendly) access can be used within the package where the class is defined. We do not declare it explicitly.

3. How are private members different from public member of a class.

Ans: Private members of a class are accessible in the member function of the class only, lowest level of accessibility and private method and variables are not visible within subclasses.

Public members are accessible globally, most open access level and allows the visibility of data members and methods to all classes.

4. How are protected members different from public and private members of a class.

Ans: Protected members of a class are accessible in all the classes in the same package and subclass in the other packages. Private members of a class accessible in the member functions in the class only where as public members are accessible globally.

5. Consider the class:

```
public class Myclass
{
    public static int x=3, y=4;
    public int a=2, b=3;
}
```

i. Name the variables for which each object of the class will have its own distinct copy.

Ans. a and b

ii. Name the variables that are common to all objects of the class.

Ans. x and y

6. What is the scope of the variables? Name the different types.

Ans: The scope of the variables refers to the lifetime and accessibility. Java variables have the following scope- instance variables, class (static variables) and local variables.

7. Differentiate between instance and class variables?

Ans: Instance variables are declared within the class but outside the methods. They are also called data member or field variables. They are created each time with a new value whenever a new object in created. Can be declared private.

Class variables or static variables are declared with the static keyword in a class but outside the methods. Only one copy of this variable is allocated to the memory and each object share it.

8. What are local variables? State the modifiers used? What is the scope of these variables?

Ans: Local variables are declared in a method, constructor or block.

Access modifiers - public, private, protected or default cannot be used with local variables.

Local variables are not visible outside the method, block or constructor

## **Second Terminal Examination-2019-20**

### **Class X**

1. Define String?

Ans: A string is a set of two or more than two characters, a set of characters with the digit or a statement written with in double quotes. e.g. "Our School ", "American English" etc.

2. Write down the purpose of the following string functions: toLowerCase(), toUpperCase(), replace(), trim(), equals(),equalsIgnoreCase(),compareTo(),length(), charAt(), concat(), substring(), indexOf(), lastIndexOf(),startsWith(),endsWith(),valueOf()

Ans: The purpose and syntax of the following string functions are:

toLowerCase(): This function converts all the characters of the string in lower case.

Example:

```
String n="Hello";
```

```
n=n.toLowerCase();
```

```
System.out.println(n);
```

```
hello
```

toUpperCase(): This function converts all the characters of the string in upper case.

Example:

```
String n="hello";  
n=n.toUpperCase();  
System.out.println(n);
```

HELLO

replace(): This function replace all the occurrence of a characters with another one.

```
String n="RAJESH";  
n=n.replace('J','K');  
System.out.println(n);
```

output: RAKESH

trim(): This function is used to remove all the LEADING AND TRAILING white space at the beginning and end of string.

```
String n="  Somalia  ";  
n=n.trim();  
System.out.println(n.length( ));
```

Ans:7

equals(): This function is used to compare two string and give true or false if they are equal.

```
String s1="rama";  
String s2="RAMA";  
System.out.print(s1.equals(s2));    Ans. False
```

length(): This function return the length characters present in the string.

```
String s="school";  
System.out.print(s.length()); Ans:6
```

charAt(): This function return the nth character of the string.

```
String s="cat";  
System.out.print(s.charAt(2)); Ans .t
```

concat(): This function concatenate/join two strings.

```
String s1="OUR ";  
String s2="SCHOOL";
```

System.out.print(s1.concat(s2)); Ans: OURSCHOOL

substring(): This function returns the substring starting from the nth character of the string.

String s="SCHOOL";

System.out.print(s.substring(3)); Ans:OOL

This function also returns the substring starting from the mth character upto the nth character without including the nth character of the string.

String s="ramesh";

System.out.print(s.substring(2,4)); Ans:me

indexOf(): This function returns the position of the first occurrence a character in the string.

String s="Animesh";

System.out.print(s.indexOf('A')); Ans:0

This function also returns the position of the character from the nth position of the string.

String s="COOL";

System.out.print(s.indexOf('C',2)); Ans:2

compareTo(): This function returns negative if first string is less then second string, positive if greater and zero if equals.

String s1="CAT";

String s2="cAT"

System.out.print(s1.compareTo(s2)); Ans: -32

System.out.println(s1.compareToIgnoreCase(s2)); Ans: 0

System.out.println(s1.equals(s2)); Ans false

System.out.println(s1.equalsIgnoreCase(s2)); Ans true

isWhitespace( ):The java.lang.Character.isWhitespace() is an inbuilt method in a java that determines if the specified character (Unicode code point) is white space according to Java. A character is a Java whitespace character if and only if it satisfies one of the following criteria:

It is a Unicode space character (SPACE\_SEPARATOR, LINE\_SEPARATOR, or PARAGRAPH\_SEPARATOR)

It is '\t', U+0009 HORIZONTAL TABULATION.

It is '\n', U+000A LINE FEED.

It is '\u000B', U+000B VERTICAL TABULATION.



It is '\f', U+000C FORM FEED.

It is '\r', U+000D CARRIAGE RETURN.

```
// create 2 char primitives c1, c2
char c1 = '*', c2 = '\f';

boolean b1 = Character.isWhitespace(c1);
boolean b2 = Character.isWhitespace(c2);

String str1 = "c1 is a Java whitespace character is " + b1;
String str2 = "c2 is a Java whitespace character is " + b2;

// print b1, b2 values
System.out.println(str1);
System.out.println(str2);
```

Output:

c1 is a Java whitespace character is true

c2 is a Java whitespace character is false

3. What is the difference between equals() and equalsIgnoreCase() string functions?

Ans: Both the functions is used to compare strings, the difference being that equals() distinguishes between upper case and lower case version of a character, where as equalsIgnoreCase() carries out comparison ignoring the case of characters.

4. Differentiate between equals() and compareTo() methods. [2006]

Ans: Both the functions is used to comparing two strings, the difference being that (i) equals() method only comparing two string and gives they are equal or not, where as compareTo() methods also gives whether first string is greater or smaller then second one. (ii) equals() methods returns a boolean value, where as compareTo() methods return integer value.

5. Differentiate between toLowerCase() and toUpperCase() methods. [2005]

Ans: The given two string method's change the case of the current string. The toLowerCase() method change the current string object to its equivalent Lower Case, where as toUpperCase() method change the current string object to its equivalent Upper Case.

}

6. State the difference between == operator and equals() method. [2008]

Ans: ==: 1. It is a relational operator. 2. it tests the value on the right side with value on the left side.

equals(): 1. It is a string function. 2. It compares two strings and gives the value as true or false.

# Arrays

## 1. How one dimension array is different from double dimension array?

Ans:- One Dimension:- A list of fixed number of homogeneous data elements.

Double Dimension:- An array in which each element itself an array.

## 2. what is meant by index of an element?

Ans:- Index: Also called subscript. The number designating its position in arrays ordering. If there is an array of size N then index number will be from 0 to N-1.

## 3. What do you understand by Arrays? How you declare an Array?

Ans: An Array is a collection of variables of the same data type that are referenced by a common name.

Array can be declared by the following statements: `int n[]=new int[10];`

## 4. What are the different types of arrays?

(i) Single Dimensional Arrays: A list of items can be given one variable name using only one subscript and such a variable is called a single subscripted variable or a one or single dimensional array.

(ii) Two Dimensional Arrays: This type of arrays are actually arrays of arrays.

For e.g: an array `A[M][N]` is an M by N table with M rows and N columns containing  $M \times N$  elements.

## 5. What are the advantages and disadvantages of array.

Ans:- **Advantage of array:-**

i. Since elements of the arrays are stored in contiguous memory locations the sequential access of elements is very fast.

ii. Random access of elements is possible. It is not necessary to access the members sequentially.

**Disadvantage of array:-**

i. One should know the size of the array at the time of declaration.

ii. Once array is declared we cannot change the size of array which sometimes lead unnecessary reservation of memory.

## 6. How can arrays be initialized?

Ans: Array can be initialized at the time of declaration by providing the value list at the same time.

```
int a[]={3,7,8,4,2,2,1,9};
```

## 7. What do you understand by out-of-bound subscripts?

Ans: The subscripts other than 0 to length of the array-1 for an array having n elements are called out-of-bounds subscripts.

## 8. What do you mean by Binary Search?

Ans: This search technique searches the given ITEM in minimum possible compression. The Binary search requires the array must be sorted in any order. The search ITEM is compared with middle element of the array. If the ITEM is more than the middle element later part of the arrays becomes the new array segment. The same process is repeated until either the ITEM is found or the array segment is reduced to a single element.

## 9. Differentiate between linear search and binary search techniques? [2007]

Ans: In linear search each elements of the array is compared with the given item to be searched for one by one while binary search searches for the given item in a sorted array. The search segment reduces to half at every successive stage.

**10.** State the conditions under which Binary Search is applicable?

Ans: For Binary Search the List must be sorted, lower bound upper bound and the sort order of the list must be known.

**11.** What do you mean by sorting?

Ans: Sorting of an array means arranging the array elements in a specified order.

**12.** What is Selection sort?

Ans: In selection sort the smallest ( or largest depending upon the desired order) key from the remaining unsorted array is searched for and put in the sorted array. The process repeats until the entire array is sorted.

**13.** What is Bubble sort?

Ans: In bubble sort the adjoining values are compared and exchanged if they are not in proper order. This process is repeated until the entire array is sorted.

**14.** Which element is num[9] of the array num? [2005]

Ans: 10th element. Because the first index number/subscript value of an array is 0. So 9th element is treated as the 10th element in an array.

## **String Programs**

**Programme :1/\* To display number of blank spaces present in a string\*/**

```
import java.util.*;
class String1
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in));
        String s;
        int i,l,c=0;
        char d;
```

```

System.out.println("Enter a string ");
s=sc.nextLine();
l=s.length();
for(i=0;i<l;i++)
{
    d=s.charAt(i);
    if(d==' ')
    {
        c++;
    }
}
System.out.println("Number of blank spaces are : " +c);
}
}

```

**Programme :2/\* To display number of words present in a string if one blank space will be within the words\*/**

```

import java.util.*;
class String2
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        String s;
        int i,l,c=0;
        char d;
        System.out.println("Enter a string ");
        s=sc.nextLine();
        l=s.length();
        for(i=0;i<l;i++)
        {
            d=s.charAt(i);
            if(d==' ')
            {
                c++;
            }
        }
        System.out.println("Number of words are : " +(c+1));
    }
}

```

**Programme:3/\* To display the words of a string in one column \*/**

```

import java.util.*;
class String3
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        String s,p="";
        int i,l;
        char d;
        System.out.println("Enter a string ");

```

```

s=sc.nextLine();
s=s.trim();
s=s+" ";
l=s.length();
for(i=0;i<l;i++)
{
    d=s.charAt(i);
    if(d!=' ')
    {
        p=p+d;
    }
    else
    {
        System.out.println(p);
        p="";
    }
}
}
}

```

**Programme:4/\* To display the words of a string in one column and length of the word in another column\*/**

```

import java.util.*;
class String4
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        String s,p="";
        int i,l;
        char d;
        System.out.println("Enter a string ");
        s=sc.nextLine();
        s=s.trim();
        s=s+" ";
        l=s.length();
        System.out.println("Word\t\t\tLength");
        for(i=0;i<l;i++)
        {
            d=s.charAt(i);
            if(d!=' ')
            {
                p=p+d;
            }
            else
            {
                System.out.println(p+"\t\t\t"+p.length());
                p="";
            }
        }
    }
}
}

```

**Programme:5/\* To display the words in one column and its last character in another column\*/**

```
import java.util.*;
class String5
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        String s,p="";
        int i,l,w;
        char d;
        System.out.println("Enter a string ");
        s=sc.nextLine();
        s=s.trim();
        s=s+" ";/* so that blank space can be at the end of each word*/
        l=s.length();
        System.out.println("Word\t\t\tLast Character");
        for(i=0;i<l;i++)
        {
            d=s.charAt(i);
            if(d!=' ')
            {
                p=p+d;
            }
            else
            {
                w=p.length();
                System.out.println(p+"\t\t\t"+p.charAt(w-1));
                p="";
            }
        }
    }
}
```

**Programme:6/\* To display the words in one column and its reverse in another column\*/**

```
import java.util.*;
class String6
{
    public static void main(String args[ ])
    {
        Scanner br=new Scanner(System.in);
        String s,p="",q="";
        int i,l;
        char d;
        System.out.println("Enter a string ");
        s=sc.nextLine();
        s=s.trim();
        s=s+" ";/* so that blank space can be at the end of each word*/
        l=s.length();
        System.out.println("Word\t\t\tReverse");
        for(i=0;i<l;i++)
        {
            d=s.charAt(i);
```

```

        if(d!=' ')
        {
            p=p+d;
            q=d+q;
        }
        else
        {
            System.out.println(p+"\t\t"+q);
            p="";q="";
        }
    }
}
}

```

**Programme:7/\* To display the words of string after removing the vowels\*/**

```

import java.util.*;
class String7
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        String s,p="";
        int i,l;
        char d;
        System.out.println("Enter a string ");
        s=sc.nextLine();
        s=s.trim();
        l=s.length();
        for(i=0;i<l;i++)
        {
            d=s.charAt(i);
            if(d=='A'||d=='E'||d=='I'||d=='O'||d=='U'||d=='a'||d=='e'||d=='i'||d=='o'||d=='u')
            {
                continue;
            }
            else
            {
                p=p+d;
            }
        }
        System.out.println("the new string is :"+p);
    }
}

```

**Programme:8/\* To display frequency of each vowel in a word to be given as input \*/**

```

import java.util.*;
class String8
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);

```

```

String s,p="";
int i,l,fa=0,fe=0,fi=0,fo=0,fu=0;
char d;
System.out.println("Enter a string ");
s=sc.nextLine();
s=s.trim();
l=s.length();
for(i=0;i<l;i++)
{
    d=s.charAt(i);
    if(d=='A'||d=='a')
    {
        fa++;
    }
    else if(d=='E'||d=='e')
    {
        fe++;
    }
    else if(d=='I'||d=='i')
    {
        fi++;
    }
    else if(d=='O'||d=='o')
    {
        fo++;
    }
    else if(d=='U'||d=='u')
    {
        fu++;
    }
}
System.out.println("Vowel\t\tFrequency");
System.out.println("A&a\t\t"+fa);
System.out.println("E&e\t\t"+fe);
System.out.println("I&i\t\t"+fi);
System.out.println("O&o\t\t"+fo);
System.out.println("U&u\t\t"+fu);
}
}

```

**Programme:9/\* To display the words of a string in reverse order \*/**

```

import java.util.*;
class String9
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        String s,p="";
        int i,l;
        char d;
        System.out.println("Enter a string ");
        s=sc.nextLine();

```



```

s=s.trim();
s=" "+s;
l=s.length();
for(i=l-1;i>=0;i--)
{
    d=s.charAt(i);
    if(d!=' ')
    {
        p=d+p;
    }
    else
    {
        System.out.print(p+" ");
        p="";
    }
}
}
}

```

**Programme:10/\* To display the palindrome words present in a string \*/**

```

import java.util.*;
class String10
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        String s,p="",q="";
        int i,l;
        char d;
        System.out.println("Enter a string ");
        s=sc.nextLine();
        s=s.trim();
        s=s+" ";
        l=s.length();
        for(i=0;i<l;i++)
        {
            d=s.charAt(i);
            if(d!=' ')
            {
                p=p+d;
                q=d+q;
            }
            else
            {
                if(p.equalsIgnoreCase(q)==true)
                {
                    System.out.print(p+" ");
                }
                p="";q="";
            }
        }
    }
}

```

```
}  
  
Programme:11/* To display a string all in capital letter */
```

```
import java.util.*;  
class String11  
{  
    public static void main(String args[ ])  
    {  
        Scanner sc=new Scanner(System.in);  
        String s,p="";  
        int i,l,as;  
        char d;  
        System.out.println("Enter a string ");  
        s=sc.nextLine();  
        s=s.trim();  
        l=s.length();  
        for(i=0;i<l;i++)  
        {  
            d=s.charAt(i);  
            as=d;  
            if(as>=97 && as<=122)  
            {  
                as-=32;  
            }  
            p=p+(char)as;  
        }  
        System.out.println("the string is : "+p);  
    }  
}
```

**Programme:12/\*\* Write a program to accept a two different characters & display the sum & difference of their ASCII values.**

**Sample i/p: A**

**D**

**Sample o/p: The sum of ASCII values = 165  
The difference of ASCII values =35 \* \*/**

```
import java.util.*;  
class Q1  
{  
    public static void main()  
    {  
        System.out.println("\n");  
        Scanner sc=new Scanner(System.in);  
        System.out.println("Enter a character");  
        char ch1=sc.next().charAt(0);  
        char ch2=sc.next().charAt(0);  
        int a=(int)ch1;  
        int b=(int)ch2;  
        int sum=a+b;  
        int diff=a-b;  
        System.out.println("The sum of ASCII values =" +sum);  
        System.out.println("The difference of ASCII values =" +Math.abs(diff));  
    }  
}
```

```
}
```

**Programme:13/\*\*Write a program to accept a alphabet in upper case or in lower case. Display the next alphabet**

**accordingly. i.e 'a' follows 'b' & 'z' follows 'a' \* \*/**

```
import java.util.*;
class Q2
{
    public static void main()
    {
        System.out.println("\f");
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter a character");
        char ch=sc.next().charAt(0);
        if(ch=='z')
            System.out.println("a");
        else if(ch=='Z')
            System.out.println("A");
        else
            System.out.println(++ch);
    }
}
```

```
}
```

**Programme:14/\*\* \* Write a program to accept a character if it is a letter then display the case i.e lower or upper,**

**otherwise check whether it is digit or special character**

**Sample i/p: p**

**Sample o/p: p is a letter**

**p is in lower case.**

**\* \*/**

```
import java.util.*;
class Q3
{
    public static void main()
    {
        System.out.println("\f");
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter a character");
        char ch = sc.next().charAt(0);
        if(Character.isLetter(ch))
        {
            System.out.println(ch+"is a letter");
            if(Character.isUpperCase(ch))
                System.out.println(ch +" is in upper Case");
            else
                System.out.println(ch +" is in lower Case");
        }
        else if(Character.isDigit(ch))
            System.out.println(ch +" is a digit");
        else
            System.out.println(ch +" is a Special Character");
    }
}
```

```
}
```

**Programme:15/\*\* Write a program in java to accept a string/word and display the new string after removing all the vowels present in it.**

**Sample i/p: COMPUTER APPLICATIONS**

**Sample o/p: CMPTR PPLCTNS \*\*/**

```
import java.util.*;
class Q4
{
    public static void main()
    {
        System.out.println("\f");
        String w="";
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter a String");
        String st=sc.nextLine();
        for(int i=0;i<st.length();i++)
        {
            char x=st.charAt(i);
            if(x!='A' && x!='E' && x!='I' && x!='O' && x!='U' && x!='a' &&
                x!='e' && x!='i' && x!='o' && x!='u')
                w=w+x;
        }
        System.out.println(w);
    }
}
```

**Programme:16/\*\* Write a program to input a word/string, count all the alphabets excluding vowels present in the word/string and display the result.**

**\* Sample i/p: Happy New Year**

**\* Sample o/p: no of alphabets excluding vowels = 8 \*\*/**

```
import java.util.*;
class Q5
{
    public static void main( )
    {
        System.out.println("\f");
        int c=0;
        Scanner sc=new Scanner(System.in);
        System.out.println("enter a string");
        String st=sc.nextLine();
        for(int i=0;i<st.length();i++)
        {
            char x=st.charAt(i);
            if(x!=' ' && x!='A' && x!='E' && x!='I' && x!='O' && x!='U' &&
                x!='a' && x!='e' && x!='i' && x!='o' && x!='u')
                c++;
        }
        System.out.println("no of alphabets excluding vowels = "+c);
    }
}
```

**Programme:17/\*\* Write a program in java to accept a name(containing three word)and display only the initials(i.e first alphabet of each word). display the longest word and the length of the longest word present in the string.**

**Sample i/p: LAL KRISHNA ADVANI**

**Sample o/p: L K A ` \*\*/**

```
Import java.util.*;
class Q6
```

```

{
public static void main()
{
    System.out.println("\n");
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter a String");
    String st=sc.nextLine();
    st=st.trim();
    st=' '+st;
    for(int i=0;i<st.length();i++)
    {
        char x=st.charAt(i);
        if(x==' ')
            System.out.print(st.charAt(i+1)+" ");
    }
}
}

```

**Programme:18/\*\* Write a program in java to accept a name containing three words and display the surname**

**first followed by the first and middle names.**

**Sample i/p: MOHANDAS KARAMCHAND GANDHI**

**Sample o/p: GANDHI MOHANDAS KARAMCHAND \* \*/**

```

import java.util.*;
class Q7
{
public static void main()
{
    System.out.println("\n");
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter a String");
    String st=sc.nextLine();
    st=st.trim();
    int n= st.length();
    int first=st.indexOf(' ');
    int last=st.lastIndexOf(' ');
    st=st.substring(last,n)+' '+st.substring(0,last);
    System.out.println(st);
}
}

```

**Programme:19/\*\* Write a program in java to accept a string/sentence and find the frequency of given alphabets.**

**display the longest word and the length of the longest word present in the string.**

**Sampe i/p: WE ARE LIVING IN COMPUTER WORLD**

**Enter an alphabets whose frequency is to be checked :E**

**Sample o/p: The frequency of 'E' is 3 \* \*/**

```

import java.util.*;
class Q8
{
public static void main()
{
    System.out.println("\n");
    int c=0;
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter a String");

```

```

String st=sc.nextLine();
System.out.println("Enter an alphabets whose frequency is to be checked: ");
char ch=sc.next().charAt(0);
for(int i=0;i<st.length();i++)
{
    char x=st.charAt(i);
    if(x==ch)
        c++;
}
System.out.println("The frequency of "+ch+" is "+c);
}
}

```

## SINGLE DIMENSION:

**Programme :1/\* TO DISPLAY 10 NUMBERS STORED IN AN ARRAY AND ALSO THEIR INDEX POSITION\*/**

```

import java.util.*;
class Sarray1
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        int ar[ ]=new int[10];
        int i;
        System.out.println("Enter 10 numbers");
        for(i=0;i<10;i++)
        {
            ar[i]=sc.nextInt( );
        }
        System.out.println("Numbers\t\tIndex Position");
        for(i=0;i<10;i++)
        {
            System.out.println(ar[i]+" \t\t"+i);
        }
    }
}

```

---

**Programme:2/\* TO DISPLAY 10 NUMBERS IN ONE COLUMN AND THEIR SQUARE IN ANOTHER COLUMN\*/**

```

import java.util.*;
class Sarray2
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);

```

```

int ar[ ]=new int[10];
int i;
System.out.println("Enter 10 numbers");
for(i=0;i<10;i++)
{
    ar[i]=sc.nextInt();
}
System.out.println("Number\t\tSquare");
for(i=0;i<10;i++)
{
    System.out.println(ar[i]+" \t\t"+ar[i]*ar[i]);
}
}
}

```

---

**Programme :3\*** TO DISPLAY ONLY EVEN NUMBERS OUT OF 15 NUMBERS IN ONE ROW AND ALSO DISPLAY TOTAL EVEN NUMBER FOUND \*/

```

import java.util.*;
class Sarray3
{
    public static void main(String args[ ])
    {
        Scanner      sc=new Scanner(new      InputStreamReader(System.in));
        int ar[ ]=new int[15];
        int i,c=0;
        System.out.println("Enter 15 numbers");
        for(i=0;i<15;i++)
        {
            ar[i]=sc.nextInt();
        }
        System.out.println("The even numbers are :");
        for(i=0;i<15;i++)
        {
            if(ar[i]%2==0)
            {
                System.out.print(ar[i]+" ");
                c++;
            }
        }
        System.out.println("\n Total number of evens present are : "+c);
    }
}

```

---

**Programme:4/\*to display numbers of an array in reverse order as per their place\*/**

```

import java.lang.*;
class Sarray4
{
    public static void main(String args[])
    {
        int ar[ ]=new int[9];
        int i, j;
    }
}

```

```

for(i=0,j=19;j>10;i++,j--)
{
    ar[i]=j;
}
System.out.println("The numbers in reverse order are :");
for(i=8;i>=0;i--)
{
    System.out.print(ar[i]+" ");
}
}
}

```

**Programme :5/\* To store 50 numbers in an array and to print number of numbers within a range to be given as input\*/**

```

import java.util.*;
class Sarray5
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        int ar[ ]=new int[15];
        int i,a,b,c=0,lo,ma;
        System.out.println("Enter 50 numbers");
        for(i=0;i<50;i++)
        {
            ar[i]=sc.nextInt( );
        }
        System.out.println("Enter the upper bound and lower bound");
        a= sc.nextInt( );
        b= sc.nextInt( );
        ma=a>b?a:b;
        lo=a<b?a:b;
        for(i=0;i<50;i++)
        {
            if(ar[i]>lo && ar[i]<ma)
            {
                c++;
            }
        }
        if(c==0)
        {
            System.out.println("sorry no numbers within "+lo+" and "+ma);
        }
        else
        {
            System.out.println("there are "+c+" number of numbers");
        }
    }
}

```

---

**Programme :6/\* To store 15 numbers in an array and them in ascending order using selection sorting\*/**



```

import java.util.*;
class Sarray6
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        int ar[ ]=new int[15];
        int i,j,c,min,pmin,dup;
        System.out.println("Enter 50 numbers");
        for(i=0;i<15;i++)
        {
            ar[i]=sc.nextInt( );
        }
        for(i=0;i<14;i++)
        {
            min=ar[i];
            pmin=i;
            for(j=i+1;j<15;j++)
            {
                if(ar[j]<min)
                {
                    min=ar[j];
                    pmin=j;
                }
            }
            dup=ar[i];
            ar[i]=min;
            ar[pmin]=dup;
        }
        System.out.println("The numbers in ascending order are : ");
        for(i=0;i<15;i++)
        {
            System.out.print(ar[i]+" ");
        }
    }
}

```

---

**Programme:7/\* To store 15 numbers in an array and them in ascending order using bubble sorting\*/**

```

import java.util.*;
class Sarray7
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        int ar[ ]=new int[15];
        int i,j,c;
        System.out.println("Enter 15 numbers");
        for(i=0;i<15;i++)
        {

```

```

        ar[i]=sc.nextInt( );
    }
    for(i=0;i<14;i++)
    {
        for(j=0;j<14-i;j++)
        {
            if(ar[j]>ar[j+1])
            {
                c=ar[j];
                ar[j]=ar[j+1];
                ar[j+1]=c;
            }
        }
    }
    System.out.println("The numbers in ascending order are : ");
    for(i=0;i<15;i++)
    {
        System.out.print(ar[i]+" ");
    }
}
}

```

---

Programme :8/\* To store name and mark of 15 students and them display the names sa per their performance in descending order\*/

```

import java.util.*;
class Sarray8
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        String nm[ ]=new String[15];
        int mr[ ]=new int[15];
        int i,j,c;
        String s;
        System.out.println("Enter name and mark of 15 students");
        for(i=0;i<15;i++)
        {
            nm[i]=sc.nextLine();
            mr[i]=sc.nextInt( );
        }
        for(i=0;i<14;i++)
        {
            for(j=0;j<14-i;j++)
            {
                if(mr[j]<mr[j+1])
                {
                    c=mr[j];
                    mr[j]=mr[j+1];
                    mr[j+1]=c;
                    s=nm[j];
                    nm[j]=nm[j+1];

```

```

        nm[j+1]=s;
    }
}
}
System.out.println("The names as per the performance are: ");
for(i=0;i<15;i++)
{
    System.out.println(nm[i]);
}
}
}

```

**Programme :9/\* To store 15 fibonacci numbers in an array and then display in ascending order as well as descending order\*/**

```

class Sarray9
{
    public static void main(String args[ ])
    {
        int ar[]=new int[15];
        int i;
        ar[0]=0;
        ar[1]=1;
        for(i=2;i<15;i++)
        {
            ar[i]=ar[i-1]+ar[i-2];
        }
        System.out.println("The Fibonacci numbers in ascending order are : ");
        for(i=0;i<15;i++)
        {
            System.out.print(ar[i]+" ");
        }

        System.out.println("\n\nThe Fibonacci numbers in descending order are : ");
        for(i=14;i>=0;i--)
        {
            System.out.print(ar[i]+" ");
        }
    }
}

```

**Programme:10/\* To store 15 fibonacci numbers in an array and then display only even fibonacci numbers in descending order and also print how many such numbers found\*/**

```

class Sarray10
{
    public static void main(String args[])
    {
        int ar[ ]=new int[15];
        int i;
        ar[0]=0;
        ar[1]=1;
        for(i=2;i<15;i++)

```

```

    {
        ar[i]=ar[i-1]+ar[i-2];
    }
    System.out.println("\n\nThe even Fibonacci numbers in descending order are : ");
    for(i=14;i>=0;i--)
    {
        if(ar[i]%2==0)
        {
            System.out.print(ar[i]+" ");
        }
    }
}
}

```

**Programme:11/\* To store 20 numbers in an array and then display all zeros if any followed by other numbers without changing their sequence\*/**

```

import java.util.*;
class Sarray11
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        int ar[ ]=new int[20];
        int i,j,c;
        System.out.println("Enter 20 numbers");
        for(i=0;i<20;i++)
        {
            ar[i]=sc.nextInt();
        }
        System.out.println("The numbers are : ");
        for(i=0;i<15;i++)
        {
            if(ar[i]==0)
            {
                System.out.print(ar[i]+" ");
            }
        }
        for(i=0;i<15;i++)
        {
            if(ar[i]!=0)
            {
                System.out.print(ar[i]+" ");
            }
        }
    }
}

```

**Program 12- to search a number in an array using linear search.**

```

import java.util.*;
public class Lsearch
{

```

```

public static void main()
{
    Scanner Sn=new Scanner(System.in));
    int arr[ ]={35,34,67,87,45,33,11,91,2,44,32};
    int n,len,flag,i;
    System.out.println( "enter a number");
    n=Sn.nextInt();
    flag=0;
    len=arr.length;
    for(i=0;i<len;i++)
    {
        if(arr[i]==n)
        {
            flag=1;
            break;
        }
    }
    if(flag==1)
        System.out.println( n+"found at index "+i);
    else
        System.out.println( n+"is not in list");
}
}

```

**Program 13- To search a number in an array using binary search.**

```

import java.util.*;
class lsearch
{
    public static void main()
    {
        Scanner Sn=new Scanner(System.in));
        int a[ ]={34,45,56,67,78,89,90,101,234,345};
        int start,end,mid, n,len,flag;
        System.out.println( "enter a number");
        n=Sn.nextInt();
        flag=0;
        len=a.length;
        start=0;
        end=len-1;
        while(start<=end)
        {
            mid=(start+end)/2;
            if(n==a[mid])
            {
                flag=1;
                break;
            }
            else if(n<a[mid])
                end=mid-1;
            else
                start=mid+1;
        }
        if(flag==1)
    }
}

```

```

        System.out.println( n+"found at index "+mid);
    else
        System.out.println( n+"is not in list");
    }
}

```

#### Program 14- To sort numbers in ascending order using bubble sort technique[2005]

```

import java.util.*;
public class bubbleSort
{
    public static void main()
    {
        int i,j,n;
        int a[] = {72,9,4,99,177,1,7,13,54};
        System.out.println("Values Before the sort:\n");
        for(i = 0; i < a.length; i++)
            System.out.print( a[i]+" ");
        System.out.println();
        n=a.length;
        for(i = 1; i < n; i++)
        {
            for(j = 0; j < (n-i); j++)
            {
                if(a[j] > a[j+1])
                {
                    t = a[j];
                    a[j]=a[j+1];
                    a[j+1]=t;
                }
            }
        }
        System.out.print("Values after the sort:\n");
        for(i = 0; i <a.length; i++)
            System.out.print(a[i]+" ");
    }
}

```

#### Program 15- To sort numbers in ascending order using selection sort technique [2006]

```

Import java.util.*;
public class selectionSort
{
    public static void main()
    {
        int i,j;

```

```

int a[] = {12,9,4,99,120,1,3,10};
System.out.println("Values Before the sort:\n");
for(i = 0; i < a.length; i++)
    System.out.print( a[i]+" ");
System.out.println();
n=a.length;
for(i = 0; i < n; i++)
{
    for(j = i+1; j < n; j++)
    {
        if(a[i] > a[j])
        {
            t = a[j];
            a[j]=a[i];
            a[i]=t;
        }
    }
}
System.out.print("Values after the sort:\n");
for(i = 0; i <a.length; i++)
    System.out.print(a[i]+" ");
}
}

```

## DOUBLE DIMENSION:

**Programme :1/\* To store 12 numbers in a double dimension array and then display those numbers in matrix format\*/**

```

import java.util.*;
class Darray1
{
    public static void main(String args[])throws IOException
    {
        Scanner br=new Scanner(new InputStreamReader(System.in)); int dr[][]=new
int[4][3];
int r,c;
System.out.println("Enter 12 numbers");
for(r=0;r<4;r++)
{
    for(c=0;c<3;c++)
    {
        dr[r][c]=Integer.parseInt(br.readLine());
    }
}
}

```

```
}
System.out.println("The numbers are : ");
for(r=0;r<4;r++)
{
    for(c=0;c<3;c++)
    {
        System.out.print(dr[r][c]+" ");
    }
    System.out.println();
}
}
}
```



**Programme :2/\* To store 20 numbers in a double dimension array and then display only even numbers and their index positions\*/**

```
import java.util.*;
class Darray2
{
    public static void main(String args[])throws IOException
    {
        Scanner br=new Scanner(new InputStreamReader(System.in)); int dr[][]=new
        int[4][5];
        int r,c;
        System.out.println("Enter 20 numbers");
        for(r=0;r<4;r++)
        {
            for(c=0;c<5;c++)
            {
                dr[r][c]=Integer.parseInt(br.readLine());
            }
        }
        System.out.println("numbers\trow\tcolumn ");
        for(r=0;r<4;r++)
        {
            for(c=0;c<5;c++)
            {
                if(dr[r][c]%2==0)
                {
                    System.out.println(dr[r][c]+"\\t"+r+"\\t"+c+"\\t");
                }
            }
        }
    }
}
```

**Programme:3/\* To store 20 numbers in a double dimension array and then display the original array and also display its transpose\*/**

```
import java.util.*;
class Darray3
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        int dr[ ][ ]=new int[4][5];
        int r,c;
        System.out.println("Enter 20 numbers");
        for(r=0;r<4;r++)
        {
            for(c=0;c<5;c++)
            {
                dr[r][c]=sc.nextInt( );
            }
        }
    }
}
```

```

    }
}
System.out.println("the original matrix is : ");
for(r=0;r<4;r++)
{
    for(c=0;c<5;c++)
    {
        System.out.print(dr[r][c]+"\\t");
    }
    System.out.println();
}
System.out.println("the transepose matrix is : ");
for(c=0;c<5;c++)
{
    for(r=0;r<4;r++)
    {
        System.out.print(dr[r][c]+"\\t");
    }
    System.out.println();
}
}
}
}

```

**Programme :4/\* To store 20 numbers in a double dimension array and then display the original array and thier square after keeping in another array\*/**

```

import java.util.*;
class Darray4
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        int dr[ ][ ]=new int[4][5];
        int sr[ ][ ]=new int[4][5];
        int r,c;
        System.out.println("Enter 20 numbers");
        for(r=0;r<4;r++)
        {
            for(c=0;c<5;c++)
            {
                dr[r][c]=sc.nextInt()
            }
        }
        for(r=0;r<4;r++)
        {
            for(c=0;c<5;c++)
            {
                sr[r][c]=dr[r][c]*dr[r][c];
            }
        }

        System.out.println("the original matrix is : ");
        for(r=0;r<4;r++)

```

```

    {
        for(c=0;c<5;c++)
        {
            System.out.print(dr[r][c]+"\\t");
        }
        System.out.println();
    }
    System.out.println("the square matrix is : ");
    for(r=0;r<4;r++)
    {
        for(c=0;c<5;c++)
        {
            System.out.print(sr[r][c]+"\\t");
        }
        System.out.println();
    }
}
}
}

```

**Programme :5/\* To store 25 numbers in a double dimension array and then display the diagonals in two different lines with appropriate message\*/**

```

import java.util.*;
class Darray5
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        int dr[ ][ ]=new int[5][5];
        int r,c;
        System.out.println("Enter 25 numbers");
        for(r=0;r<5;r++)
        {
            for(c=0;c<5;c++)
            {
                dr[r][c]=sc.nextInt();
            }
        }

        System.out.println("the values of left diagonal is : ");
        for(r=0;r<5;r++)
        {
            for(c=0;c<5;c++)
            {
                if(r==c)
                {
                    System.out.print(dr[r][c]+" ");
                }
            }
        }
        System.out.println("\\nthe values of right diagonal is : ");
        for(r=0;r<5;r++)
    }
}

```

```

{
    for(c=0;c<5;c++)
    {
        if(r+c==4)
        {
            System.out.print(dr[r][c]+" ");
        }
    }
}

```

```

}
}

```

**Programme :6/\* To store 16 numbers in a double dimension array and then display the same matrix with a condition that left diagonal all values to be divisible by 2 and right diagonal by 3 if not to be shifted to next nearest number divisible\*/**

```

Import java.util.*;
class Darray6
{
    public static void main(String args[ ])
    {
        Scanner br=new Scanner(System.in);
        int dr[ ][ ]=new int[4][4];
        int r,c;
        System.out.println("Enter 16 numbers");
        for(r=0;r<4;r++)
        {
            for(c=0;c<4;c++)
            {
                dr[r][c]=sc.nextInt( );
            }
        }

        for(r=0;r<4;r++)
        {
            for(c=0;c<4;c++)
            {
                if(r==c && dr[r][c]%2!=0)
                {
                    dr[r][c]=dr[r][c]+1;
                }
                else if(r+c==3&&dr[r][c]%3!=0)
                {
                    dr[r][c]=dr[r][c]+(3-dr[r][c]%3);
                }
            }
        }
        System.out.println("\nthe changed matrix is : ");
        for(r=0;r<4;r++)
        {
            for(c=0;c<4;c++)

```

```

        {
            System.out.print(dr[r][c]+"\\t");
        }
        System.out.println();
    }
}
}

```

**Programme :7/\* To store 16 numbers in a double dimension array and then display sum of each row with appropriate message\*/**

```

import java.util.*;
class Darray7
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        int dr[ ][ ]=new int[4][4];
        int r,c,s;
        System.out.println("Enter 16 numbers");
        for(r=0;r<4;r++)
        {
            for(c=0;c<4;c++)
            {
                dr[r][c]=sc.nextInt( );
            }
        }

        for(r=0;r<4;r++)
        { s=0;
            for(c=0;c<4;c++)
            {
                s+=dr[r][c];
            }
            System.out.println("The sum of "+(r+1)+" row is : "+s);
        }
    }
}

```

**Programme:8/\* To store 16 numbers in a double dimension array and then display maximum of each row with appropriate message and also maximum of the matrix\*/**

```

import java.util.*;
class Darray8
{
    public static void main(String args[ ])
    {
        Scanner br=new Scanner(System.in);
        int dr[ ][ ]=new int[4][4];
        int r,c,m,mm;
        System.out.println("Enter 16 numbers");
        for(r=0;r<4;r++)

```

```

    {
        for(c=0;c<4;c++)
        {
            dr[r][c]=sc.nextInt( );
        }
    }
    mm=dr[0][0] ;
    for(r=0;r<4;r++)
    { m=dr[r][0];
        for(c=1;c<4;c++)
        {
            if(dr[r][c]>m)
            {
                m=dr[r][c];
            }
        }
        System.out.println("The maximum of "+(r+1)+" row is : "+m);
        if(m>mm)
        {
            mm=m;
        }
    }
}

System.out.println("The maximum number of the matrix is :"+mm);
}
}

```

**Programme :9/\* To add two matrix of 4X5 order and display resultant matrix\*/**

```

import java.util.*;
class Darray9
{
    public static void main(String args[ ])
    {
        Scanner sc=new Scanner(System.in);
        int dr[ ][ ]=new int[4][5];
        int sr[ ][ ]=new int[4][5];
        int ar[ ][ ]=new int[4][5];
        int r,c;
        System.out.println("Enter 20 numbers in first matrix ");
        for(r=0;r<4;r++)
        {
            for(c=0;c<5;c++)
            {
                dr[r][c]=sc.nextInt( );
            }
        }
        System.out.println("Enter 20 numbers in second matrix ");
        for(r=0;r<4;r++)
        {
            for(c=0;c<5;c++)
            {

```

```

        sr[r][c]=sc.nextInt( );
    }
}

for(r=0;r<4;r++)
{
    for(c=0;c<5;c++)
    {
        ar[r][c]= dr[r][c]+ sr[r][c];
    }
}
System.out.println("resultant matrix is : ");

for(r=0;r<4;r++)
{
    for(c=0;c<5;c++)
    {
        System.out.print(ar[r][c]+"");
    }
    System.out.println();
}
}
}

```

**Programme :10/\* To add two matrix of 4X5 order and display resultant matrix\*/**

```

import java.util.*;
class Darray10
{
    public static void main(String args[ ])
    {
        Scanner br=new Scanner(System.in);
        int dr[ ][ ]=new int[4][5];
        int sr[ ][ ]=new int[4][5];
        int ar[ ][ ]=new int[4][5];
        int r,c;
        System.out.println("Enter 20 numbers in first matrix ");
        for(r=0;r<4;r++)
        {
            for(c=0;c<5;c++)
            {
                dr[r][c]=sc.nextInt( );
            }
        }
        System.out.println("Enter 20 numbers in second matrix ");
        for(r=0;r<4;r++)
        {
            for(c=0;c<5;c++)
            {
                sr[r][c]=sc.nextInt( );
            }
        }
    }
}

```

```

for(r=0;r<4;r++)
{
    for(c=0;c<5;c++)
    {
        ar[r][c]= dr[r][c]+ sr[r][c];
    }
}
System.out.println("resultant matrix is : ");

for(r=0;r<4;r++)
{
    for(c=0;c<5;c++)
    {
        System.out.print(ar[r][c]+"\\t");
    }
    System.out.println();
}
}
}

```

## **CONCEPT BASED THEORY QUESTIONS:**

1. What is the use of a computer language? Give some examples.
2. Write the limitations of Machine Level Language.
3. What is the use of a Translator?
4. What is source code?
5. What is debugging?
6. What is an error? What are the types of error?
7. Explain one line each about different types of error?
8. What is OOPs? Write two lines about it.
9. what are the benefits of OOPs:
10. Write down the principles of OOPs.
11. What are the basic concepts of OOPs.
12. What are the application area of OOPs?
13. What is Encapsulation? Explain how it is implemented in Java?
14. What is data abstraction?
15. Write the extention of file of source code, byte code and machine code generated in Java.
16. What is Polymorphism? How it is used in Java?
17. What is Inheritance? Write the keyword used to implement inheritance in Java.
18. Write two benefits of inheritance?
19. What is Base class and what is derived class?
20. What is a class in Java? Write the elements of a class?
21. What is attribute of an object? Write some examples.
22. What are three parts of an attribute?
23. What is behaviour of an object?
24. What are the parts of a behaviour?
25. What is an object? Write some real life examples of object?
26. How an object is related to class?
27. Why class is called object factory?
28. What do you mean by instantiating objects?
29. Which operator is used to access member of a class?
30. What is Java ? Write some features/characteristics of Java?
31. Write the steps of java compilation process.
32. Write different application area of Java?
33. Why java is suitable for Internet?
34. What is JDK?
35. Why Java is called as WORA Language?



36. What is Multi-threading? How it is related to Java?
37. Write few lines about garbage collection feature of java?(OR) What is GIGO? Write few lines about it?
38. "Java is portable": Explain?
39. "Java is Robust ":Explain it in one line.
40. What is IDE? Give one example of it.
41. What is API? Give one example of it.
42. What is BlueJ? Write few lines about it.
43. What is an attribute? Explain with example.
44. What is meant by message passing?
45. What is JIT?
46. What is Bytecode? What is it's work?
47. What is access specifier? Give some examples.
48. What is access modifier? Give one example of it.

## **PROGRAM BASED THEORY QUESTIONS:**

1. What is the use of remark statement? Give an example.
2. What is Package? Give some examples of system package?
3. What is wrapper class? Write some examples.
4. Write the keyword used for creation of package? Give an example.
5. What is the use of import keyword?
6. What is the use of " \* " in package activation?
7. What is Unicode?
8. What does System.in indicate ?
9. What does System.out indicates?
10. What is the use of String args[] ?
11. What is Token? Give some examples.
12. What is keyword? How many keywords are there in java?
13. What is constant? Write different types of constant used in Java.
14. What is escape sequence? Give some examples.
15. What is Identifier? Give some examples.
16. Write the rules for identifier?
17. What is variable? What is essential to create variable?
18. What is data type? Write the types?
19. What is naming convention?
20. What is operator? What is it's use?
21. What is operand?
22. What is Unary operator? Give some examples it.
23. What is an expression? Give one example?
24. What is pure expression? Give an example.
25. What is mixed expression? Give an example?
26. What is the use of assignment operator?
27. What is conditional operator? Give one example.
28. What is Type conversion? What are it's type?
29. What is automatic type conversion? Write the rules for conversion?
30. What is explicit conversion? Give an example?
31. Explain the use of readLine( ) method?
32. What is the use of parseInt( ) method?
33. Explain compound statement with example.
34. Explain the use of default in switch case
35. Why break is used in switch case
36. What are the uses of break statement.
37. What is the use of continue statement?
38. What is the use of return statement?
39. Explain the scope of a variable?
40. What is method and how it is related to class and object?
41. What is the use of "this" keyword?
42. What do you mean by constructor overloading?

43. What is method overloading?
44. What is method prototype?
45. Write the parts of method prototype?
46. What is composite data type?
47. What is control statements?
48. What is counter variable?
49. What is operator precedence?
50. What is the use of new keyword?

## **DIFFERENCES:**

1. Source Code and Object Code
2. Unicode Code and Byte Code
3. Interpreter and Compiler
4. Machine Level Language and High Level Language
5. .java and .class
6. JDK and BlueJ
7. BlueJ and JVM
8. class and object
9. Access Specifier and Access Modifier
10. Attribute of an Object and Behavior of an Object
11. System.in and System.out
12. Constants and Variables
13. Naming Rule and Naming Conventions
14. Operator and Operand
15. Unary and Binary Operator
16. Postfix and Prefix
17. Keyword and constant
18. = and ==
19. "123" and 123
20. a++ and a+1
21. Implicit and Explicit Conversion
22. Primitive data type and referential data type
23. Data type and variable
24. Operator precedence and data type precedence
25. boolean and Boolean
26. short and int
27. break and continue
28. break and return
29. if else and switch case
30. while loop and do while loop
31. print( ) and println( )
32. pure method and impure method
33. argument and parameter
34. primitive and referential data type
35. method and constructor
36. non parametrised constructor and parametrised constructor
37. sorting and searching
38. selection sort and bubble sort

39. linear search and binary search
40. Rvalue and Lvalue
41. call by value and call by reference
42. Static variable and instance variable and local variable
43. Static method and instance method
44. Syntax error and runtime error and logical error
45. charAt() and indexOf()
46. next() and nextLine()
47. toUpperCase of Character class and toUpperCase() of String class
48. toUpperCase() and isUpperCase() of Character class
49. indexOf() and lastIndexOf()
50. SDA and DDA

## Questions & Answers

1. What is the use of a computer language? Give some examples.

**Ans:**

Language is a medium of communication. A computer language is a medium of communication between man and machine. It is used to design software which will help to control the computer hardware.

Some examples are c, c++, java etc.

2. Write the limitations of Machine Level Language.

**Ans:**

Limitations of MLL are:

- Very difficult to write, because it uses only two symbols i.e. 0 and 1
- Very difficult to debug, because any change in a programme will force to write the entire programme again.
- Machine dependant means it can only work in the computer where it is designed.

3. What is the use of Translator?

**Ans:**

It is a type of software which helps to convert source code written in any HLL to its equivalent Machine code.

There are three types of translator such as

- Assembler
- Interpreter and
- compiler

4. What is source code?

**Ans:**

It is the code generated by using high level language.

It is human understandable code which is developed by the user.

5. What is debugging?

**Ans:**

It means rectification of error.

It is the essential part of a development of software.

6. What is error? What are the type of errors?

**Ans:**

Error means any type of mistake that occurs in a program. Error can be of three types, such as

- **Syntax error** which occurs due to grammatical mistake.

- **Runtime error** which occurs due to wrong input.
- **Logical error** which occurs by getting wrong output.

7. Explain one one line about different types of errors?

Ans:

Depending upon the nature and stage of occurrence, there are three types of errors such as

**Syntax error:** It is also called grammatical error which is occurred during compilation.

**Runtime error:** It is also called execution error which is occurred during execution due to wrong input.

**Logical error:** It is also called output error which is occurred due to unexpected output.

8. What is OOPs? Write two lines about it.

Ans:

It stands for object oriented programming structure. It is a modern approach to design a software where more priority is given to object, which is treated as the basic element of OOPs programming.

9. Write some features of OOPS language.

Ans:

Features of OOPS are as follows:

- It emphasizes on **data** rather than procedure.
- Programme is divided into small elements called **object**.
- Follows **bottom – up** approach in programme designing.
- It tries to keep state and behaviour of an object in a single unit called class.

10. what are the benefits of OOPs:

Ans:

The principal advantages of OOPs are as follows:

- through inheritance it is possible to extend the use the code of existing class and redundancy of code can be avoided.
- Data hiding concept helps to build secure programme.
- It is possible to map the object in the problem.
- Software complexity can be easily managed.

11. Write down the principles of OOPs.

Ans:

OOPs is based on following three pillars, such as

- Encapsulation
- Polymorphism
- Inheritance

12. What are the basic concepts of OOPs.

Ans:

OOPs is based on there pillars.

- Encapsulation
- Polymorphism
- Inheritance

13. What are the advantages of OOPs?

Ans:

- Gives emphasis on the data than the procedure.
- The data and functions are kept in a single unit called class
- It is possible to modify data without changing any method.
- Fully secured and protected.

14. What are the application area of OOPs?

Ans:

- Real-time systems
- Object-oriented database
- Office automaton system
- CAD system.

15. What is Encapsulation? Explain how it is implemented in Java?

Ans:

**Wrapping up of data and method that operate on the data into a single unit is called encapsulation.**

It helps to implement the concept of data abstraction and data hiding through following keywords :

public, private and protected

16. What is data abstraction?

Ans:

Abstraction refers to **the act of representing essential features without including the background details or explanations**. It can be implemented through the access specifiers like public, private and protected.

17. What is Polymorphism? How is it used in Java?

Ans:

Poly means **more** Morphism means **use**. It is the ability or data to be processed in more than one form. It can be used through method overloading and constructor overloading.

18. What is Inheritance? Write the keyword used to implement inheritance in Java.

Ans:

It is the process by which one class acquires the properties of other class. It supports the concept of hierarchical classification. It helps to reuse the code of one class in the definition of other class. **“extends”** keyword is used to implement inheritance.

19. Write two benefits of inheritance?

Ans:

Benefits of inheritance are as follows:

- Re-usability.
- Establishing relationship with the class

20. What is Base class and what is derived class?

Ans:

- A derived class or subclass is a class that inherits the properties from a class.
- A base class is a class whose properties are inherited by derived class.
- A derived class is the extended part of the base class.

21. What is a class in Java? Write the elements of a class?

Ans:

A class represents a set of objects that share common characteristics and behaviour. It can be called as a blueprint or frame that defines similar type of objects.

A class consists of two important elements such as:

- Member Data representing the state or attribute of an object.
- Member Method representing the behavior of an object.

22. What is attribute of an object? Write some examples.

Ans:

An attribute represents the state of an object.

In a class, it is kept in the form of member data to store some value of an object.

Some examples are: Name, age, dept, salary etc.

It is, therefore, kept in a class in the form of field.

23. What are three parts of an attribute?

Ans: Following are three parts of an attribute, such as

- a) Access Specifier: tells the scope of an attribute which can be public, private or protected. If no access specifier is given then it takes default as a specifier.
- b) Data type: occupies memory as per the type of values to be kept.
- c) Name of the attribute: recognizes the memory.

24. What is behaviour of an object?

Ans:

Behavior of an object means the activities to be performed.

It is represented by the member methods.

Number of member methods in a class depends on the number of tasks to be performed in an object.

25. What are the parts of a behaviour?

Ans: The parts of a method are as follows:

- a. Access specifier
- b. Access modifier
- c. Return type
- d. Method name
- e. Signature/Parameter list

26. What is object? Write some real life examples of object?

Ans:

**An object is an identifiable entity having its own characteristics and behaviours.**

Some examples of real objects are : car,house,books etc.

Therefore, it implies all physical entity having shape and occupies some space.

27. What are the features of the object?

Ans:

There are **four** important features of an object such as :

- **Identity**:An unique way of referring an object such as name of the class.
- **State/Characteristics/attributes**: The properties of an object such as name,age,height,weight etc of a person.
- **Behaviour**:The activities to be performed associated with an object.
- **Change in State**: It occurs when some method is applied on an object.

28. How an object is related to class?

Ans:

A class is a blueprint or frame of an object and where as an object is the instance or end product of a class. A class is called as object factory which defines the state and behavior of an object and an object is the final product of a class..

29. Why class is called object factory?

Ans:

A class is a blueprint which defines the attribute and behavior of an object.

It helps to create number of objects of similar type as per the requirement.

As a producer of object ,it can be called as object factory.

30. What do you mean by instantiating objects?

Ans:

The process of creating objects is called instantiating objects.

An instantiation is done through a keyword called **new**.

For example: if A is the name of class then the object can be created as follows:

A mm=new A( );

Where mm is called as referential variable which keeps the address of the object created.

31. Which operator is used to access member of a class?

Ans: A class consists of two important elements such as:

- a. Member Data representing the state or attribute of an object.
- b. Member Method representing the behavior of an object.

The dot( . ) operator is used to access the members of a class.

For example:

mm.add( );

here, the member method add( ) is called through the referential variable called mm.

32. What is Java ? Write some features/characteristics of Java?

Ans:

Java is the most advanced high level language which helps to design real life program.

The features of java are as follows:

- Simple
- WORA(Write Once Run Anywhere)
- Object Oriented Language.
- Platform independent.
- Robust.
- Secure
- Multithreading
- Internet based language.

33. Write few lines about the history of java?

Ans:

Java is a general purpose object oriented language developed by Sun Microsyatem of USA in the year 1991.

It was originally called as OAK by James Gosling one of the leading inventor of this language.

34. Write different application area of Java?

Ans:

Java can be used in following three different ways such as

- Standalone program : Program based on general application
- Applet:Application program based on internet
- Servlet: Server based program

35. Why java is suitable for Internet ?

Ans:

Java is suitable for Internet because of following two reasons:

- It is system independent, hence its programme can run in any type of computer.
- It eliminates lot of security problems for data transfer.

36. What is JDK?

Ans:

It stands for Java Development Kit.

It is a software which provides a platform to design java program.

It is otherwise known as J2SDK.

37. Why Java is called as WORA Language?

Ans:

It stands for Write Once and Run Anywhere.

Java is called as WORA language, because it is platform independent and the code generated in one computer can be executed in any environment.

38. What is Multi-threading? How it is related to Java?

Ans:

Thread means task and multi-thread means multiple work to be performed simultaneously.

Java supports the concept of multi-threading.

39. Write few lines about garbage collection feature of java?

(OR) What is GIGO? Write few lines about it?

Ans:

GIGO stands for Garbage In Garbage Out. It is a feature of java, where a software will be activated at the time of shortage of space. At the time of any shortage of memory, this software gets activated and tries to release some unused memory and allots the same to other variables.

40. "Java is portable": Explain?

Ans:

The above statement is true because it yields program that can be run on any platform.

This feature of java is also called as WORA, i.e. Write Once and Run Anywhere.

41. "Java is Robust": Explain it in one line.

Ans:

It means simple and reliable.

It is because of the exception handling and gigo feature of java.

42. What is IDE? Give one example of it.

Ans:

It stands for Integrated Development Environment. It is a software which provides platform to develop java programming. Example of IDE is J2SDK.

43. What is API? Give one example of it.

Ans:

It stands for Application Programming Interface.

It is a collection of packages which helps user to design java program.

Examples are :java.lang,java.awt,java.lang.

44. What is BlueJ? Write few lines about it.

Ans:

It is a window based software which acts as an editor and plays as an interface between user and computer. It performs following task:

- To write and edit java program.
- To convert source code to byte code.
- Saves the java code.

45. What is an attribute? Explain with example.

Ans:

The member elements of a class to keep data are called attribute of a class.

46. What is meant by message passing?

Ans:

Objects can interact each other by passing information in the form of arguments through methods.

This technique is known as message passing.

47. What is JIT?

Ans:

It stands for Just In Time.

It is a compiler which is a part of JVM helps to increase the speed of execution of a Java programme.

48. What is Bytecode? What is its work?

Ans:

It is a byte long instruction which acts as an intermediately code generated by java compiler and will be converted to machine code by java interpreter.

49. What is access specifier? Give some examples.

Ans:

As the name indicates , it specifies the accessibility of a member of a class.

It determines the scope of operation of a member of a class.

There are three type of access specifier such as public, private and protected.

50. What is access modifier? Give one example of it.

Ans:

It controls the internal scope of a member.

A member can either be instance or static in nature.

In case of instance, it gets activated and accessed by the object only.

In case of static, it can be used directly through class name or through any object.

## Programme based theory:

51. What is the use of remark statement? Give an example.

Ans:

It is a non- executable statement which helps to give information about the programme and the programmer. There are three different way to give remark statement in a programme, such as

// for single line

/\* -----\*/ for multiple line

/\*\* -----\*/ for documentation.

It can be placed anywhere within the programme.

52. What is Package? Give some examples of system package?

Ans:

Package is a collection of classes within which keywords are defined. There are two types packages such as System package and user-defined package. Examples of system packages are lang,io,awt,appletviewer.

53. What is wrapper class? Write some examples.

Ans:

It is a collection of system classes where primitive data type are defined. For example, Integer class where int is defined, Characher class where char is defined etc.

54. Write the keyword used for creation of package? Give an example.

Ans:

A package is created by the keyword "package". For example :

**package package name;**

55. What is the use of import keyword?

Ans:

It helps to activate the package.

It makes the JVM to go to the Java standard library, execute the code there and substitute the result into the programme.

It is a single line statement which must be ended with ;

For example: import java.util.\*;

56. What is the use of " \* " in package activation?

Ans:

\* indicates all classes and methods present in a package will be activated.

It is used at the time of activation of the package.

57. What is Unicode?

Ans:

It is a two byte character set of java used to write java source code.

There are 65,536 symbols used in this coding system.

It makes the language universal because it includes symbols of several modern countries.



58. What does System.in indicate ?

Ans:

It is used as an argument to activate the InputStreamReader class of io package.

It represents InputStream object which is by default standard input device i.e. keyboard.

59. What does System.out indicates?

Ans:

It is used to call print( ) method in a programme.

It represents PrintStream object which is by default the system output device i.e. monitor.

60. What is the use of String args[] ?

Ans:

It is use as a parameter list of main method which is called as command line argument.

args[] is a string array which will store all the arguments received from the command line to main methods.

But all will be treated as string type which can be used in any form in the main method.

61. What is Token? Give some examples.

Ans:

It is the smallest individual unit of a programme which has its own identity.

There are five types of token such as keyword, constants, identifier, operators and separators,

62. What is keyword? How many keywords are there in java?

Ans:

It is a reserve word which conveys a special meaning to the compiler.

Keywords are used to write instructions.

There are 50 keywords used in java.

63. What is constant? Write different types of constant used in Java.

Ans:

It a type of token which does not change its worth or value during the execution of a program.

There are two types of constants such as Numeric and Non-numeric.

64. What is escape sequence? Give some examples.

Ans:

It is a non-graphic character which is used in print statement in order to get some special effect in output.

Some examples of escape sequences are : \n ,\t , \a etc.

It is a character constant which can be kept in single quote.

65. What is Identifier? Give some examples.

Ans:

It is a part of a programme which helps to identify a block or memory.

Examples of identifier are variable name , class name or method name etc.

66. Write the rules for identifier?

Ans:

Rules are as follows:

- Valid symbols are A to Z, a to z, 0 to 9 , \$ and \_(under score)
- Digit cannot be in the first place.
- It is case sensitive.
- Keywords cannot be used as identifier.
- It can be of any length.

67. What is variable? What is essential to create variable?

Ans: It represents memory in RAM to store constants.

A variable is essential in a programme to deal with unknown constants.

It can be created by data type.

68. What is data type? Write the types?

Ans:

It is a keyword which helps following two tasks.

- Allocates memory in RAM and gives name to it.
- Specifies the type of constant to be kept.

69. What is naming convension?

Ans:

It a process by which names given to identifiers can be distinguished.

It is not a rule, so any deviation in it will not be an error.

Following table tells about the convention of the identifier:

Class name	First letter of each word capital	SelectionSort
Method name	First letter of subsequent word capital followed by ( )	getArray()
Variable name	First letter of subsequent word capital	myAge
Constant name	All letters capital, each word separated by underscore	MAX_VALUE, MIN_VALUE

70. What is operator? What is its use?

Ans:

It is a symbol which is used to perform arithmetic and logical operations.

These symbols act on variables or constants to form an expression.

Examples of operators are : + \* % = ++ etc.

71. What is operand?

Ans:

An operator acts on some constants or variables which are called operands.

As mentioned above an operand either can be a constant or a variable.

72. What is Unary operator? Give some examples of it.

Ans:

It is a type of operator which works on only one operand.

Examples: ++ -- !

73. What is an expression? Give one example?

Ans:

It is a legal collection of operands and operators in a logical sequence.

Example:  $a = b * 10 / c$ ;

Here, a, b, c and 10 are called operands and \* and / are called operators.

There are two types of expressions such as pure and mixed expressions.

74. What is a pure expression? Give an example.

Ans:

If all the operands of the expression are of the same type then it will be called as a pure expression.

Example:  $r = a + b * c / d$ ; where all variables are of int type.

75. What is a mixed expression? Give an example?

Ans:

If all the operands of the expression are not of the same type then it will be called as a mixed expression.

Example:  $r = m - n / p$ ; where variables are of different data types.

76. What is the use of the assignment operator?

Ans:

It is a type of operator which helps to store the value of the right side in the left side variable.

Example:  $a = 10$ ;  $b = a$ ;  $c = b + 10$ ;

77. What is a conditional operator? Give one example.

Ans:

It is an example of a ternary operator which helps to perform some work based on a condition.

It is called a ternary operator because it takes three operands to perform the work.

Example:  $c = (a > b) ? a : b$ ; Here, the condition will be checked, if it is true then a will be stored in c otherwise b will be stored. Always, it is not essential to take a third variable.

Example:  $(a > b) ? \text{System.out.println}(a) : \text{System.out.println}(b)$ ;

78. What is type conversion? What are its types?

Ans:

The process of converting one primitive data type to another is called type conversion.

There are two forms of type conversions, such as

- Implicit conversion
- Explicit conversion

79. What is automatic type conversion? Write the rules for conversion?

Ans:

The conversion which takes place by the compiler is called automatic conversion.

Here, lower type is converted to higher type.

That is why these are called 'widening promotion' or coercion.

The promotions are done in the following order:

- a) An expression involving byte, short, char and int are automatically promoted to int.
- b) If one operand is long, whole expression is promoted to long.
- c) If one operand is float, whole expression is promoted to float.
- d) If one operand is double, whole expression is promoted to double.

80. What is explicit conversion? Give an example?

Ans:

The conversion which takes place during execution of a programme is called explicit conversion.

It is a user defined that forces to a specific type .

Here, the higher type can be converted to any lower type.

Syntax:

Datatype var=(datatype) expression;

81. Explain compound statement with example.

Ans:

Collection of more than one instruction within a single block surrounded by curly brackets is called as compound statement.

Example:

Class is a compound statement.

Method is a compound statement etc.

82. Explain the use of default in switch case

Ans:

It is a block present in a switch block which will be activated automatically if none of the case block match with the switch variable.

It is basically used to give error message.

It can be placed anywhere within the switch block.

83. Why break is used in switch case

Ans:

It is a keyword which is used after the end of each case block.

After the end of any case block, it helps to move the control to outside the switch block as such restricts to move to any further case block.

It is not mandatory but as per the logic it is to be given.

84. What are the uses of break statement.

Ans:

Break statement can be used in three ways:

- It is used inside the loop to come out of it.
- It is used inside the case block to come out of the switch block.
- It is used as labeled break within any nested loop to come out of any of the loop.

85. What is the use of continue statement?

Ans:

It is used only within the loop to proceed to the next iteration leaving all the subsequent instructions.

It can also be used along with a label.

Example: continue; continue label;

86. What is the use of return statement?

Ans:

It is a jumping statement which helps to send the control from the called method to calling method.

While the control returns , it brings some values to the calling method.

Example: return 1; return a; return a+10; etc.

But it must be kept in mind that the return statement must be the last executable instruction of the method.

87. Explain the scope of a variable?

Ans:

The scope of a variable means the area within which the variable can be used.

For example a variable created within a block only will be used within the same block.

88. What is method and how it is related to class and object?

Ans:

It is a block which carries instructions to perform certain task.

It is treated as the state of an object.

It is called the member method of a class.

89. What is the use of “this” keyword?

Ans:

It is a keyword which gives priority to the instance members.

If the same name is given to member variable as well as local variable then to distinguish the instance variable this keyword is used.

Example: `this.a=a;`

Here, **this.a** is an instance variable and **a** is a local variable.

90. What do you mean by constructor overloading?

Ans:

Use of more than one constructor in one class is called constructor overloading.

The constructors are separated by their signature.

91. What is method overloading?

Ans:

Use of more than one method in a class having the same name is called method overloading.

The methods can be made different by their signature.

Following are three different ways to make signature different

- Number of data type.
- Types of data type.
- Sequence of data type.

92. What is method prototype?

Ans:

It is the heading part of a method which tells the type of method defined.

It has three parts such as

- Return type
- Name of the method
- Signature part or parameter list

93. Write the parts of method prototype?

Ans:

A method prototype has following three parts such as

- Return type which deals with the output.
- Name of the method which helps to call the method.
- Signature which deals with the input.

94. What is composite data type?

Ans:

The data type which helps to allocate memory where different type of constants can be kept is called composite data type.

It is created through a keyword called **class**.

For example: `class A`

Here, A is called composite data type.

95. What is control statements?

Ans:

The statements which alter the flow of execution and provide better control on the flow of execution.

Examples: `if else`, `switch case`, `for loop`, `while loop`, `break`, `continue`, `return` statements.

They are useful to write better and complex programmes.

96. What is counter variable?

Ans:

The variable which is used to count or find the frequency of any occurrence in a programme is called the counter variable.

It is basically used within a loop.

97. What is operator precedence?

Ans:

Operator precedence determines the order in which the operators in an expression are evaluated.

It sets the priority of operators to be executed within the expression.

98. What is the use of new keyword?

Ans: **new** is a keyword which helps to create an object dynamically at the time of execution of a programme and returns the address of the object for further use.

Syntax: `ClassName refVar=new ClassName( );`

Here, the address of the object created will be kept in the reference variable.

# PREDICT THE OUTPUT – 1

TOTAL - 30

1. Determine the output of if N=3 [ Each case is different]
- System.out.print("N"+N);
  - N+=5 ; System.out.print (N);
  - N=(N--)\*N%5 ; System.out.print("N");
  - N= N – (++N%3); System.out.print("N="+N);
  - N= N – ++N%3; System.out.print("N="+N);

```
N3
8
N
N=2
```

2. int a=3, b=5, c=-5;  
System.out.println(a++ + b/2 - ++c%2);  
System.out.println(++a - b-- +c/2);  
System.out.println((double)(b/a));  
System.out.println((double)a/b);

```
5
-2
0.0
```

3. double x=-9.99;  
System.out.println(Math.abs(x));  
System.out.println(Math.sqrt(9.0));  
System.out.println(Math rint(x));  
System.out.println(Math.floor(x));  
System.out.println(Math.ceil(x));  
System.out.println(Math.round(x));  
System.out.println(Math.floor(Math.random()));

```
9.99
3.0
-10.0
-10.0
```

4. String a="computers" ,b="computers applications";  
System.out.println(b.indexOf(a.substring(4)));  
System.out.println(a.compareTo(b.substring(0,10)));  
System.out.println( b.equals(a));  
System.out.println(b.indexOf(3));

```
4
-1
false
```

5. Find the value :

- System.out.println(Math.floor (2.999));
- System.out.println(Math rint(-9.5));
- System.out.print("Earthquakes".substring(5).charAt(3) + "\n"+"Atmosphere".length());

```
2.0
-10.0
K
```

6. int q=5, r=15;  
while(q > 0 && r > 0)  
{ q/=q\*r;  
System.out.println(q+  
+); r/=3;  
}

```
0
0
```

7. int m = 6, n = 4;  
n /= m-- + (++n + m--) \* n;  
System.out.println(n + "\n " + );

```
0
4
```

## PREDICT THE OUTPUT – 2

1. 

```
public class Test
{
    public static void testing()
    {
        boolean r , t;
        r= 5 <2;
        t= 'a'>1;
        System.out.print("r = " + r + " \n t = " + t);
    }
}
```
- r=false  
t=true**
2. 

```
int m = 6, n = 4;
n += m-- + (++n + m--) * n;
System.out.println(n + m);
```
- 64**
3. Give the output of the following.
- ```
char ch='A';
int x = 32, y = 2;
System.out.println(ch+y);
System.out.println(ch+x);
System.out.println(++ch);
System.out.println(ch+=2);
System.out.println((char)(ch+x+y));
```
- 67  
97  
B  
D**
4. Find the value of z in the following program segment.
- ```
int x = 5, y = 12, z;
z = (x >= y ? x%3 != 1 ? x+x : x - y : y - x );
System.out.println(z);
```
- 7**
5. if String x = "Computer", y = "Applications computer"; What do the following functions return for:
- ```
System.out.println(x.compareTo(y));
System.out.println(y.indexOf(x,10));
System.out.println(y.indexOf(y.charAt(8)));
System.out.println(x.length( ) > y.length( ));
System.out.println(y.indexOf('i',4));
```
- 2  
-1  
4**
6. Give the output of the following
- ```
int x=13 ,y=5 ;
System.out.println (x++ + (x+1)+ --y );
System.out.println (Math.round(Math.ceil(++x + (float)(x+1)/ y-- ) ));
```
- 32  
19**
7. What will be the output:
- ```
int x=3,y=10;
x%=x++/4 - 10*--x+15%x-- ;
System.out.println(x);
x%=y*=(x+10)/4 - --x+x-- ;
System.out.println(x+" "+y);
```
- 3  
3 30**
8. What output will the following code fragment produce?
- ```
int c=900, x, n =2000;
x = n+ c >2550? 1350 : 1500;
System.out.println(x);
```
- 1350**

## PREDICT THE OUTPUT - 3

**TOTAL - 20**

1. What will be the output of the following codes if x =25.

```
void fun( int x )
{
    while(x > 0)
    {
        x/=10;
        System.out.println("x
        =" +x);
    }
    System.out.println(x);
}
```

X=2  
X=0  
0

2. Find the output of the following program segment,:

```
int val=120,n=55,sum1,sum2;
sum1= n+ val++>175?400:200;
sum2= n+ ++val>175?400:200;
System.out.println(sum1+" \n "+sum2);
```

200  
400

3. What is the output of the following:

```
System.out.println( "four:" +2+2);
System.out.println( "four:" +(2+2));
```

four:22  
four:4

4. What is the output of the following:

```
String S= "HELLO"; String
S2= "There"; String S3=
"HELLO"; String S4=
"THERE";
```

HELLO equals HELLO - true  
There equals THERE - true

```
System.out.println(S + " equals " + S3 + " — " + S.equals(S3));
```

```
System.out.println(S2 + " equals " + S4 + " — " + S2.equalsIgnoreCase(S4));
```

5. What will be the output for the following program segment?

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

a=360  
b=360  
c=41

6. Find the output of the following :

```
public void display()
{
    int i=1;
    while
    (i<=7)
    {
        System.out.println(i++);
        if(i==3 || i==4)
            continue;
        i++;
    }
}
```

1  
3  
4

7. Find the output :-

```
int a=10,b=15,c=25;
i) System.out.println(c!=a+b&&b==Math.abs(a-c));
ii) System.out.println((a==b+c)||b==c-a);
iii) System.out.println(!(a!=b)&&b==(a+c));
iv) System.out.println(a==b+c||!(b!=(a+c)));
```

false  
true  
false  
false

## PREDICT THE OUTPUT - 4

**TOTAL - 20**

1. Read the program segment given below and answer the questions:

```
public void sample ( )
{
    int ctr;
    for(ctr = 1; ctr <=4; ++ctr)
        {
            int u = func(++ctr);
            System.out.println
            (u++);
        }
}
static int func(int k)
{
    int z=0; z+=k;
    return z+5;
}
```

7
9
k ct

- a. Give the output of the above code snippet.
- b. Identify the formal parameters and the actual parameters.
- c. What is the function prototype of the called function?

2. `int a = 0, p=2;`

```
for( int i = 0; i < 5; ++i )
{
    a = (a++ + p) * (i++);
    System.out.println( a );
}
System.out.println( a );
```

0
4
24

3. Write the output of following statements :

```
int a=22,b=16; System.out.println("a++=
+(a++ +b)); System.out.println( "a>b=
+(a>b)); System.out.println("++a= "+
++a); System.out.println("a--= "+ a--);
System.out.println( a!=(a+b));
```

a++= 38
a>b= true
++a= 24
--a=24
true

4. Find the errors if any in the following program :

```
class 2forjoy
{
    public void _hmn ()
    {
        byte a=10; char b="D";
        int c= a > b ? a , b;
        System.out.println('The value is :'+c);
    }
}
```

<code>2forjoy</code>	- digit in the first place not allowed
<code>b="D"</code>	
<code>a,b</code>	- b='D'
<code>'The value is'</code>	-a:b
	-"The value is "



## Unsolved Programs:

1. WAP to accept a number and check whether the number is perfect number or not. A number is called perfect number, if the sum of all factors (except number itself) of the number is equal to that number. (For e.g. 6 is a perfect number. Factors are 1, 2 & 3 and the sum is  $1+2+3 = 6$ .)
2. WAP to generate all Perfect numbers up to 1000.
3. Write a program to accept a number, check whether the numbers is prime number or not. If number is prime, then display "PRIME NUMBER" or display "NOT A PRIME NUMBER".
4. Write a program to display all Composite numbers between 100 to 200.
5. The production (P) of crude oil of a country in millions of barrel may be estimated by the following set of equations, where t represent the times in years.  $P = 5+3t$ , for  $0 <= t <= 3$  and  $P = 14+(T-5/2)^2$ , for  $t > 3$ , Write a program to print the quantity of production for every year from  $t = 1$  to 10.
6. Write a program to accept a number then print the sum of digits and number of digits present in it. (E.g. If the input number is 225, the sum of digits is 9 and number of digits is 3).
7. Write a program to accept a number then print the number in reverse order. (E.g. If the input number is 245, the output will be 542)
8. Write a program to check whether a number is palindrome number or not. (Palindrome means, If the reverse of the number is same of original number)
9. A number is called Armstrong number if the sum of cube of each digit of the number is equal to that number. Write a program to accept a number then check whether the given number is Armstrong number or not. (E.g. 153 is a Armstrong number because  $153 = 1^3 + 5^3 + 3^3$ ).
10. Write a program to check whether all digits of the given number are same type or not (i.e. all are odd, all even numbers or both present)
11. Write a program to accept a number and then add all digits until you found a single digit number. If that single digit number is 1, then that number is called lucky number. (e.g. if number is 2345 then sum of its digits becomes 14, further sum of this digits is 5, so the number is not a lucky number)

Q12. WAP to print the sum of the following series:

(a)  $S = 1 + 2 - 3 + 4 - 5 + 6 - 7 + 8 - 9 + \dots + N^{\text{th}}$

(b)  $S = (X+1)^2 + (X+2)^3 + (X+3)^4 + (X+4)^5 + \dots + (X+N)^{N+1}$

(c)  $S = (1+2) + (1+2+3) + (1+2+3+4) + \dots + (1+\dots+15)$

(d)  $S = 1 + X + 2!X^2 + 3!X^3 + 4!X^4$

(e)  $S = 1x^2 + 2x^3 + 3x^4 + 4x^5 + \dots + 19x^{20}$

Q13. Display the following Design Using Nested Loops:

a. \*  
\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*  
\*

b. \*  
\*\*\*  
\*\*\*\*\*

\*\*\*\*\*

c. 1111  
2222  
3333  
4444

d. 0  
12  
345  
6789

e. 1  
21  
321  
4321  
54321

f. 55555  
4444  
333  
22  
1

g. 1  
22  
333  
4444  
55555

h. 54321  
5432  
543  
54  
5

i. 12345  
1234  
123  
12

1

j.

12345

2345

345

45

5

5

45

345

2345

12345

k.

1

212

32123

4321234

543212345

l.

1

121

12321

1234321

123454321

Q14. Write a program in java to calculate discount on purchase . Accept Customer Number and purchase Amount. Calculate and display the net amount to be paid by the customer along with customer number.

Purchase Amount

<=10000

>10000 and <=20000

>20000 and <=30000

>30000

Discount

7%

10%

15%

20%

15. Design a class to overload a function compare( ) as follows:

void compare (int , int) : to compare two integer values and print the greater of the two integers.

void compare(char, char): to compare the numeric value of two characters and print the character with higher numeric value

void compare(String String): to compare the length of the strings and print the longer of the two.

16. Design a class to overload a function area( ) as follows:

i. double area( double a, double b, double c): with three double arguments return the area of a scalene triangle using the formula:  $\sqrt{s(s - a)(s - b)(s - c)}$

where,  $s = \frac{a+b+c}{2}$

ii. double area(int a, int b, int h) : with three integer arguments return the area of a trapezium, using the formula :  $area = \frac{1}{2}h(a + b)$

iii. double area(double d1, double d2):with two double arguments , return the area of a rhombus, using the formula :  $area = \frac{1}{2}d1d2$

17. Design a class to overload a function series( ) as follows:

i. double series(double n) with one double argument and returns the sum of the series

$$Sum = \frac{1}{1} + \frac{1}{2} + \dots + \frac{1}{n}$$

ii. double series(double a, double n) with two double arguments and return the sum of the series

$$Sum = \frac{1}{a^2} + \frac{4}{a^5} + \frac{7}{a^8} + \dots + n \text{ terms.}$$

18. Define a class salary described as follows

Data Members : Name, address, phone, subject specialization, monthly salary, income tax

Member Methods: (a) to accept the details of a teacher including the monthly salary

(b) to display the details of the teacher

(c) to compute the annual income tax as 5% of the annual salary

above Rs. 1,75,000/-

Write a main method to create object of a class and call the above member method.

19. Write a program using a function called area( ) to compute the area of a:

(i) circle ( $\pi \times r^2$ ) where  $\pi = 3.14$

(ii) square ( $side \times side$ )

(iii) rectangle ( $length \times breadth$ )

Display the menu to output the area as per the user's choice.

20. Define a class Pattern to overload with functions as detailed below:

1. public void pattern(int r, int c) – Accepts two integer value and creates filled rectangular box of 'r' row and 'c' column with character '\*'.  
2. public void pattern( int r ) – Accepts one integer value and creates a right angle triangle (unfilled) with character '^'.  
3. public void pattern( int r, char c ) – Accepts one integer value and one character and creates a filled square pattern filled with character c.

21. Define a class TaxiBill having the following description:

**Data members/instance variables**

int taxino                    - to store taxi number  
String name                    - to store passenger's name  
int km                         - to store number of kilometers travelled  
double bill                    - to store the bill amount

**Member functions:**

TaxiBill () - constructor to initialize taxino to 0, name to " ", km to 0 and bill to 0.

input() - to store taxino, name, km

calculate() - to calculate bill for a customer according to given conditions

<u>Kilometers travelled (km)</u>	<u>Rate/km</u>
up to 1 km	Rs 25
2 km to 6 km	Rs 10
7 km to 12 km	Rs 15
13 km to 18 km	Rs 20
Above 18 km	Rs 25

display()- To display the details in the following format

<b>Taxi No</b>	<b>Name</b>	<b>Kilometers travelled</b>	<b>Bill amount</b>
-----	-----	-----	-----

Create an object in the **main()** method and call all the above methods in it.

22. Define a class ElectricBill with the following specification:

Class : ElectricBill

Instance variable/data member:

String n – to store the name of the customer

int units – to store the number of units consumed

double bill – to store the amount to be paid

Member methods:

void accept( ) –to accept the name of the customer and number of units consumed.

void calculate( ) – to calculate the bill as per the following tariff:

<u>Number of Units</u>	<u>Rate per Unit</u>
First 100 units	Rs. 2.00
Next 200 units	Rs. 3.00
Above 300 units	Rs. 5.00

A surcharge of 2.5% charged if the number of units consumed is above 300 units.

void print( ) – to print the details as follows:

Name of the customer:

Number of units consumed:

Bill Amount:

Write a main method to create an object of the class and call the above member methods.

23. Write a program in java using a class with following specification:

Class Name : Micro\_Oven

Date members : String name, String model, double marked\_price, String size,

double discount, String date

Member Method :

public Micro\_Oven( ): to initialize the data members.

public void get( ) : to accept the various information about the Oven.

public cal( ) : If the price of the oven exceeds Rs.10000 then  
discount = 5% on the marked price otherwise no  
discount.

public display() : to show the details of the oven with discount and amount  
to be paid.

Write a main( ) to create object of class Micro\_Oven and call the member  
methods.

24. Define a class Transport with following Data members and member methods:

Data Member:

String name : to store the name of the customer

String place : to store the name of the destination  
 int distance : to store distance in Km.  
 double freight : to store the transport Charges

Member Methods:

Transport ( ) :Parameterised constructor to initialize the data members.

Compute ( ) :To compute the transport charges based on following conditions:

1. Up to 300 Km `10,000/-
2. For every additional 100 Km or fraction thereof `800/-.

display ( ) :To display the name, destination, distance and transport charges.

25. Define a class named BookFair with the following description:

Instance variable/Data Members:

String Bname – stores the name of the book

Double price – stores the price of the book

Member Method:

i. BookFair() – Default constructor to initialize the data members

ii. void input() – To input and store the name and the price of the book

iii. void calculate ( ) – To calculate the price after discount. Discount is calculated based on following criteria:

Price	Discount
Less than or equal to Rs.1000	12% of price
More than Rs.1000 and less than equal to Rs.3000	17% of price
More than Rs.3000	20% of price

iv. void display() – To display the name and price of the book after discount

Write a main method to create an object of the class and call the above methods.

26. Define a class “Library” with following specifications:

Instance variables/Data Members:

int bno : to store book number

int phno :to store phone number of the student.

String name :to store name of the student.

int days :to store the number of days returned late.

double fine : to calculate and store the fine.

Member Methods:

Library() :default constructor to initialize the data members.

void input() :to input and store the details of the student.

void compute() :to compute the fine:

The fine is charged on the following basis:

For first 5 days Rs. 2.50 per day

Next five days Rs. 3.00 per day

Rest of the days Rs. 5.00 per day



void display() :to display the details in the following format:  
 Book No. Phone No. Name No. of days Late Fine

27. Define a class Furniture with following specifications:

Instance Variables/Data Members

1. String Cust\_name : To store the name of the customer
2. double MarkedPrice : To store the cost of the article purchased.
3. double discount : To store the discount allowed on the purchase.
4. double NetPrice : To store the net amount to be paid by the customer.

Member Method:

1. Furniture () : Parameterized constructor to initialize the data members.
2. void calculate () : To calculate the discount allowed and the net price of the article as per the following.

<u>Cost of the Article</u>	<u>Discount</u>
Up to Rs.5,000.00	16%
Rs.5,001.00 to Rs.10,000.00	30%
Above Rs,10,000.00	35%

3. Void display () :To display the Customer's Name, Total cost of the article , the Net Amount to be paid by the customer in the format given below:

Customer Name	Purchase Amount	Discount	Net Amount
---------------	-----------------	----------	------------

28)WAP to read a word. Print the position of the first vowel occurring in the word. If there is no vowel in the word then print " no vowel present".

29 )WAP in JAVA to take a proverbial statement (like 'Failure are the pillars of success') as an input from the user and then output the frequency of the vowels occurring in the statement.

30)WAP to accept a sentence and print total number of vowels and consonants

31)WAP to accept a sentence and replace all vowels with "\*".

32)Write a program to accept a name LAL BAHADUR SHASTRI. Display the out put as follows

- i) L.B S
- ii) SHASTRI L.B

33)WAP to accept a sentence and display how many palindromes are present in it.

34.WAP to accept a name "ALOK KUMAR GUPTA" and replace ALOK with ASHOK.

35.WAP to accept a sentence and find out the total number of vowels in each word.

36.WAP to accept a sentence and find out the longest word along with its length.

37.WAP to accept a sentence and reverse each word in the sentence.

38.The annual examination results of 50 students in a class are tabulated as follows.

Roll No.	Subject A	Subject B	Subject C
----------	-----------	-----------	-----------

-----

-----  
-----  
-----  
-----  
Write a program to read the data, calculate and display the following:

- (a) Average mark obtained by each student.
- (b) Print the roll number and average marks of the students whose average mark is above 80.
- (c) Print the roll number and average marks of the students whose average mark is below 40.

[2009]

39 Write a program to accept name and total marks of N number of students in two single subscript array name[ ] and totalmarks[ ].

Calculate and print:

- (i) The average of the total marks obtained by N number of students.

[average = (sum of total marks of all the students/N)]

- (ii) Deviation of each student's total marks with the average.

[deviation = total marks of a student - average]

[2018]

40 Write a program to input integer elements into an array of size 20 and perform the following operations:

- (i) Display the largest number from the array.
- (ii) Display the smallest number from the array.
- (iii) Display sum of all the elements of the array.

[2017]

41. Write a program to input and store roll numbers, names and marks in 3 subjects of n number students in five single dimensional array and display the remark based on average marks as given below: ( The maximum marks in the subject are 100)

Average marks = Total Marks/3

Average marks Remarks

85 - 100 EXCELLENT

75 - 84 DISTINCTION

60 - 74 FIRST CLASS

40 - 59 PASS

Less than 40 POOR

[2015]

5. Write a program to initialize the seven Wonders of the World along with their locations in

different arrays. Search for a name of the country input by the user. If found, display the name of the country along with its Wonder, otherwise display "Sorry Not Found".

Seven Wonders - CHICHEN ITZA, CHRIST THE REDEEMER, TAJ MAHAL,

GREAT WALL OF CHINA, MACHU PICCHU, PETRA,

COLOSSEUM

Locations – MEXICO, BRAZIL, INDIA, CHINA, PERU, JORDAN, ITALY

Example – Country Name : INDIA Output : INDIA - TAJ MAHAL

Country Name : USA Output : Sorry Not Found

[2016]

6. Write a program to accept the year of graduation from a school as an integer value from the user.

Using the Binary Search technique on the sorted array of integers given below, output the message "Record exists" if the value input is located in the array. If not, output the message

"Record does not exist".

{1982, 1987, 1993, 1996, 1999, 2003, 2006, 2007, 2009, 2010}

[2014]

7. Write a program to accept the names of 10 cities in a single dimension string array and their

STD(Subscribers Trunk Dialing) codes in another single dimension 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, or else display the message "Search Unsuccessful, No such city in the list". [2012]

8.. Write a program to create an array to store 10 integers and print the largest integer and the smallest integer in that array. [2011] Write a program to perform binary search on a list of integers given below, to search for an element input by the user, if it is found display the element along with its position, otherwise display the message "Search element not found".

5, 7, 9, 11, 15, 20, 30, 45, 89, 97

[2010]

9. Write a program to initialize an array of 5 names and initialize another array with their respective telephone numbers. Search for a name input by the User, in the list. If found, display "Search Successful" and print the name along with the telephone number, otherwise display "Search

Unsuccessful. Name not enlisted".[2005]

11. Write a program to initialize the given data in an array and find the minimum and maximum values along with the sum of the given elements.

Numbers : 2 5 4 1 3

Output: Minimum value : 1

Maximum value : 5

Sum of the elements : 15

[2007]

10.. Define a class and store the given city names in a single dimensional array. Sort these names in alphabetical order using the Bubble Sort technique only.

INPUT : Delhi, Bangalore, Agra, Mumbai, Calcutta

OUTPUT : Agra, Bangalore, Calcutta, Delhi, Mumbai [2008]

11. Write a program to input fifteen different names in an Array. Arrange these names in ascending order using any sorting technique. (Use Input stream). [2007]

12. Write a program to input and store the weight of ten people. Sort and display them in descending order using the selection sort technique. [2011]

13. Write a program to accept 15 integers from the keyboard, assuming that no integer entered is a zero. Perform selection sort on the integers and then print in ascending order. [2006]

14 Write a program to bubble sort the following set of values in ascending order:-

5, 3, 8, 4, 9, 2, 1, 12, 98, 16

Output : 1 2 3 4 5 8 9 12 16 98 [2005]

15. Write a program to input 10 integer elements in an array and sort them in descending order using the bubble sort technique.[2013]

16. Write a program to input twenty names in an array. Arrange these names in descending order of alphabets, using the bubble sort technique. [2015]

17. Write a program to input forty words in an array. Arrange these words in descending order of alphabets, using selection sort technique. Print the sorted array. [2017]

18. Write a program to store 10 names in an array. Arrange these in alphabetical order by sorting. Print the sorted list. Take single word names, all in capital letters,

e.g. SAMEER, BIJAY, SUBODH, JAMES, etc.

19.. WAP to create a 4x4 two Dimensional Array and do the followings

i) Display the Array

ii) Display sum of each row and column

iii) Display sum and product of both the diagonals.