1) Can abstract class have constructors in Java?

Ans. Yes

2) Can abstract class implements interface in Java? do they require to implement all methods?

Ans. Yes an abstract class implements interface and it is not necessary to implement all methods.

3) Can abstract class be final in Java?

Ans. No

4) Can abstract class have static methods in Java?

Ans. Yes

5) Can you create instance of abstract class?

Ans. No

6) Is it necessary for abstract class to have abstract method?

Ans. No

7) Difference between abstract class and interface in Java?

Ans. In interface all methods are public and abstract and all variables are static and final. But in abstract class it is not necessary that it contains any abstract method and it can contain instance members also.

8) When do you favor abstract class over interface?

Ans. When we want to define some common implementation in all sub classes then we use interface. And if we want to define some only some methods to be implemented in sub class as per requirements rest methods are already defined in parent then we use abstract class.

9) What is abstract method in Java?

Ans. If a method in class is declared using abstract keyword and it doesn't have any definition than it is called an abstract method. If a class have an abstract method then the class should also declared as abstract. Then the child class of this abstract class will have to override this method.

10) Can abstract class contains main method in Java ?

Ans. Yes

11) what is static block in java?

Ans. When a block is declared as static it's called a static block.

It is used to initialize the static members. It gets executed when the class loads in the memory.

12) What is the need of static block?

Ans. To initialize the static members.

13) Can we overload static methods in java?

Ans. Yes

14) Can we call super class static methods from sub class?

Ans. Yes

15)What is the difference between final and static keywords?

Ans. Final keyword can be used with variables, methods, class. If a variable is final its value cannot be changed, If a method is final it cannot be override and if a class is final it cannot be extended.

Static keyword can be used with variables, methods, blocks. Static member are not instance member they does not exist in object memory but same static member is accessible among all objects.

16) Write a note on covariant return type with example code.

Ans. In covariant return type, the return type of overriding method is changed to a subtype of overridden method's return type.

class Parent{

public Parent getInstance(){ // here return type of this method is Parent

return this;

}

public void display(){

System.out.println("Hello Parent");

}

}

class Child extends Parent{

public Child getInstance(){ //here return type of this method is changed to Child

return this;

}

public void display(){

System.out.println("Hello Child");

}

}

public class Test{

public static void main(String[] ar){

Parent parent=new Parent();

Child child=new Child();

Parent newParent=parent.getInstance();

Child newChild=child.getInstance();

newParent.display();

newChild.display();

}

}

17) Write a note on Enum with example code.

Ans.  Enumeration is a set of named constant. In enumeration by default all constant is public, static and final.

import java.util.Scanner;

public class Test1 {

public static void main(String[] ar)

{

Scanner in=new Scanner(System.in);

System.out.print("Enter first number : ");

int a=in.nextInt();

System.out.print("Enter Second number : ");

int b=in.nextInt();

System.out.print("Enter choice (SUM,SUBTRACT,MULTIPLY,DIVIDE) : ");

String c=in.next();

Calc choice=Calc.valueOf(c);

switch(choice){

case SUM:

System.out.println("Sum is : "+(a+b));

break;

case SUBTRACT:

System.out.println("Subtraction is : "+(a-b));

break;

case MULTIPLY:

System.out.println("Multiplication is : "+(a\*b));

break;

case DIVIDE:

System.out.println("Division is : "+(a/b));

break;

default:

System.out.println("Invalid");

}

}

}

enum Calc{

SUM,SUBTRACT,MULTIPLY,DIVIDE

}

18) Write a note on use of super keyword and super() method.

Ans. Super keyword is used to refer to parent class. When the parent class and child class both have members with same name, So child's object always prefer its own members but if you want to call the members of parent class then we use super keyword.

To call the parent class constructor we use super() method.

19) Write a code to implement abstraction using interface.

Ans. ----------------------------------------------------------

interface Stack{

void push(int x);

int pop();

void display();

}

class StackImpl implements Stack{

private int stack[];

private int pos;

StackImpl(int size){

stack=new int[size];

pos=-1;

}

public void push(int x){

if(pos<stack.length-1){

pos++;

stack[pos]=x;

}

}

public int pop(){

int temp=0;

if(pos>-1){

temp=stack[pos];

pos--;

}

return temp;

}

public void display(){

for(int i=pos;i>=0;i--)

System.out.print(stack[i]+" ");

}

public void search(int value){

//searching logic

}

}

public class Test1{

public static void main(String ar[]){

Stack s=new StackImpl(5);

s.push(23);

s.push(24);

s.push(25);

s.push(26);

System.out.print("stack : ");

s.display();

s.pop();

s.pop();

System.out.print("\nstack after pop : ");

s.display();

//s.search(23); Not accesible due to abstraction

}

}

20)Write a Java program to sort a numeric array and a string array.

Ans.-----------------------------------------------------------

public class Test{

static void numericSort(int input[]){

int i,j,temp;

for(i=0;i<input.length-1;i++)

for(j=0;j<input.length-1-i;j++){

if(input[j]>input[j+1]){

temp=input[j];

input[j]=input[j+1];

input[j+1]=temp;

}

}

}

static void stringSort(String input[]){

int i,j;

String temp;

for(i=0;i<input.length-1;i++)

for(j=0;j<input.length-1-i;j++){

if(input[j].compareTo(input[j+1])>0){

temp=input[j];

input[j]=input[j+1];

input[j+1]=temp;

}

}

}

public static void main(String[] ar){

int numbers[]={45,23,78,23,76,9,25,7};

String strings[]={"India","Australia","America","Africa","London","Brazil"};

System.out.print("Input : ");

for(int n:numbers){

System.out.print(n+" ");

}

System.out.println();

numericSort(numbers);

System.out.print("Output : ");

for(int n:numbers){

System.out.print(n+" ");

}

System.out.println();

System.out.print("Input : ");

for(String s:strings){

System.out.print(s+" ");

}

System.out.println();

stringSort(strings);

System.out.print("Output : ");

for(String s:strings){

System.out.print(s+" ");

}

}

}

21)Write a Java program to sum values of an array.

Ans.-----------------------------------------------------------

import java.util.Scanner;

public class Test{

public static void main(String[] ar){

Scanner in=new Scanner(System.in);

System.out.print("Enter the number of elements : ");

int size=in.nextInt();

int[] numbers=new int[size];

for(int i=0;i<size;i++){

System.out.print("Enter numbers["+i+"] : ");

numbers[i]=in.nextInt();

}

int sum=0;

for(int n:numbers)

sum=sum+n;

System.out.println("Sum of the elements is : "+sum);

}

}

22)Write a Java program to remove a specific element from an array.

Ans.-----------------------------------------------------------

import java.util.Scanner;

public class Test1{

public static void main(String[] ar){

int numbers[]={45,23,78,23,76,9,25,7};

System.out.print("Input : ");

for(int n:numbers){

System.out.print(n+" ");

}

System.out.println();

Scanner in=new Scanner(System.in);

System.out.print("Enter index of value to delete : ");

int index=in.nextInt();

for(int i=index;i<numbers.length-1;i++)

numbers[i]=numbers[i+1];

numbers[numbers.length-1]=0;

System.out.print("Output : ");

for(int n:numbers){

System.out.print(n+" ");

}

}

}

23)Write a Java program to reverse an array of integer values.

Ans.-----------------------------------------------------------

import java.util.Scanner;

public class Test{

public static void main(String[] ar){

Scanner in=new Scanner(System.in);

System.out.print("Enter the number of elements : ");

int size=in.nextInt();

int[] numbers=new int[size];

for(int i=0;i<size;i++){

System.out.print("Enter numbers["+i+"] : ");

numbers[i]=in.nextInt();

}

int temp;

size=size-1;

for(int i=0;i<numbers.length/2;i++){

temp=numbers[i];

numbers[i]=numbers[size];

numbers[size]=temp;

size--;

}

System.out.print("Output : ");

for(int n:numbers){

System.out.print(n+" ");

}

}

}

24)Write a Java program to find the duplicate values of an array of integer values.

Ans. ------------------------------------------------

import java.util.Set;

import java.util.LinkedHashSet;

public class Test1 {

public static void main(String[] ar)

{

int numbers[] = {12,21,25,45,56,21,12,45,55};

Set<Integer> duplicateValues=new LinkedHashSet<>();

for (int i = 0; i < numbers.length-1; i++){

for (int j = i+1; j < numbers.length; j++){

if (numbers[i] == numbers[j]){

duplicateValues.add(numbers[i]);

}}}

System.out.print("Duplicate Values are : ");

for(int n:duplicateValues)

System.out.print(n+" ");

}

}