qwertyuiopasdfghjklzxcvbnmqwert ertyuiopasdfghjklzxcvbnmqwert yuiopasdfghjklzxcvbnmqwertyui

opasdfg sdfghjk ghjklzx

A Complete Workbook on Core Java Programming

Compiled By Er. Brijesh Mishra

Under the Expert Guidance of Er. Ajay Chaudhary MD & Chairman, Softpro Group yuiopa opasdf sdfghj fghjklz



About the Workbook...

Olhora

The "Workbook on Core Java" has been written keeping in mind the requirements of a learner of Java on practical grounds. The Workbook carries the multiple question modules like Long Answers, Short Answers, Multiple Choice Type & even Technical Tasks carrying programs for complete learning of a student.

Softpro mini

dial 150m

"Whether you're a final year student with a challenging project in mind; a pre-final year student with plans for planting roots in Java Technology, or an enthusiastic second year student with zeal to learn a new technology, or a fresher seeking job in Java, this Workbook has everything for you."

Team Softpro always is fond of coming up with some or the other new ventures which are helpful & beneficial for the students. We hope that this Workbook will also play a vital role in your journey of Learning Java Technology.

ents & landial | Softpro Indial | Softpr You can always give us suggestions & feedback for more improvements tial Softpro India | Softpro I



India



adial Softpro Indial

Dear Readers,

Eby Softpro Ir Softpro Indial Soft Softpro Group has been growing exponentially since years and it is your trust in us that gives us the power and encouragement to take bigger and better steps. I feel immense happiness that now we are presenting you with this Workbook on Java and are able to assure you with the

The Workbook delivers the enrich question bank prepared by the author which he has earned with the years of experience working on Java and hence the "World" help you to become Gortpro Indial Softpro India on Core

on Core

Softpro India | Softpro India | Softpro India |

COLL





India

Dear Readers,
Our ongoing endeav
Now, Softproprovi Our ongoing endeavor to excel and to succeed has penned a saga of success in I.T. Training. Now, Softpro India is more than happy to present you with this "Workbook" which will provide you enough knowledge & will a make you practice on Java to become an expert in Java.

Softpro India | Softpro India apro Indial Softpro Indial Softpro Indial Softpro Indial



indial | Softpro Illuia SoftPro Indial 150111 Acknowledgement

Lor-1 Firstly, I pay my regards & thank Lord Shri Rama for bestowing me with His blessing which enabled me to successfully pen down this Workbook on Java. It would have been impossible without His grace.

I will also take this opportunity to thank the staff of Softpro India who has been a constant support throughout my journey.

Thank you,

stpro



SOL TO



Softpro

indial | SoftPro Invio sh M' About the Writer Brijesh Mishra is having a fulfilling Experience of more than 15 Years working in the Software Development field and have a great command in Programming Concepts & Database Idial | SoftPro Indial | SoftPro India | S Administration. He has worked on ERPs, customized software applications, cloud-based applications, PLC devices and many more. Currently he is working as Senior Consultant in Jial Soft o India Softpro India Computer Technologies P Limited. Softpro India

COMPETENCY IN TECHNOLOGIES

- Languages: C, C++, C#, Python, Java, Assembly, R, Go
- al Softi Microsoft Based: VB /ASP /.NET/SQL Server
- dial Softpro In Database Applications: Oracle Enterprise Edition & Oracle Developer 2K
 - Platforms: Android, Windows, Linux
 - Frameworks: Struts, Hibernate, Spring
 - Business Domains: Finance, Retail, Mobile Applications, ERP, Telecom.
- ial Softpro India | Softpro In ., PLC Others: Machine Learning, IOT, Data Science, Embedded System, PLC Programming Softpro Indial | Softpro Indial |

ndial

COLL



COFTPIC	India, Softh Than 1 Son word
ial se tre	Π
1/501	Table of Contents
ndia Go	That I learn 1
S. No.	Table of Contents Topic Why Java Language? Features of java. JVM (Java Virtual Machine) JRE (Java Runtime Environment) JDK (Java Development Kit) Java Program Structure Input and outputs in java Decision Controls in Java If statement If-else statement Nested if-else statement Ladder if – else statement Switch statement
to Indial	Why Java Language? Features of java. JVM (Java Virtual Machine) JRE (Java Runtime Environment) JDK (Java Development Kit) Java Program Structure Input and outputs in java Decision Controls in Java If statement If-else statement Nested if-else statement Ladder if – else statement Switch statement Loop Controls in Java Importance of loop controls While loop
Train	Features of java.
200	JVM (Java Virtual Machine)
100	JRE (Java Runtime Environment) IDK (Java Davalonment Kit)
0,0	Java Program Structure
Softpro Indi	Input and outputs in java
Soft F	Decision Controls in Java
COLLA	If statement
1/2	If-else statement
3,	Nested if-else statement
120	Ladder if – else statement
alial Soltp	
120	Loop Controls in Java
dia'	While loop
111	
3.	For loop Do-while loop For each loop
Trick	For each loop
wio di	Array in Java
The Thou	Array in Java Objective of array
4.	Importance of Array
cofth 1	Declaration of array
oro	Initialization of Array
COLCY	Taking input for an array
1/20	o rial store dia, cette
CKO.	Softpro India Computer Technologies P Ltd Page 6
	30 rt pro rii dra computer recimorogres r Eta rageo

848



SoftPre	radia, coffi mon lon lon
2/190	String in Java What is a string? Built-in functions in string Work on built-in functions Method in Java Importance of method in Java Types of methods
ndial SoftP	String in Java What is a string? Built-in functions in string Work on built-in functions Method in Java Importance of method in Java Types of methods Difference between static and nonstatic methods
	String in Java
adja 5.	What is a string?
11/20	Built-in functions in string
ro Indial So	Work on built-in functions
In	Method in Java
10 110	Importance of method in Java
1006.	Types of methods
10	Difference between static and nonstatic methods
ro Indial	Recursion
40)	Object-Oriented Programming System
CKP	Pillars of OOPS
Softp 70 I	Class and object
WOTO TO	Constructor in java
al 150/ttp.	Work on built-in functions Method in Java Importance of method in Java Types of methods Difference between static and nonstatic methods Recursion Object-Oriented Programming System Pillars of OOPS Class and object Constructor in java Types of constructor Inheritance in Java Importance of Inheritance Types of Inheritance Polymorphism in java Types of Polymorphism in Java
1 100	Inheritance in Java
CO8,77	Importance of Inheritance
12	Inheritance in Java Importance of Inheritance Types of Inheritance Polymorphism in java
tia'	Polymorphism in java
100	Types of Folymorphism in Java
9.	Method Overloading
100,	Method Overriding
01	Difference between method overloading and overriding
2 die	Interface in Java
10 D	Importance of Interface in Java
10.	Interface, Abstract class and class – A discussion
True	Difference between interface and abstract class
ror	Exception in Java
Copie	Types of exceptions in Java
1D	Exception handling in java
Sech	Types of exception handling in Java
150	of in those dia, leth,
CKD,	Tra coper 100 '20,
	Softpro India Computer Technologies P Ltd Page 7

848



EXPI	adja, coffy Thou Por Por
1501	oline al Septepro
ia, Exb.	India Court India
1150	Explanation of try, catch and finally
dia"	Difference between throw and throws
1100	Multithreading in Java
212	Difference between Multithreading and Multitasking
12.	Thread life cycle
119/	Creation of thread by extending Thread class
Tagir	Creation of thread by implementing Runnable interface
00)	Package in Java
13.	Types of packages in Java
10 h	Creation of Package
646	Collection framework in Java
50,	Importance of Collection Framework
14.	ArrayList class
50	LinkedList class
2 00	Iterator interface
COLUL	ListIterator Interface
15.	HashSet Class
910 ,00	TracSat Class
13	TreeSet Class
dia,	COLLA MON COLLI TUCK 120
The	so ro rial word dia
212	offly India Copy Inc. 15
Inco	150 1011 1121
110 A10	Iterator interface ListIterator Interface HashSet Class LinkedHashSet Class TreeSet Class
Ch Prov	190, 11, 1/20, 1/3
oro.	rial store dia cofte modice
Office It	ight Borns The 1/20 to h
20 2	is all those dia the
ELB,	ListIterator Interface HashSet Class LinkedHashSet Class TreeSet Class
, 150	Oly 112 CADLO
TI CLOI	dia cotte mai coin
	ListIterator Interface HashSet Class LinkedHashSet Class TreeSet Class Softpro India Computer Technologies P Ltd Page 8
	the dia cofth toge could
3-3-17 X	



Java Lecture - 01

Storo Min.

Etpro Indial (Introduction to Java)

indial | Softpro Inuia Softpro Indial 150111

1. What is Java? Write its features with an explanation.

Long Answer Questions:
1. What is Jave? dial Softpro Indial Softpro Indial Softpro Indial Softpro Indial James Ans: - Java is a powerful object-oriented programming language developed by James Gosling in the year 1995. 2. Object-Oriented
3. Platform Independent
4. Architectural Neutral
5. Portable
6. Robus

Java Features: -

Softpro

al Softp

oIndial

al Softp

- Secure
- 8. Dynamic
- 9. Distributed
- 10. Multithreaded
- 11. Interpretive
- 12. High Performance

1. Simple: -

Softpro India

Softpro India

Se: Java is a simple programming language because:

- tpro Indial | Softpro In Java technology has eliminated all the difficult and confusion-oriented concepts like pointers & multiple inheritances.
- The C, CPP syntaxes are easy to understand and easy to write. Java maintains C and CPP syntax mainly hence Java is a simple language.
- Java technology takes less time to compile and execute the program.

2. Object-Oriented: -

dial | Softpro India Java is an object-oriented technology as it represents total data in the form of objects. By using object reference, we are calling all the methods, variables which is present in that class.

ro India

3. Platform Independent: -

Soft



- Compile the Java program on one OS (operating system). That compiled file can be executed on any OS (operating system). This phenomenon is called Platform Independent Nature.
- Java is a platform-independent language. The Java applications allow its applications compilation at one operating system which can be compiled (.class files) and can be executed on any other operating system.

4. Architectural Neutral: -

Java Tech Applications that are compiled on one Architecture (Hardware----RAM, Hard Disk) and then that Compiled program runs on any other hardware architecture (hardware). This is called Architectural Neutral.

5. Portable: -

In Java tech, the applications are compiled and executed on any OS (Operating System) and in any Architecture (hardware) hence we can say Java is a portable language.

6. Robust: -

Any technology which is good in the below mentioned areas, is said to be ROBUST.

- 1. Exception Handling
- 2. Memory Allocation

JAVA is Robust because

- JAVA is having very good predefined Exception Handling Mechanism. If we get any exception, we will get meaningful information.
- JAVA is having a very good memory management system that is Dynamic Memory Allocation (memory is allocated at runtime) which allocates and deallocates memory for objects at runtime.

7. Secure: -

- To provide implicit security feature, Java provides one component inside JVM which is called Security Manager.
- To provide explicit security for the Java applications, we are having a very good predefined library in the form of java.security package.

8. Dynamic: -

Java is a dynamic technology as it follows dynamic memory allocation (at runtime the memory is allocated) and dynamic loading to perform the operations.

9. Distributed: -



By using JAVA technology, we prepare Standalone Applications and Distributed Applications.

- Standalone Applications are those Java Applications that doesn't need Client-Server Architecture.
- Web Applications are those Java Applications which need Client-Server Architecture.
- Distributed applications are those Java Applications where the project code is distributed in multiple numbers of JVM's.

10. Multithreaded: -

- Thread is a light weight process and a small task in a large program.
- If any tech allows executing a single thread at a time such type of technologies are called single threaded technology.
- If any technology allows creating and executing more than one thread at a time, they are called as multithreaded technology e.g. JAVA.

11. Interpretive: -

Java tech is both Interpretive and Completive. By using Interpreter, we convert source code into byte code. The interpreter is a part of JVM.

12. High Performance: -

If any technology has features like Robust, Security, Platform Independent, Dynamic and so on, that technology is a high performance technology.

2. Explain JDK, JRE and JVM.

Ans: - JDK: The Java Development Kit (JDK) is one of the three core technology packages used in Java programming along with the JVM (Java Virtual Machine) and the JRE (Java Runtime Environment).

JRE: A Java Runtime Environment (JRE) is a set of components used to create and run a Java application. A JRE is part of a Java Development Kit (JDK).

JVM: - JVM (Java Virtual Machine) is an abstract machine. It is a specification that provides runtime environment in which java byte code can be executed. Indial | SoftP

SoftPro India 3. Explain coding convention in java.

Java coding conventions: -

Classes:



Pro Indial 19

- Class name starts with an upper case letter and every inner word also starts with an upper case letter.
- This convention is also known as **camel** case convention.
- The class name should be noun.

Ex: - String, StringBuffer, InputStreamReader

Interfaces: -

- Interface name starts with an upper case and every inner word also starts with an upper roIndia case letter.
- This convention is also known as **camel** case convention.
- The Interface name should be noun.

Ex: - Serializable, Cloneable, RandomAccess.

Methods:

- Method name starts with lower case letter and every inner word starts with upper case
- This convention is known as mixed case convention.
- Method names should be verb.

Ex: - post(), charAt(), toUpperCase(), compareToIgnoreCase()....

Variables: -

- Variable name starts with lower case letter and every inner word starts with upper SoftPro Indial Soft Etpro India case letter.
- This convention is also known as mixed case convention.

Ex: - out, in, pageContextetc.

Ex Package: -

Package name must be written in lower case letter.

Ex: - java.long, java.io, java.util

Constants: -

While declaring a constant, all the words are uppercase letters.

MIN_PRIORITY NORM_PRIORITY Ex: MAX_PRIORITY

NOTE: -The coding standards are applicable only for predefined library and not for user defined library but it is recommended to follow the coding standards for user defined library also.



indial | Softpro Inuia ..., class name, method name

..., c Java program like

Let a called identifier.

4. How to take user input in Java? Explain step by step.

Ans: - Java.util.Scanner (Dynamic Inc.)

1. Scanner

Stpro Mich

dial 150m

```
..extFloat()

--> s.nextbyte()

..ng value --> s.next()

.get single line --> s.next(ine()

to close the input stream ---> s.close()
Softpro India | Softpro India |
Softpro India | Softpro India | Softpro India | Softpro India | Softpro India |
           apro Indial Softpro Indial Softpro Indial Softpro Indial
```



Short Answer Questions: -

1. Write the examples of Editor and IDE.

Ans: - Editor: - Editor is a tool or software which provides a very good environment to develop java applications. Ex: - Notepad, Notepad++, edit Plus.....etc.

IDE: - IDE provides a very good environment to develop the application and is a real-time standard. However it is recommended not to use IDE to develop Core Java Applications.

What is OOPS? Write its pillars.

Ans: - OOPS: - OOPS stands for Object Oriented Programming System. It is a mechanism of Softpio software development. It has four pillars: pro India

- Abstraction
- ii. Encapsulation
- iii. Inheritance
- Polymorphism iv.

3. Explain program structure in Java.

Ans: - Program structure of a java program is given below: -

```
Indial |Softpro India
                                                      tpro Indial Softpre
import java.lang.System;
import java.lang.String;
class Test //class declaration
//class starts
public static void main(String[] args) //program starting point
//main starts
System.out.println("Hello World"); //printing statement
} //main ends
} //class ends
```

4. What is Class? Explain it.

Ans: - Class is a collection of variables and methods. Class is declared by using class keyword followed by class name. We create variables and methods within the body of class.

5. What is package? Explain it.

Ans: - Package is the collection of classes, interfaces and sub-packages.



India

dial 150mb

Pro India

ial South,

indial 15

ro India

Softpre

tpro Indial

Ans: - JVM stands for Java Virtual Machine. JVM converts byte code to machine code.

8. What is the work of JRE?

Ans: - JRE stands for Java Runtime Environment.

Ans: - The concept of multithreading is to between multiple proces.

J V M converts byte code to machine code.

Line 13 V M converts byte code to machine code.

Process J V M converts byte code to machine code.

Ans: - JRE stands for Java Runtime Environment. The Java Program executes under JRE.

9. What is Multithreading?

Ans: - The concept of multithreading is to between multiple process. processes.

30ftPro Min.

called a softpro India | Softp apro Indial Softpro India So

contro



Technical Tasks:

Olnaia

1. Develop a Java program to print a message "Welcome to the World of Java" on screen.

Ethio mini

dial 150m

```
Pro Indial |Sof
import java.lang.System;
import java.lang.String;
class Test //class declaration
//class starts
public static void main(String[] args) //program starting point
//main starts
System.out.println("Welcome to the World of Java"); //printing statement
} //main ends
} //class ends
```

2. Develop a Java program to find the volume and surface area of cuboid.

```
v=l*b*h;
sa=2*(l*b+b*h+h*l);
```

```
Etpro Indial Sc
                                                    ial | Softpro Indial | Softpro
 import java.util.Scanner;
 class Cuboid
.gat of cuboid: ");

.gat of cuboid: ");

.gat of cuboid: ");

sa=2*(l*b+b*h+h*l);

System.out.println("Volume of cuboid: "+v);

System.out.println("Surface Area of cuboid: "+sa);

}
 public static void main(String [] args)
```



ial |SortPi

indial!

ro Indial

Softpro

oIndial

Softpro

al ISOFTP

```
3. Develop a Java program to calculate simple interest.

import java.ntil c
                                                                                                                                     aouble si;
Scanner sc=new Scanner(System.in);
System.out.print("Enter principle amount : ");
p=sc.nextFloat();
System.out.print("Enter rate : ");
=sc.nextFloat();
'ystem.out.print("Enter time"
=sc.nextFloat();
-sc.nextFloat();
stem
                                                                                                                                                                                                                                                                                                                                                                                                                             Pro Indial | SoftPro In
stpro Indi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ndial Softpro India
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Softpro In
                                                                                                                                              System.out.println("Simple Interest: "+si):
```

4. Develop a Java program to find area and perimeter of circle.

```
Jouble a,p;
Scanner sc=new Scanner(System,in);
System.out.print("Enter radius of circle: ");
r=sc.nextFloat();
a=3.14*r*r;
b=2*3.14*r;
System.out.println("Area of circle ystem.out.println("Perimate of circle ystem.out.prin
SoftPro Ind
```

COL



ndial | SoftPro Inuia 5. Write a Java program to convert given number of days to a measure of time given in years, weeks and days. For example 375 days is equal to 1 year 1 week and 3 days (ignore lean year). ro Indial

ofthio min

Indial 12011

```
S:");
                                           lial |Softpro Ind
                                      dial
                                                        SoftproIndial
              import java.util.*;
stpro India
             class Test
SoftProIndia
                  public static void main(String [] args)
                      αy=(dayno%365)/7;
day=(dayno%365)%7;
System.out.println(year+" Years "+week+" weeks "+day+" days");
                       int dayno, year, week, day;
al Softpro India
Softpro India | Softpro India | Softpro India | Softpro India | Softpro India |
         apro Indial Softpro Indial Softpro Indial Softpro Indial
```



Interview Question: -

1. What is present version of Java and initial version of Java?

Ans: - Initial Version: Java 1.0 Present Version: Java 17

2. How many modifiers are there in Java and how many keywords are there in Java?

Ans: - In Java programming language, there are 11 modifiers and 50 keywords.

3. What was the initial name of Java and present name of Java?

Ans: - Initial Name: OAK Present Name: Java

4. Can we have multiple public classes in single source file?

Ans: - No, we can't create multiple public classes in single source file.

5. Can we create multiple objects for single class?

Ans: - Yes, we can create multiple objects for single class.

6. What do you mean by token and literal?

Ans: - Java tokens are smallest elements of a program which are identified by the compiler. Tokens in Java include identifiers, keywords, literals, operators and separators.

7. What do you mean by identifier?

Ans: - Any name in the Java program like variable name, class name, method name, interface name is called identifier.

8. In Java, program starts from which method and who calls that method?

Ans: - Java program starts from main method. When the Java interpreter executes an application (by being invoked upon the application's controlling class), it starts by calling the class's main method.

9. What are the commands required for compilation and execution?

Ans: - For compilation: - javac filename

For execution: - java classname

10. The compiler understandable file format and JVM understandable file format?

Ans: - Compiler understandable file - .java

JVM understandable file - .class

11. What is the difference between path and class path?

Ans: - Once you install Java on your machine, it is required to Set the PATH environment variable to conveniently run the executable (javac.exe, java.exe, javadoc.exe, and so on) from any directory without having to type the full path of the command. Classpath is a system environment variable used by the Java compiler and JVM. Java compiler and JVM use classpath to determine the location of required class files.



Indial | Softpro India

12. What do you mean by open source software?

Olnaia

Ans: - The source code of open source software is available for all software vendors. The software engineer can modify open source software.

FLDIO MINI

13. What operations are done at compilation time and execution time?

erts (Softpro India) Ans: - Java compiler convert source code to byte code at compilation time and JVM converts Pro Indial | SoftPro India | SoftPro In byte code to machine code at run time.

14. What is the purpose of JVM?

Ans: - JVM converts byte code to machine code.

15. JVM is platform dependent or independent?

Ans: - JVM is platform dependent.

16. In Java, program execution starts from?

Ans: - Java program execution starts from main() method.

17. What does a .class file contains?

Ans: - .class file contains byte code.

18. Is null is a keyword or not?

Ans: - null is not a keyword, it is a literal.

19. Is it possible to declare multiple classes with main method?

and. Indial Softpro In Softpro Indial Softpro **Ans:** - Yes, it is possible to declare multiple classes with main method. Softpro Indial Soft

20. What is the default package in java?

Ans: - java.lang is the default package in java.

21. Is empty java source file is valid or not?

Ans: - Yes, empty java source file is valid.

22. Is it java file contains more than one class?

Ans: - Yes, java file can contain more than one class.

23. What is the purpose of variables in java?

Ans: - Variables are value containers.

24. How many types of variables are there in java and what are those variables?

Ans: - In java programming language there are four types of variables: -

static variables i.)

iii.) non-static variables

local variables

iv.) parameters

Atpro Indial 18

SoftProIndia



828

(vo)	dia coffee	90,	11
Collet	170 150	70	J
1150	iple Choice Questions: - Which component is used to compile, debug and execute a Java program? a) JVM b) JDK c) JIT d) JRE Which component is responsible for converting bytecode into machine specific code a) JVM b) JDK c) JIT d) JRE Which component is responsible to run java program? a) JVM b) JDK c) JIT d) JRE Which statement is true about java? a) Platform independent programming language b) Platform dependent programming language c) Code dependent programming language d) Sequence dependent programming language	8P?	
12/	the often the	SOPTPHG NOM	, n (
150	The last of the same of the sa	al cr	(0)
<u>Mult</u>	<u>iple Choice Questions: -</u>	, 401	1
297cm 1.	Which component is used to compile, debug and execute a Java program?	1/2	
111	a) JVM	112'	- E1
112	b) JDK	10.	20,
MOI	c) JIT		
OTT	d) JRE	710	-
2.	Which component is responsible for converting bytecode into machine specific code	? The	10
100	a) JVM	0	1
40	b) JDK	910	
CLOZ	c) JIT	Tire	12,
Trans.	d) JRE	nto	1:10
3.	Which component is responsible to run java program?	()	Orz
ELL.	a) JVM	*O 11	
50	b) JDK	CYOL	
ton	c) JIT	COLUI	10
COLLE	d) JRE	20) >
4.	Which component is responsible for converting bytecode into machine specific code a) JVM b) JDK c) JIT d) JRE Which component is responsible to run java program? a) JVM b) JDK c) JIT d) JRE Which statement is true about java? a) Platform independent programming language b) Platform dependent programming language c) Code dependent programming language d) Sequence dependent programming language Which of the below is invalid identifier with the main method? a) public	ELG	
2 0	a) Platform independent programming language	(2010)	
(00)	b) Platform dependent programming language	1 10	250
110	c) Code dependent programming language	r, 256	X
112	a) Sequence dependent programming language	150	
ndial So	Which of the below is invalid identifier with the main method?	2	CX
	a) public	gra c	OL
210	b) static	, 15)
Pico	c) private	112	
o Indial	d) linai	Maria	C
tpro India.	a) JVM b) JDK c) JIT d) JRE Which statement is true about java? a) Platform independent programming language b) Platform dependent programming language c) Code dependent programming language d) Sequence dependent programming language Which of the below is invalid identifier with the main method? a) public b) static c) private d) final What is the extension of java code files? a) .class b) .java c) .txt d) .js	111	1-
O II.	a) .class	7,19	8
1010	b) .java	1200	
15	c) .txt	10	. 0
40 1	u) .js	6,	Mor
CYP 7.	What is the extension of compiled java classes?	Tire	
Softpro In	a) .class	war.	1
7	b) .java	Still .	Cal
ELL	d) is	,0	Tr.
150	b) .java c) .txt d) .js	Croze	
al Softe	Which statement is true about java? a) Platform independent programming language b) Platform dependent programming language c) Code dependent programming language d) Sequence dependent programming language Which of the below is invalid identifier with the main method? a) public b) static c) private d) final What is the extension of java code files? a) .class b) .java c) .txt d) .js What is the extension of compiled java classes? a) .class b) .java c) .txt d) .js	Softpro	139
	Softpro India Computer Technologies P Ltd	Page 21	10
			41/



GOTT THE SECTION OF THE PROPERTY	2
SPICE	
19 266 May 20, 10, 120	406
Some Van College Colle	6,
Answer Key: -	
1. b 2. a 3. d 4. a	
5. c 6. b 7. a	61
rial crost dia cotte mail	,00
mar cold the 150 mon	
of the total and the state of t	
Fill in the blanks questions: -	10
601	1
1. The output of the Java compiler is known as	
Ans: - Byte Code.	13,
2. The statement is used to include another Java package in a Java source file.	. 0
Ans: - import	770
3. Java supportsprogramming.	
Ans: - Multithreaded	
	3
4. The output of the Java compiler is executed by the	Tr.
Ans: - JVM	
5. Java byte code output from the JDK compiler will be placed into a file withextension. Ans:class	l l

Fill in the blanks questions: stpro ir

- Softpro 2.
- 4. The output of the Java compiler is executed by the --------.
 Ans: JVM
 5. Java byte code out 5. Java byte cod Ans: - .class apro Indial Softpro India Softpro



Indial

Java Lecture - 02

FLDLO IIIM

Etpro Indial 12011 (Decision Controls In Java)

ndial | SoftPro Long Answer Questions: -

1. What is Decision Control and what is the purpose of Decision Control?

Softpro Indial Softpro Indial Softpro Indial Softpro Indial Ans: - Decision Controls are used for decision making. If you have a block of code which you want to execute based on some condition, then you can use decision control. In Java programming language there are following types of decision controls: -

- if statement
- ii.) if-else statement
- iii.) nested if - else statement
- ladder if else statement iv.)
- v.) switch statement
- Write short notes on the following:
 - if statement
 - ii. if-else statement
 - nested if else statement
 - ladder if else statement iv.
 - switch statement

Ans: -

Softp

oIndial

I Softpro

ro Indial Softpro India dial Softpro In if statement: - if is a keyword which works as decision control. We attach a condition no Indial Soft with if statement. If given condition is true, then the code will be executed and if given condition is false then the code will not be executed. The syntax of if statement is given Jial Softpro below: -Indial

```
if(condition)
//code
```

tpro India Softpro India dial | SoftPro India if - else statement: - if-else is the variation of if statement. We attach a condition with if statement, if given condition is true then the if block code will be executed and if given condition is false then the else block code will be executed. ro Indial 15

The syntax of if – else statement is given below: -

```
if(condition)
//if block code
```

Softpro



```
{
//else block code
}
estr
```

- else {
 // Jial Softpro India 1 100's **nested if – else:** - if you use if – else construct inside if block or else block or both blocks
- stpro India ladder if - else statement: - If you have many conditions and you want to execute code -ela based on those conditions, then you can use ladder if - else. Syntax of ladder if - else is SoftproInd ro Indial Softpro India given below: -

```
{
//code3
}
else if (condition2)
{
//code2
```

al Softpro

o Indial

Softpro

- Jial Softpro In ndial SoftP switch statement: - switch is a keyword which works as case control. It is used to make a menu based program.

 the purpose of switch statementary.
 - What is the purpose of switch statement? Write the syntax of switch statement.

Ans: - switch statement: - switch is a keyword which works as case control. It is used to make a Softpro India | Softpro India | Pro Indial | SoftPro Indial | S menu based program. The Syntax of switch statement is given below: -

```
Indial | Softpro Indial | S
switch(expression) //int or char or String
case 1:
//code1
break;
case 2:
//code2
break;
default:
//code
break;
```



Short Answer Questions: -

1. What is the difference between if and if-else?

Ans: - In if statement, we attach a condition, if given condition is true then the code will be executed and if given condition is false then the code will not be executed. Whereas in if – else statement we attach a condition with if statement, if given condition is true then if block code will be executed and if given condition is false then else block code will be executed.

What is the purpose of conditional operator?

Ans: - The conditional operator is alternate of if - else statement. The syntax of conditional operator is given below: -

(expression1)?(expression2): (expression3);

If expression1 is true then expression2 will be executed and if expression1 is false then expression3 will be executed.

What is the difference between ladder if – else and switch?

Ans: - In else if ladder, the control goes through every else if statement until it finds true value of the statement or it comes to the end of the else if ladder. In case of switch case, as per the value of the switch, the control jumps to the corresponding case.

What is the difference between conditional statement and if - else?

Ans: - The java ternary operator or conditional operator is supported in languages such as Java, Javascript, Python, C / C++, C# etc. The java ternary operator or conditional operator takes three operands, one condition followed by a question mark (?), then an expression to be executed if the condition is true followed by a colon (:), and the expression to be executed if the condition is false. It is similar to "if else" statement.

Write syntax of ladder if – else.

```
India | Softpro India | Softpro India |
                  Softpro India | Softpro India | Soft
Ans: - Syntax of ladder if – else is given below: -
if(condition1)
//code1
else if (condition2)
//code2
else
//code3
```

ial | SoftPro India



Technical Tasks: -

50

Olnaia

1. Develop a program in Java to check whether the given number is Even or Odd.

dial 150m

```
Indial |Softpro Indial |Softpro Indial |
                                 ro Indial | Softpro India
import java.util.Scanner;
                              Softpro Indial Softpro Indial Softpro Indial Softpro Indial
class Test
public static void main(String [] args)
{
int
int n:
Scanner sc=new Scanner(System.in);
System.out.print("Enter a number : ");
n=sc.nextInt();
if(n\%2==0)
System.out.println("Number is even");
else
System.out.println("Number is odd");
```

Storo Min.

2. Develop a program in java to find roots of quadratic equation $ax^2+bx+c=0$. Hint: - To find square root use Math.sqrt() method. Math is a built-in class in java.util package.

```
India | Softpro India | Soft
import java.util.*;
                                            Indial | Softpro Indial | S
public static void main(String [] args)
{
double a b c d d
                                                             SoftproIndia
Scanner sc=new Scanner(System.in);
System.out.println("Enter value for a,b and c");
a=sc.nextDouble();
b=sc.nextDouble();
c=sc.nextDouble();
d=(b*b-4*a*c);
if(d<0)
System.out.println("Roots are imaginary");
```



```
ndial | Softpro Invia
                 -\(\tau-\text{p}+\text{Math.sqrt(d)}\)/(2*a);

r2=(-b-Math.sqrt(d))/(2*a);

System.out.println("Root1: "+r1);

System.out.println("Root2: "+r2);

}
                                                              Softpro Indial Softpr
                                             Indial |Softpro Indial
                                                                              pro India | Sof
Stpro India
```

ndial Softpro India Develop a program in Java to accept basic salary from user and calculate gross salary on following basis: -1:10

ELL	BASIC	HRA	DA
50	1 – 4000	10%	50%
COELE	4001 – 8000	20%	60%
150	8001 - 12000	25%	70%
a' coft	12000 and above	30%	80%

ro Indial

Softpro

oIndial

al Softp

```
tstatic void main(String [] args)

double bs,hra,da,gs;
Scanner sc=new Scanner(System.in);
System.out.print("Enter basic salary: ");
bs=sc.nextDouble();
if(bs<=4000)

ra=bs*10/100;
a=bs*50/100;
e;**</pre>
                     ...n);
...e salary:");

...s*10/100;
da=bs*50/100;
}
else if(bs>4000 && bs<=8000)
{
bra=bs*20/100;
la=bs*60/100;
ndial Soft
                                                Softpro India | Softpro India | Softpro India |
tpro India
                                                                                           ial | Softpro India
SoftproIn
```



```
ndial | Softpro Invia
                         ro Indial |Softpro India | Jou
                                    Indial Softpro Indial
                                Indial |Softpro India
            else if(bs>8000 && bs<=12000)
                                                Softpro India | Soft
             else
                                                        Atpro Indial 19
             hra=bs*30/100:
            da=bs*80/100;
             gs=bs+hra+da:
             System.out.println("Gross Salary="+gs);
```

dial 150m

ro Indial

ndial

oIndial

Softpro

Softpro Develop a Java program to accept a coordinate point in an XY coordinate system and determine al Soft

```
Pro India | SoftPro India | Soft
                         Indial | Softpro Indial | S
                                  1Softpro India
System.out.println("Third Quadrant");
else if(x>0 && y<0)
System.out.println("Fourth Quadrant");
```



```
ndial | Softpro Invia
         Boftpro Indial 150111
                              SoftPro India, 100,
```

Stpro Him

ro Indial 5. Develop a Java program to accept number of units consumed and calculate electricity bill: -

1.7		
4O 3	Unit	Bill/Unit
7.	1-150	2.40
100	For next 151-300	3.00
2 /1.	For next more than 300	3.20
200	112 (20)	71.0 July 10
ELP.	Office Color	100
1	import java.util.*;	110
0.0	class Test	412

```
acouble unit,bill;
Scanner sc=new Scanner(System.in);
System.out.print("Enter number of units consumed:");
unit=sc.nextDouble();
if(unit<=150)

ill=unit*2.40;
se if(unit>150 & p
                                                                                                                                                                                                                                                           ial Softpro Indial Softpro India
                                                                                                                                                                                                                                                                                                              Softpro Indial Softpro In
                                                                                                                                                                                                                                                                                                           dial Softpro Indial Softpro
                                                                                                                                                                                                                                                                                                                                                                                                     oftpro India | 150ft
                                                                                                    bill=(150*2.40)+(unit-150)*3.00;
                                                                                                    else
                                                                                                                                                                                                                                                                                                                                                   Indial Softpro India Softpro India
tpro India
                                                                                                   bill=(150*2.40)+(150*3.00)+(unit-300)*3.20;
                                                                                                    System.out.println("Your bill="+bill);
```

6. Develop a Java program to make a simple calculator using switch.

al Softe

ndial 150

o Indial

Softpro

al Softs

```
SoftproIndia
import java.util.*;
class Test
public static void main(String [] args)
```



```
ndial | Softpro Inuia
                                                                                                                                                                                                                                                                                                                    dial 150m
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Softpro III
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Softpro India, 100,
                                                                                                                                                                                                                            India | Softpro India | Softpro India | Softpro India | Softpro India | India | Softpro India 
                                                                                                                                                              ...o numbers");

Jac();

Jacem.out.println("1-> Addition");

System.out.println("2-> Subtraction");

System.out.println("3-> Multiplication");

System.out.println("4-> Division");

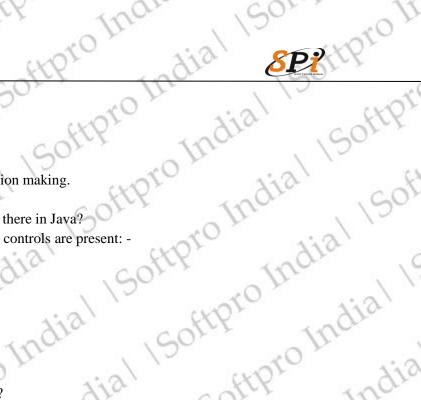
ch=sc.nextInt();

switch(ch)

ase 1:
                                                                                                                                                                                                                                                                          India | Softpro India | Softpro India | Softpro India |
                                                                                                                                                                                                                                                                                                                                                                                                                       Softpro Indial Softpro India Softpro
strpro Indi
                                                                                                                                                            oreak;
}
System.out.println("Result="+res);
}
Softpro India | Softpro India | Softpro India | Softpro India | Softpro India |
                                                                                                                     apro Indial Softpro India So
```

ro Indial

Softpro



Interview Questions: -

ial SoftP

1. What is Decision Control?

to India.

dial 150mb

50ftpro mu.

4. Does the Switch allow String argument or not?

What are the allowed arguments of switch?

Ans: - In switch int, char & string arguments are allowed.

Does the Switch allow String argument or not?

Ans: - Yes, switch allows String argument

side the switch statements sible?

s: - ' 5. Inside the switch statement, how many cases are possible and how many default declarations are

Ans: - Inside the switch statement, any number of cases are possible but only one default declaration is possible.

6. We are able to use break statements in how many places and what are those places?

ava?

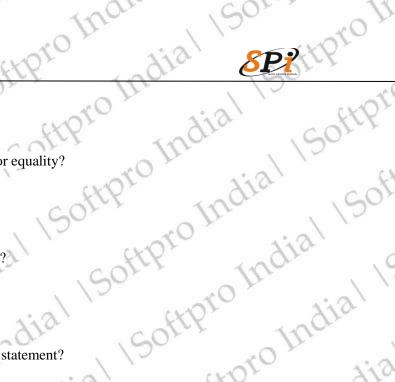
.i:

Gottoro india | Gottoro Ans: - The break statement has two separate and distinct uses: exiting a loop and exiting a switch statement. You cannot use break anywhere else except inside a loop or a switch statement.

- 7. What do you mean by transfer statements and what transfer statements are present in java? Ans: - Java provides six language constructs for transferring control in a program: Goro Indial Softpro Indial Softpro Indial Softpro Indial Softpro Indial Softpro India Softpro India

Softpro

Al Softpro



Multiple Choice Questions:

to India

1. Which of these selection statements test only for equality?

1 South

Horo mini

ro India

oIndia

- b) switch
- c) if & switch
- d) none of the mentioned
- 2. Which of these are selection statements in Java?
 - a) if()
 - b) for()
 - c) continue
 - d) break
- Indial | SoftPro Indial | Soft 3. Which of the following is used with the switch statement?
 - a) Continue
 - b) Exit
 - c) break
 - d) do
- 4. What is true about a break?
 - a) Break stops the execution of entire program
- ial Softpro Indial 19 b) Break halts the execution and forces the control out of the loop
- SoftPro India Softpro Indial Softpro In Jump statement?

 Jump statement?

 d) return

 Which of the following is not a valid flow control statement?

 a) exit()

 b) break

 continue

 return

 Key: c) Break forces the control out of the loop and starts the execution of next iteration
- (d) Break halts the execution of the loop for certain time frame
- 5. Which of the following is not a decision making statement?

 a) if

 - d) return

d) do-while 6. Which of the following is not a valid jump statement? a) break b) goto c) continue d) return 7. Which of the following is not a valid flow control statement? a) exit() b) break c) continue d) return Answer Key: - 1. b 2. a 3. c 4. c 5. d 6. b 7. a	b) if-else	Ala	FILE	300	, 90) >
6. Which of the following is not a valid jump statement? a) break b) goto c) continue d) return 7. Which of the following is not a valid flow control statement? a) exit() b) break c) continue d) return Answer Key: - 1. b 2. a 3. c 4. c 5. d 6. b 7. a	c) switch	100	100,	JI.	110	
a) exit() b) break c) continue d) return Answer Key: - 1. b	d) do-while	0 1	110	210	1:2	CX
a) exit() b) break c) continue d) return Answer Key: - 1. b	6. Which of the follo	wing is not a valid jun	np statement?	CV'	gro	CO1,
a) exit() b) break c) continue d) return Answer Key: - 1. b	a) break	1000	(60)	10	, ,	12
a) exit() b) break c) continue d) return Answer Key: - 1. b	b) goto	OTT	1/2	40		
a) exit() b) break c) continue d) return Answer Key: - 1. b	c) continue	100	112	CLO	910	0
a) exit() b) break c) continue d) return Answer Key: - 1. b	d) return	17	2011	Ores	100	. 15
Answer Key: - 1. b 2. a 3. c 4. c 5. d 6. b 7. a	7. Which of the follo	wing is not a valid flo	w control statement?	2) }	9/ /
Answer Key: - 1. b 2. a 3. c 4. c 5. d 6. b 7. a	a) exit()	200	122	CKOT	21	0
Answer Key: - 1. b 2. a 3. c 4. c 5. d 6. b 7. a	b) break	ELF.	- adje	COLLE	100	
Answer Key: - 1. b 2. a 3. c 4. c 5. d 6. b 7. a	c) continue	90,	111	1150	10 h	1
1. b 2. a 3. c 4. c 5. d 6. b 7. a	d) return	1	0	11	OI	7,10
1. b 2. a 3. c 4. c 5. d 6. b 7. a	Anguan Vanit A	CLD,	970	- at	1	200
5. d 6. b 7. a	Answer Key: -	, CO101	120	, 150	.01	
thought 12011 120 In 1910 I	1b	2. a	3. c	4. c	2000	4
thought 12011 120 In 1910 I	5. d		The state of the s	770	477	3
croro Inc. dial Se Oftpro Indial Coftpro	16, 91	CO)	11	100	30	JI.
croro dia cettero india cofte	Tor Wille	1/20	40 }	11,	~~~	0
Cho, 410 Coppe 100, CO,	40		CHOI	210	ELL.	
	CKOT	710	JEST .	120	(00)	



× .	rote dia	ofth was	0,5	01.
. 00	Lice Page 15	20, 11.	1	TOTO
1/12	noro tial	ELPI	910	8Pi
10	Coffe Thorn	120,	Tile	130
()	Fill in the blanks Ouestions: -	Chore	112	ELL.
110	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	GOTTE	Tro	, 150
non	Ans: - boolean	as input before bra	ancning.	12/ 61
4.3	al cross	ia, coff	7, 100	1201
100	2. An if statement in Java is also a Ans: - conditional	statement.	TO L	2
40 Tr	is all supro	112	ELB.	"gra
*	3. Java style if-else statements are simil Ans: - Both C and C++ style	ar to	,0	11.
~O)	This. Both 6 and 611 style	122	ELPI	gia.
ELPI	4. An else statement must be preceded by	by statemen	t in Java.	Trie
),,	Alis If and else if bour	10 h	CVC	1,0
CXO	5statements test only fo	or equality.	GOLL	The
COLLI	Ans: - switch	Oliv	1/3	010
10	word dial	CKDIC 3	ia, co	15ch 10
GO	The man S	Ore, Till	1/2	310
1/20	200	croto	110	Eth.
9,	afth todie	Cott	aug !	50
,)	50 40 11	1/2 mro	112	666,
112	they agree	COLLA	TOOL	150,
Corr	120,	1120	10	al cr
450	al crose 3	lia, Etc	5, 209,	1001
1207	Corr, Tu	1150	*O)	
Or	Fill in the blanks Questions: - 1. An if or else if statement accepts Ans: - boolean 2. An if statement in Java is also a Ans: - conditional 3. Java style if-else statements are simil Ans: - Both C and C++ style 4. An else statement must be preceded to Ans: - if and else if both 5 statements test only for Ans: - switch	110	446,	odia c
* **	idia Goiti	140, 110	2),	1,
*O)	The state of the s	112	CLOIC	dia,
+PI	dia coffe	100,	COLLI	The
7.01	The 12c	10	(10)	io dia
CYOY	dia ser	y way	COLLE	Tro
COLLI	Inc. 120	TO II	. 2/10	· oro
	Ans: - Both C and C++ style 4. An else statement must be preceded by Ans: - if and else if both 5statements test only for Ans: - switch	EX6, ~9	To Co	LLK INC
CO	That 120	O. Tire	1/20	200
1000		-10	4 5 2	(14) >



roIndial

Indial | Softpro Indial | Softpro

Java Lecture -03

FTPTO IIILL

EtPro Indial Don't (Loop Controls In Java)

ndial | SoftPro Long Answer Questions: -

- 1. What is the purpose of Loop Controls? How many types of loop controls are there in Java? Softpro Indial 19 Ans: - Loop Controls: - If you have a block of code which you want to execute repeatedly up to the given condition is true, then you can use a loop control. There are four types of loop controls Jial Softpre pro Indial in java:
 - while loop
 - ii.) for loop
 - iii.) do-while loop
 - iv.) for each loop
- What is the difference between while and do while loop?

ro India | Softpro India | Softpro In Ans: - While is an entry loop control whereas do-while is an exit loop control. In while loop, first condition is tested then code is executed whereas in do-while loop, condition is tested after lial | Softpro execution of code.

Syntax of while loop: -

```
Initialization of loop counter;
while(condition)
//code
Updation of loop counter
```

Syntax of do-while loop: -

```
Initialization of loop counter;
//code
Updation of loop counter;
while(condition);
```

3. What is the difference between for loop and for each loop?

ial SoftPro Indial Soft Ans: - For loop: - for is a keyword which works as loop control. The working of for loop is same as while loop but syntax is different. The for loop is an entry control. The syntax of for loop is given below: -

```
for(Initialization of loop counter; Condition; Updation of loop counter)
```



```
indial | Sof
      //code
```

ial SoftP

ro Indial

Softpro

SoftPro India 1 100's pro Indial Softpro Indial For each loop: - for each loop is a special loop control. It is used to traverse the elements of a .a use fo collection. E.g. if you want to traverse the elements of an array you can use for each loop.

adial Softpro municipality

```
strpro India
 int [] x = \{10,20,30,40,50\};
for(int n:x)
 System.out.println(n);
```

Pro maio

Short Answer Questions: -

ndial Softpro Indial Softpro SoftPro India while loop: - while is a keyword which works as loop control. while is an entry loop control. The syntax of while loop is given below: dial | Softpro Indi Indial |Softpro SoftPro Indial lial 190

```
Initialization of loop counter;
  while(Condition)
//code
 Updation of loop counter;
```

2. Explain for each loop with an example.

Softpro Indial 15 For each loop: - for each loop is a special loop control. It is used to traverse the elements of a collection.

aoop. , you c E.g. if you want to traverse the elements of an array you can use for each loop. int [] $x = \{10,20,30,40,50\};$ for(int n:x) System.out.println(n);

3. for (; ;) represents?

tpro Ind Ans: - It's an infinite loop, equivalent to while(true). When no termination condition is provided, the condition defaults to true.



4. Explain do-while loop with example.

Pro India

ial |SortPi

indial 19

roIndia

Softpro

al Soft

ndial

Ans: - do-while is an exit loop control. In do-while loop condition is tested after execution of code. If you have a code which you want to execute at least one time either condition.

For atic aon is truston is truston. dial Softpro Indial Soft

HPro IIIu

dial 12011

```
one the state of t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tpro India
                                                                                                                                                                                                                                                                                                                                                                                                  E.g.
                                                                                                                                                                                                                                                                                                                                                                                                  int i;
stpro India
                                                                                                                                                                                                                                                                                                                                                                                                  do
                                                                                                                                                                                                                                                                                                                                                                                                  System.out.println(i);
```

5. Explain for loop with example.

Softpro Indial 18 Ans: - For Loop: - for is a keyword which works as loop control. The working of for loop is same as while loop but syntax is different. The example of for loop is given below: - for(int $i=1;i \le 10;i++$) adial Softpro In Etpro Indial Sc iftpro Ind

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

The above code will display numbers from 1-10.

6. Explain nested for loop with an example. oIndial

Softpro tial Softpro Indial Softpro India So and ne. ..other Softpro India | Softpro India | Softpro India | Ans: - Nested for loop: - If we use a for loop inside another for loop. It is called nested for loop.

con



Indial 150m Technical Tasks: -

pro India

ial |SortPi

indial

roIndia

Softpro

al SoftP

o Indial

Softpro

al Soft

Htpro India, 100, 1. Develop a java program to print the table of a given number in given format like: -

```
Indial Softpro Indial Softpro
               ... n,i;

Scanner sc=new Scanner(System.in);

System.out.print("Enter a number to print table : ");

n=sc.nextlnt();

for(i=1;i<=10;i++)

{

System.out.println(n+"*"+i+"="]
                                         al of
stpro Indi
                                             Jial Softpro Indial Softpro In
```

Softpro III.

ndial 150 2. Develop a java program to find factorial of given number.

```
Softpro India | Softpro
      Softs

Softs

Softs
tpro India
```



3. Develop a java program to find sum of digits of given number.

dial 150m

pro moua

ial |SoftPi

indial

ro Indial

Softpro

oIndial

Softpro

al Softp

```
...ain(String [] args)

...a n,r,s=0;
Scanner sc=new Scanner(System.in);
System.out.print("Enter a number to find sum of digits: ");
n=sc.nextInt();
while(n>0)
{
=n%10;
=s+r;
=n/10;
n=n/10;
}
System.out.println("Sum of digits="+s);
}
bevelop a java program te
```

Ethio mini

al Softs

```
int n,r,rev=0;
Scanner sc=new Scanner(System.in);
System.out.print("Enter a number : ");
n=sc.nextInt();
while(n>0)
{
=n%10;
    v=rev*10+r;
    :n/10;
4. Develop a java program to reverse the digits of given number.

import java.util.*;
class Test
                                                ro India | Softpro India | Softpro India |
                  System.out.println("Reverse of digits="+rev);
}
tpro India
                                                                                          Goftpro Ind
```

10

COLL



5. Develop a java program to convert a binary number to its decimal equivalent.

dial 150m

ial |SoftPr

ndial

ro Indial

Softpro

oIndial

Softpro

.pro India

```
____em.in);
__a binary number : ");

____num>0)

{
rem=num%10;
dec=dec+rem*(int)Math.pow(2,n);
n++;
num=num/10;

ystem.out.println("P
                                                   ro Indial | SoftPro Indial | SoftPro
```

Etpro mini

6. Develop a java program to generate Fibonacci Series up to N terms, where value of N is entered

```
...n(String [] args)

...n(String [] args)

Scanner sc=new Scanner(System.in);
System.out.print("How many terms you want in series? ");
n=sc.nextInt();
System.out.print(n1+" "+n2+" ");
*or(i=1;i<=n-2;i++)

3=n1+n2;
ystem.out.print(n2)
=n2;
                                   Softpro India | Softpro India | Softpro India |
                                Softpro India
 n1=n2;
 n2=n3;
```



7. Develop a java program to check whether the given number is prime or not.

dial 150m

ial |SoftPi

indial

ro Indial

al Softe

Softpro

al Softk

Pro India

```
SoftPro Indial SoftPro
                                                                                                                                                                                                                                                                 dial SoftPro
                                                                                                                                                                                                              30ftpro Indial Softpro India Softpro 
 import java.util.*;
 class Test
                                                                                                                                                                                                                                       Softpro Indial Softpro India Softpr
  public static void main(String [] args)
 int n,i,c=0;
  Scanner sc=new Scanner(System.in);
  System.out.print("Enter a number to check prime or not: ");
                                                                                                                                                                                                                                                                                   Softpro Indial Softpro India
                                                                          Idial | SoftPro In
  n=sc.nextInt();
  for(i=1;i \le n;i++)
 if(n\%i==0)
   if(c==2)
System.out.println(n+" is prime");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indial Softpro
  else
 System.out.println(n+"\ is\ not\ prime");
```

Etpro III.

8. Develop a java program to print the series of prime number in given range.

```
...er sc=new Scanner(System.in);
system.out.print("Enter lower limit:");
l=sc.nextInt();
System.out.print("Enter upper limit:");
u=sc.nextInt();
for(i=l;i<=u;i++)
```



```
ndial Softpro Indial Softpro India Softpro Ind
o Indial Softpro India So
Apro India | Softpro India | S
Softpro India | Softpro India |
Softpro India | Softpro India | Softpro India | Softpro India | Softpro India |
```



Interview Questions: -

1. What is the purpose of looping statements?

Olnaia

Ans: - If you have a block of code which you want to execute repeatedly up to given condition is true then you can use a loop control.

Storo Mini

- What is the default condition of for loop?
 - **Ans:** The default condition of for loop is true.

tial 150mi

- Inside "For Loop", initialization, condition & increment/decrement parts are optional or mandatory?
 - Ans: Inside for loop, initialization & condition & increment / decrement parts are optional.
- What do you mean by transfer statements and what transfer statements are present in java?
 - Ans: The transfer statements are the control statements which transfer the program execution control to a specific statement. Java provides six language constructs for transferring control in a SoftproIndia Indial |Soft program: SoftproIn
 - break
 - ii. continue
 - iii. return
 - iv. try-catch-finally
 - v. throw
 - vi. assert
- 5. When will we get compilation error like "unreachable statement "?
 - Ans: An unreachable Statement is an error raised as part of compilation when the Java compiler detects code that is never executed as part of the execution of the program.
- Softpro India Is it possible to declare while loop without condition yes? If yes, what is the default condition and if no, what is the error? ro Indial | Softpro Indial | S
- Ans: No, it must have a valid boolean expression inside the () parentheses. Goro Indial | Softpro Indial | Softpro Indial | Softpro Indial | Softpro India Softpro Indial | Softpro

Jial | SoftPro India



Multiple Choice Questions:

to India

dial Sof 1. Which of the following loops will execute the body of loop even when condition controlling the loop is initially false?

HADEO MINI

Jial 15011

- a) do-while
- b) while
- c) for

ro India

Softpre

- d) none of the mentioned
- SoftproIndial , the 1 Which of these jump statements can skip processing the remainder of the code in its body for a Indial Soft particular iteration?
 - a) break
- b) Break halts the execution and forces the control out of the loop
 c) Break forces the control out of the loop and starts the execution of next iteration
 d) Break halts the execution of the loop for certain time frame

 What is true about do statement?
 a) do statement executes the code of a 1
 b) do statement does part
) do statement does part
- 4. What is true about do statement?

 - b) do statement does not get execute if condition is not matched in the first iteration c) do statement checks the condition at the basis is

 - Which of the following is not a valid jump statement?

 a) break
 b) goto
 c) continue
 d) return d) do statement executes the code more than once always

 - c) continue

()	break forces the control out of the loop and starts the execution of next iteration
d)	Break forces the control out of the loop and starts the execution of flext fleration. Break halts the execution of the loop for certain time frame. That is true about do statement? do statement executes the code of a loop at least once do statement does not get execute if condition is not matched in the first iteration do statement checks the condition at the beginning of the loop do statement executes the code more than once always. Thich of the following is not a valid jump statement?
4. W	The Color May 120
4. W	hat is true about do statement?
a)	do statement executes the code of a loop at least once
b)	do statement does not get execute if condition is not matched in the first iteration
c)	do statement checks the condition at the beginning of the loop
d)	do statement executes the code more than once always
	THE THE COL
5. W	hich of the following is not a valid jump statement?
a) b) c)	that is true about do statement? do statement executes the code of a loop at least once do statement does not get execute if condition is not matched in the first iteration do statement checks the condition at the beginning of the loop do statement executes the code more than once always hich of the following is not a valid jump statement? break goto continue return Ter Key: - a 2. d 3. b 4. a 5. b
b)	goto
c)	continue
(d)	return
O II	1 1 ard tial cross dia
d) Answ	is the adjust the
Answ	er Key: - 501111
77.0	10 -10 110
1.	a 2. d 3. b 4. a 5. b
EKP	-dir (-0)11
CO1 1	110 100
10	110 110
CKO	The copies they con The
COLUL	100
190	a 2. d 3. b 4. a 5. b
our li	er Key: - a 2. d 3. b 4. a 5. b
SoftPro 1	
	Softpro India Computer Technologies P Ltd Page 43



Fill in the blanks: - 1. Java provides	star dia, cofth man bor of
1. Java provides basic looping control structures. Ans: - four 2. The first executes the block of statements and then checks the condition. Ans: - do-while loop 3. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection 4. The for loop is also called an Ans: - Entry controlled loop. 5. The determines the increment or decrement of the loop control variable unless the test condition becomes false. Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection	Sorry Title Parton
1. Java provides basic looping control structures. Ans: - four 2. The first executes the block of statements and then checks the condition. Ans: - do-while loop 3. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection 4. The for loop is also called an Ans: - Entry controlled loop. 5. The determines the increment or decrement of the loop control variable unless the test condition becomes false. Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection	al core
1. Java provides basic looping control structures. Ans: - four 2. The first executes the block of statements and then checks the condition. Ans: - do-while loop 3. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection 4. The for loop is also called an Ans: - Entry controlled loop. 5. The determines the increment or decrement of the loop control variable unless the test condition becomes false. Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection	1201 Inc. 120 10 10 1101
Ans: - four 2. The first executes the block of statements and then checks the condition. Ans: - do-while loop 3. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection 4. The for loop is also called an Ans: - Entry controlled loop. 5. The determines the increment or decrement of the loop control variable unless the test condition becomes false. Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection	Fill in the blanks: -
 The first executes the block of statements and then checks the condition. Ans: -do-while loop The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection The for loop is also called an Ans: - Entry controlled loop. The determines the increment or decrement of the loop control variable unless the test condition becomes false. Ans: - The step value The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection 	
Ans: - do-while loop 3. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection 4. The for loop is also called an Ans: - Entry controlled loop. 5. The determines the increment or decrement of the loop control variable unless the test condition becomes false. Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection	Ans: - four
3. The	
depending upon the outcome of the conditional expression. Ans: - selection 4. The for loop is also called an Ans: - Entry controlled loop. 5. The determines the increment or decrement of the loop control variable unless the test condition becomes false. Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection	Ans: - do-while loop
Ans: - selection 4. The for loop is also called an Ans: - Entry controlled loop. 5. The determines the increment or decrement of the loop control variable unless the test condition becomes false. Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection	
 4. The for loop is also called an	
Ans: - Entry controlled loop. 5. The determines the increment or decrement of the loop control variable unless the test condition becomes false. Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection	chore dia, ette, adju com me
 5. The determines the increment or decrement of the loop control variable unless the test condition becomes false. Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection 	
condition becomes false. Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection	the dia the dia court that
Ans: - The step value 6. The statements cause the program control to be transferred to a specific location depending upon the outcome of the conditional expression. Ans: - selection	
depending upon the outcome of the conditional expression. Ans: - selection	
depending upon the outcome of the conditional expression. Ans: - selection	6 The statements cause the program control to be transferred to a specific location
ndia Softpro India Softpro	depending upon the outcome of the conditional expression.
ndia SoftPro India SoftPro	
othdia SoftPro India SoftP	150 1011 110 110 110 110
Softpro India Softpro India	Tigy of the rugical coffet man 120,
Softpro India Softpro India	Vor. 120, 10 11, 1/20 210, 1151, 11
Softpro India Softpro India	rial, those gig, coffe work to
Softpro India Softpro India	man 1201, 1100 1120 120 11
Softpro India Computer Technologies P Ltd Page 44	or is a chore dia, ette, major is
Softpro India Computer Technologies P Ltd Page 44	india Goiri The 120 to II.
Softpro India Computer Technologies P Ltd Page 44	to me all along ties they agree
Softpro India Computer Technologies P Ltd Page 44	the English Copy They Rose of It.
Softpro India Computer Technologies P Ltd Page 44	to it is the dia
Softpro India Computer Technologies P Ltd Page 44	etter agia coppe man coppe
Softpro India Computer Technologies P Ltd Page 44	Sor Tight Crose
Softpro India Computer Technologies P Ltd Page 44	those gia, coffe may come in
Softpro India Computer Technologies P Ltd Page 44	Borry The 12 story
Softpro India Computer Technologies P Ltd Page 44	1 chore fig ofth work court
	Softpro India Computer Technologies P Ltd Page 44
is a cross dia coffe more coster	



Java Lecture - 04

ELDLO Mini

Etpro Indial 130111 oftpro Indial (Concept of Array)

ndial | SoftPro Inuia Long Answer Questions: -

1. What is an array? What is the need of array?

Ans: - An Array is the collection of similar data types that means an array can store multiple values of similar data types.

Need of Array: - Arrays are used when there is a need to use many variables of the same type. It can be defined as a sequence of objects which are of the same data type. It is used to store a ainer: collection of data, and it is more useful to think of an array as a collection of variables of the same type. Arrays can be declared and used. A programmer has to specify the types of elements and the number of elements that are required by an array.

Declaration of Array: -

datatype [] arrayname=new datatype[size];

E.g.

int [] x=new int[10];

The above array can store 10 numbers of int type.

Initialization of Array: -

int [] $x=\{10,20,30,40,50\}$;

The above array stores elements in following manner: -

x[0]=10

x[1]=20

x[2]=30

x[3]=40

x[4]=50

oftpro Indial Softpro In Indial Softpro ro Indial | Softpro Indial | S 2. How many types of array can be declared? How to take input from user for an array?

Declaration of array: -

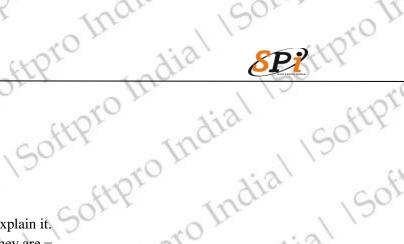
Taking input from user for an array in Java: -

Code Segment: -

int [] x=new int[5];

Scanner sc=new Scanner(System.in);

Jial | SoftPro India



```
System.out.println("Enter five numbers");
for(i=0;i<5;i++)
x[i]=sc.nextInt();
```

to India

3. How many types of array are there in Java? Explain it.

Ans: -There are two types of arrays in Java, they are

1 150TH

Single dimensional array - A single dimensional array of Java is a normal array where the array contains sequential elements (of same type) -

```
int[] myArray = \{10, 20, 30, 40\};
```

Multi-dimensional array - A multi-dimensional array in Java is an array of arrays. A two Softpro India Etpro India dimensional array is an array of one dimensional arrays and a three dimensional array is an array Indial |Soft of two dimensional arrays.

Short Answer Questions: -

ial Softs

Soft

What is the importance of array?

Ans: - Importance of Array: -

- Arrays represent multiple data items of the same type using a single name.
- In arrays, the elements can be accessed randomly by using the index number.
- Arrays allocate memory in contiguous memory locations for all its elements. Hence there is no chance of extra memory being allocated in case of arrays. This avoids memory overflow or shortage of memory in arrays.
- Using arrays, other data structures like linked lists, stacks, queues, trees, graphs etc can be implemented.
- Two-dimensional arrays are used to represent matrices.
- oIndial 2. What is initialization of array?

ro Indial | Softpro Ind , into at Ans: - Initialization of array: - Initialization means to store the values into array with a declaration.

```
as to sto
int [] list={10,20,30,40,50};
list[0]=10;
list[1]=20;
list[2]=30;
list[3]=40;
```

list[4]=50;

Jial Softpro India



3. Describe memory allocation in array.

to India

Ans: - Memory Allocation in Java is the process in which the virtual memory sections are set ant [][] A=new int[3][3];

5. How to take input from user for two dimensional array?

Ans: - Code Segment:
int [][] A=new int [3][3];
int i,j;
Scanner sc=new Scanner^(c)
for(i=0;i<3;i++)
{ aside in a program for storing the variables and instances of structures and classes. However, the Softpro Indial Softpro Indial S

Storo Min.

ial | SoftP

Jia 15011

```
for(j=0;j<3;j++)
        A[i][j]=sc.nextInt();
```

Softpro India | softpro India What are the different ways of copying an array into another array?

Ans: - You can copy one array from another in several ways -

Copying element by element - One way is to create an empty array with the length of the original array and copy each element (in a loop).

Using the clone() method – The clone() method of the class java.lang.Object accepts an object as a parameter, creates and returns a copy of it.

Using the System.arraycopy() method - The copy() method of the System class accepts two Leepts O adia | SoftPro India Softpro India ..e a India Goro Indial Softpi arrays (along with other details) and copies the contents of one array to other.

Jial Softpro



Technical Tasks: -

SoftP

to India

1. Develop a Java program to find sum and average of ten numbers using array.

dial 150m

```
dial Softpro Indial Softpro
                            tpro Indial Softpro India
import java.util.*;
class Test
                               Stepro Indial Softpro Indial S
public static void main(String [] args)
int [] x=new int[10];
int i,sum=0;
double avg;
Scanner sc=new Scanner(System.in);
System.out.println("Enter ten numbers to the list");
for(i=0;i<10;i++)
x[i]=sc.nextInt();
sum=sum+x[i];
avg=(float)sum/10;
System.out.println("Sum="+sum);
System.out.println("Average="+avg);
```

Athro Mini

2. Develop a Java program to take five names as input and display names in alphabetical order.

```
ndial | Softpro India
                               Indial | Softpro In
import java.util.*;
class Test
                                          Indial | Softpro Indial | S
public static void main(String [] args)
String [] name=new String[5];
int i:
Scanner sc=new Scanner(System.in);
                                                          SoftproIndia
System.out.println("Enter five names");
for(i=0;i<5;i++)
name[i]=sc.nextLine();
Arrays.sort(name);
System.out.println("Names in alphabetical order");
for(String n:name)
```



```
ial |SoftPr
                                      SoftPro India, 100's
indial | Soft
                            dial
             System.out.println(n);
```

Stpro Him

ro Indial Develop a Java program to take ten numbers as input for an array AR. Now copy even numbers in array EAR and odd numbers in array OAR. Now display elements of EAR and OAR.

dial 150m

toro Ingia

Softpro

al Softs

ndial Sc

oIndial

Softpro

al Softs

```
.ast");
India | Softpro India |
India | Softpro India | Softpr
                                                                                                      import java.util.*;
                                                                                                        class Test
                                                                                              public static void main(String [] args)
                                                                                                                                                                                                                                                                     s"); mdia | Softpro India |
                                                                                               tpro India
```



```
ndial | Softpro Invia
        Josepho Indial 150mi
                          Softpro mu
                             SoftPro India, 100,
```

Softpro

al Softp

ndial 150

oIndial

```
...g [] args)

...ew int[10];
....t.f=0,item;
Scanner sc=new Scanner(System.in);
System.out.println("Enter ten numbers to the list");
for(i=0;i<10;i++)
{
!ist[i]=sc.nextInt();
ystem.out.print("Enter the numbers to the numbers to the list");
code for searching the numbers to the list");
code for searching the numbers to the list");
ro India 4
                                                                    fist[i]=sc.nextInt();
}
System.out.print("Enter the number to be search: ");
item=sc.nextInt();
//Code for searching
for(i=0;i<10;i++)
{
if(list[i]==item)
{
f=1;
break;
}
}
if(f==1)
{
System
stpro Indi
                                                                                                  System.out.println("The number "+item+" is found at location "+(i+1));
} else
{
System.out.println("The number is not form."
                                                                                                                                                                                       - Indian Softpro Indi
tpro India
SoftproIn
                                                                             Softpro Indial Softpro
Softpro India
```



Interview Questions: -

1. Can you pass a negative number as an array size?

Ans: - No, you can't pass a negative number as an array size because array size contains number of elements.

2. Can you change the size of the array once you define it or can you insert or delete the elements after creating an array?

Ans: - No, you can't change the size of the array once you define it. You can insert or delete the elements after creating an array.

3. What is the difference between int[] a and int a[]?

Ans: - There is no such difference in between these two types of array declaration. It's just what you prefer to use, both are integer type arrays.

4. "int a[] = new int[3]{1, 2, 3}" – is it a legal way of defining the arrays in java?

Ans: - This is invalid way to initialize an Array in Java. You cannot provide the size of the Array when you are declaring the elements in it.

5. What are jagged arrays in java? Give example.

Ans: - A jagged array is an array of arrays such that member arrays can be of different sizes, i.e., we can create a 2-D array but with a variable number of columns in each row.

6. How do you check the equality of two arrays in java? OR How do you compare the two arrays in java?

Ans: - The Arrays.equals() method can be used to check if two arrays are equal.

7. What is ArrayIndexOutOfBoundsException in Java? When it occurs?

Ans: - ArrayIndexOutOfBoundsException is a type of unchecked exception in java. It occurs when you use an array index of more than its size.

8. What value does array elements get, if they are not initialized?

Ans: - Everything in a Java program not explicitly set to something by the programmer, is initialized to a zero value.

For references (anything that holds an object), it is null. For int/short/byte/long, it is 0. For Booleans, it is false.

9. What are the drawbacks of the arrays in Java?

Ans: - Deleting or inserting — You cannot insert a new element at the middle of the array. In the same way you cannot delete elements from the middle of the array. You can only insert/delete from the end of the array.



Increasing size - You cannot increase the size of the arrays in Java, if you want to add new elements you need to create new array with extended size and assign to the array reference. This leaves the original object for garbage collection and thus wastage of memory occurs.

Storing Objects - You can store objects in an array but you cannot store objects of different types.

Processing Elements – Except some operations provided by the Array class, you cannot process the contents of an array.

Modifying elements - To delete or change the elements of an array you need to traverse throughout the array which increases the time complexity. Softpro India

Multiple Choice Questions:

COLUM	1110
50101	Which of these operators is used to allocate memory to array variable in Java? a) malloc b) alloc c) new d) new malloc Which of these is an incorrect array declaration? a) int arr[] = new int[5] b) int [] arr = new int[5] c) int arr[] = new int[5] d) int arr[] = int [5] new Which of these is necessary to specify at the time of array initialization? a) Row b) Column c) Both Row and Column d) None of the mentioned How to sort an array? a) Array.sort()
CHO!	a) malloc
al Softpr	b) alloc
150	c) new
_ \	d) new malloc
D., 6	() to ()
° 2.	Which of these is an incorrect array declaration?
110	a) int arr[] = new int[5]
132	b) int [] arr = new int[5]
VOT. (6	c) int arr[] = new int[5]
ndial 159	a) int arr[] = new int[5] b) int [] arr = new int[5] c) int arr[] = new int[5] d) int arr[] = int [5] new
1:2	CLD, True Step Mor. Co.
3.	Which of these is necessary to specify at the time of array initialization?
Tire	a) Row
tproindia 4.	c) new d) new malloc Which of these is an incorrect array declaration? a) int arr[] = new int[5] b) int [] arr = new int[5] c) int arr[] = new int[5] d) int arr[] = int [5] new Which of these is necessary to specify at the time of array initialization? a) Row b) Column c) Both Row and Column d) None of the mentioned How to sort an array? a) Array.sort() b) Arrays.sort() c) Collection.sort() d) System.sort() An array elements are always stored in memory locations. a) Sequential
910	c) Both Row and Column
1110	d) None of the mentioned
40	is the state of the
4.	How to sort an array?
10	a) Array.sort()
10 1	b) Arrays.sort()
CHOT	c) Collection.sort()
JEST.	d) System.sort()
Softpro In	1 1 20 1 2
5.	An array elements are always stored in memory locations.
Sty	a) Sequential
1 Softpa	b) int [] arr = new int[5] c) int arr[] = new int[5] d) int arr[] = int [5] new Which of these is necessary to specify at the time of array initialization? a) Row b) Column c) Both Row and Column d) None of the mentioned How to sort an array? a) Array.sort() b) Arrays.sort() c) Collection.sort() d) System.sort() An array elements are always stored in memory locations. a) Sequential b) Random
110	pro dia coftp, India Coftp
Z\ CX	0 10 60



	.0	4.473	11.4	
1. c	2. d	3. a	4. b	5. a

CYC	ore di	or,	45	201	100,	11
COLU	Puc	, 150	, O	1		oro
2/12	c) Sequential and F d) Binary search swer Key: -	adjal Sof	E46,	to Indial	Π	Z
Ja.	Fich L	00.	50*	D. Dr.	113	
1/2	c) Sequential and F	Random	cxO	(C)	12,	St. L
dia.	d) Binary search	engre.	COLLI	The	, 15	
Ans	swer Key: -	Random . d 3.	110	to ind	5. a	61
272	1. c 2	. d 3.	a	1. b	5. a	120,
100	190,	111	15	.0	1	
Ans Fil	l in the blanks: -	ection of similar data to used to obtain memoral method is used to solve the	112	a ascending order.	engin.	, 0
strpro Inc	1. is the coll	ection of similar data t	types.	50	O D	. 2/ /
10 L	Ans: - Array	11000	112	846	2	170
46,	2 kayword is	used to obtain memor	n of array	180,	Tire	,
.0	Ans: - New	used to obtain memor	y of affay.		CHOTO	210
CYPI	a dia'	25,6	1297	150	Ter.	Mo
20101	Ans: - Arrays.sort(method is used to s)	sort array elements ir	ascending order.	TOTO	
- CVC	170 11	2) 61	COL	dia	COLLE	10
. Gott	4. Two dimensional a	rray has two subscript: ns	s one for a	nother one for	()	00,
13	oto,	1:2	CLOLO	dia'	C 0827	2
a,	5pro	perty is used to find th	e length of array.	Thomas	1/50	4 C
15	7 ms Length		i not	0 11	21	666,
118	826,	gra	COLLA	100,	150	3,
UQ.	150,	O III.	1120	200	1:2	CX
1:2	CYPI	di?	y, 206	th.	great	(00),
TO die	100101	Tire	1150	*O }		10
011.	1/5	MIC	112	ELLS	910	. C
- 29.	10 CO	17. 12.	10.	30,	Tille	1/2
Tir	1/3	020	1:21	CXO1	A.	19,
*OTO	dia,	Step.	TOOL	COLUL	The	
Tor I	Tion 1	50	0 1	3/10	LOTO.	212
CHOTO	112	646,	2097	CO	ICK 1	Dor
COLLE	Trois	150	Oliv	1/20	070	4
7	(0)	1 61	(bro	dia,	CELLS.	110
ELL	1 is the coll Ans: - Array 2 keyword is Ans: - New 3 Arrays.sort() 4. Two dimensional and Ans: - rows, column 5 pronounced Ans: - Length	1903	The state of the	1	50	On
150	*O 1	. 2/10	CLOLO	212	846	<i>)</i>
1	XOr	710	Office	TOOL	(30)	
	3Ans: - Arrays.sort() 4. Two dimensional a Ans: - rows, colum 5 pro Ans: - Length	SoftPro India SoftPro India To India Comp	outer Techno	logies P Ltd	Page 53	3,50
112	ELDI	ro India Comp	COLLA	100,	160	Tox



dial

Java Lecture - 05

(String In Java)

Long Answer Questions: -

1. What is String in Java? How to take input from user for a string?

Ans: - String: - Technically string is a sequence of characters. In Java, string is a class in java.lang package. Object of String class is used to store string.

Taking input from user for string: -

Scanner sc=new Scanner(System.in);

System.out.print("Enter a string:");

String name=sc.nextLine();

What is the difference between String and StringBuffer class?

Ans: - Strings, which are widely used in Java programming, are a sequence of characters. In Java programming language, strings are treated as objects. The Java platform provides the String class to create and manipulate strings.

Whereas, StringBuffer class is a thread-safe, mutable sequence of characters.

- A string buffer is like a String, but can be modified.
- It contains some particular sequence of characters, but the length and content of the sequence can be changed through certain method calls. Softpro Indial
- They are safe for use by multiple threads. Softpro
- Every string buffer has a capacity.

Short Answer Questions: -

- What is the difference between
 - a. String str="softpro";
 - b. String str = new String("softpro")

Ans: - Both expressions give you a String object, but there is a subtle difference between them. When you create a String object using the new() operator, it always creates a new object in heap memory.

On the other hand, if you create an object using String literal syntax e.g. "softpro", it may return an existing object from String pool (a cache of String object in Perm gen space, which is now moved to heap space in recent Java release), if it already exists.

- What is the difference between equals() and == operator?
 - **Ans:** Difference between equals() and == operator:
 - operator is that one is a The main difference between the .equals() method and = method and the other is the operator.

ro Indial | Soft



We can use == operators for reference comparison (address comparison) and equals() method for content comparison. In simple words, == checks if both objects point to the same memory location whereas equals() evaluates to the comparison of values in the objects.

ELDLO IIINI

to India

What is the difference between length vs length()?

Ans: -

roIndia

·O ·	length	length()
7.	length is an attribute i.e. a data member of	length() is a member method of String class.
100	array.	, \>
0 1	It gives the length of an array i.e. the number of	It gives the number of characters present in a
250	elements stored in an array.	string.
47	office Color	10, 120,
4	. What is the difference between equals() and equals	alsIgnoreCase()?
.0	Ange aquals() in Java is used to shock for equal	

Ans: - equals() in Java is used to check for equality between two strings. equalsIgnoreCase() in Java to check for equality between two strings ignoring the case.

5. What is purpose of trim() method?

Ans: - The trim() method in Java String is a built-in function that eliminates leading and trailing Softpro

Technical Tasks: -

1. Develop a Java program to take username as input and display name in upper case and lower case.

```
Etpro India | Soft
                                     ial | SoftPro Indi
import java.util.*;
class Test
public static void main(String [] args)
                                                      SoftproIndial
String name;
Scanner sc=new Scanner(System.in);
System.out.print("Enter your name : ");
name=sc.nextLine();
System.out.println("Name in upper case="+name.toUpperCase());
System.out.println("Name in lower case="+name.toLowerCase());
                                           Indial
     Indial
```



2. Develop a Java program to compare two strings for equality.

dial 150m

pro maia

ial |SortPr

indial

roIndia

Softpro

al Softe

oIndial

Softpro

al Softp

```
. sc=new Scanner(System.in);

.system.out.print("Enter first string: ");
str1=sc.nextLine();
System.out.print("Enter second string: ");
str2=sc.nextLine();
if(str1.equals(str2))

(system.out.println("Both strings))

(see Second String in the string in th
....("Both strings are equal");

(System.out.println("Both strings are not equal");

(System.out.println("Both strings are not equal");

(System.out.println("Both strings are not equal");
```

Etpro IIIu.

3. Develop a Java program to count number of words in a sentence.

```
Java.util.*;
ctass Test
{
public static void main(String [] args)
{
String sen;
Scanner sc=new Scanner(System '
ystem.out.print("Enter ')
'n=sc.nextLine()'
'ting [] wor'
stem '
stem '
ystem.out.print("Enter ')
'ting [] wor'
stem '
stem '
'ting [] wor'
'ting [] wor'
stem '
stem '
'ting [] wor'
Scanner(System.in);
Sut.print("Enter a sentence: ");
Sn=sc.nextLine();
String [] words=sen.split(" ");
System.out.println("Number of words="+words.length);
}
                                                                                                                                                       ial Softpro India
                                                                                                                                                                                                    Athro Ind
```

COL



ndial | SoftPro 4. Develop a Java program to take a sentence as input, in sentence replace a word with another

HPP O MINI

dial 150m

roIndia

oIndial

Softpro

al Softs

```
Indial | Softpro Indial
                                       dial Softpro India
import java.util.*;
class Test
                                                  SoftproIndial
public static void main(String [] args)
String sen,fw,rw;
Scanner sc=new Scanner(System.in);
System.out.print("Enter a sentence : ");
                                                        SoftproIndia
sen=sc.nextLine();
System.out.print("Find what? ");
fw=sc.nextLine();
System.out.print("Replace with : ");
rw=sc.nextLine();
System.out.println("Modified sentence="+sen.replace(fw,rw));
```

5. Develop a Java program to check given string is palindrome or not.

```
Softpro India | Softpro India 
                                                                                                                                                                                                                              Pro India | SoftPro India | PostPro India | Pro India 
import java.util.*;
class Test
                                                                                                                                                                                                                                                                                                                       India | Softpro India | Soft
 public static void main(String [] args)
 String str,revstr="";
 int i;
                                                                                                                                                                                                                                                                                                                                                                      Indial | Softpro Indial | S
 Scanner sc=new Scanner(System.in);
System.out.print("Enter a string:");
 str=sc.nextLine();
 for(i=str.length()-1;i>=0;i--)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Softpro India
revstr=revstr+str.charAt(i);
 if(str.equalsIgnoreCase(revstr))
 System.out.println("String is palindrome");
else
 System.out.println("String is not palindrome");
```



Develop a Java program to take username as input and display its short name. E.g. user has entered Ajay Pratap Singh then output should be A.P.Singh.

```
Indial |Softpro Inc
                                   ndial 150
import java.util.*;
                                           Indial Softpro India
class Test
public static void main(String [] args)
String name;
                                                Indial |Softpro Ind
int i;
Scanner sc=new Scanner(System.in);
System.out.print("Enter your full name : ");
name=sc.nextLine();
String [] shortname=name.split(" ");
System.out.print("Your shortname is : ");
for(i=0;i<shortname.length-1;i++)
System.out.print(shortname[i].charAt(0)+".");
System.out.print(shortname[shortname.length-1]);
                                                   tpro Indial 1501
```

Interview Questions: -

- 1. equals() method is present in which class? **Ans:** - equals() method is present in String class.
- What is the purpose of equals() method in String class? **Ans:** - equals() method is used to compare two strings for equality.
- 3. String & StringBuffer & StringBuilder & StringTokenizer are present in which package name? Ans: -String & StringBuffer & StringBuilder & StringTokenizer are present in java.lang package.
- 4. What is the purpose of String class equals() & StringBuffer class equals()? Ans: - equals() method has been overridden in String class to check and match the content of two different Strings. The simple answer is that StringBuffer (and StringBuilder) do not override the base semantics of Object. equals() so equals on a StringBuffer will simply compare object references.



What is the difference between concat() method & append()?

Ans: -

- 1. Concat is used to add a String at the end of another String. Append adds a String or character sequence to StringBufffer.
- 2. Concat creates a new String object whereas StringBuffer append doesn't.
- 3. Append is more efficient than concat.
- 6. What is the difference between compareTo() vs equals()?

compareTo	equals
It compares two strings lexicographically.	It checks if contents of two strings are same or not.
The result is a negative, positive or zero integer value depending on whether the String object precedes, follows or is equal to the String argument.	otherwise it is false.

7. What is the purpose of contains() method?

Ans: - contains() method searches the sequence of characters in the given string. It returns true if sequence of char values are found in this string otherwise returns false.

String is a final class or not?

Ans: - A String is a final class & its immutable because it can't be changed but can be referred to Indial Softpro another object.

Multiple Choice Questions:

- 1. Which of these classes is superclass of String and StringBuffer class?
 - a) java.util
 - b) java.lang
 - c) ArrayList
 - d) None of the mentioned
- pro Indial 150ft Which of this method of class String is used to obtain a length of String object?
 - a) get()
 - b) Sizeof()
 - c) lengthof()
 - d) length()
- Which of these methods of class String is used to extract a single character from a String object?
 - a) CHARAT()
 - b) chatat()
 - c) charAt()
 - d) ChatAt()



CYO	Tia, ofth war con con
COLLI	100 120 10 1 1 1 10 10 10 10 10 10 10 10 10 10
1/2	sproindia Springia Springia Springia
ndial Soft Pa	Which of these methods of class String is used to compare two String objects for their equality? a) equals() b) Equals() c) isequal() d) Isequal() Which of these data type value is returned by equals() method of String class? a) char b) int c) boolean d) all of the mentioned
1 54.	Which of these methods of class String is used to compare two String objects for their equality?
112	a) equals()
2010	b) Equals()
11.	c) isequal()
112	Which of these methods of class String is used to compare two String objects for their equality? a) equals() b) Equals() c) isequal() d) Isequal() Which of these data type value is returned by equals() method of String class? a) char b) int c) boolean d) all of the mentioned Which of these methods of class String is used to remove leading and trailing whitespaces?
ro Indial	Which of these data type value is returned by equals() method of String class?
CO III	a) char
19	b) int
100	c) boolean
40	d) all of the mentioned
stpro India	Which of these data type value is returned by equals() method of String class? a) char b) int c) boolean d) all of the mentioned Which of these methods of class String is used to remove leading and trailing whitespaces? a) startsWith() b) trim() c) Trim() d) doTrim()
6.	Which of these methods of class String is used to remove leading and trailing whitespaces?
070	a) starts with() b) trim()
ELG.	c) Trim()
30,	d) doTrim()
	is rial cross dia coffee in
ELL.	Which of this method of class String is used to extract a substring from a String object?
150	a) substring()
1 1	b) Substring()
al SoftP	d) None of the mentioned
12	Which of these methods of class String is used to remove leading and trailing whitespaces? a) startsWith() b) trim() c) Trim() d) doTrim() Which of this method of class String is used to extract a substring from a String object? a) substring() b) Substring() c) SubString() d) None of the mentioned
Answ	Which of this method of class String is used to extract a substring from a String object? a) substring() b) Substring() c) SubString() d) None of the mentioned Ter Key: -
ygre I	b 2. d 3. c 4. a
	c 6. b 7. a
112	the gire court work that
Fill i	n the blanks Questions: -
1 111 1	String class is available in package
2718	buing class is available in package.
Thou	Ans: - java.lang
40 3	mothed of Chrise class is used to find levels of string
*O1 2.	method of String class is used to find length of string. Ans: - length()
101	This length()
3.	is return type of equals() method.
EF.6 ,	Ans: - boolean
CO1.	- In 1/2 10 - 1/1 10 10
4.	method of String class is used to remove white spaces of starting and ending of
ELL	string. Ans: - trim()
150	ZHIS CHINA
1 1-	Die Tig, Ett, Edge Colle
), C	
	Softpro India Computer Technologies P Ltd Page 60

CYD



Softpro Indial 10011

Storo mer

ndial | Softpro Inuia Long Answer Questions: -

1. What is method in Java? What is the importance of method in Java?

Ans: - Method is a named block of code which performs specific task.

Importance of method: - If you have a block program, then you can create a method you can avoid. Jial Softpro India

```
<Method Modifiers> <Method Return Type> <Method_Name>(Parameters) {
      //code
```

How many types of methods are there in java?

Ans: - In Java programming language, there are two types of methods: -

Static Method: - static methods are created by using static modifier. There is no need of object to call static methods.

Non-static Method: - non-static methods are not created by using static modifier. These methods are call by creation of object.

3. What is the difference between static and non-static methods in Java?

Ans: - A static method is a method that belongs to a class but it does not belong to an instance of that class and this method can be called without the instance or object of that class. Every method in java defaults to a non-static method without static keyword preceding it. Non-static methods ro Indial | Softpro Ir ariable, Softpro India an in 190 India 119 SoftPro Inc can access any static method and static variable, without creating an instance of the object. adia | Softpro India



Short Answer Questions: -

to Mara

1. How to create a method in java, write its syntax?

roIndia

```
Creation of method: -

<Method Modifiers> <Method Return Type> <Method_Name>(Parameters)

{

//code
}

Vhat is access modifier?

ns: - Access modifiers are keywords in Java ''
odifier restricts the access of a a'
va language has f
stpro India
```

dial 150m

Java language has four access modifiers to control access level for classes and its members.

Athro Mini

Why the main() method is static in Java?

Softpro In Ans: - The main() method is static so that JVM can invoke it without instantiating the class. This also saves the unnecessary wastage of memory which would have been used by the object declared only for calling the main() method by the JVM.

Void: It is a keyword and used to specify that a method doesn't return anything.

4. How to call a non-static method from main in Java?

Ans: - Non-static method is called by creating the object of class from main in java.

What is Recursion? Explain with an example.

Softpro Indial Softpro Indial Soft a. Let. Ans: - Recursion: - When a method calls itself, then it is called Recursion. Let's consider an

```
Softpro India | Softpro India | Softpro India |
```



Technical Tasks: -

al

SOFTP

to India

1. Develop a Java program to make a temperature convertor by creating user defined methods. In this program create two methods ctof() and ftoc().

ndial 150m

In ctof() method convert temperature from Centigrade to Fahrenheit and in ftoc() method convert temperature from Fahrenheit to Centigrade.

Stbro III

```
Softpro Indial Softpro India
                       Stpro Indial Softp
return c;
}
public static void main(String [] args)
{
double c.f;
nt ch;
'canner sc=new Scanner'
est t=new Test()-
'stem.out r
ster'
                                Jial Softpro Indial Softpro In
                                    dial Softpro Indial Softpro
                                     Indial | Softpro India
 System.out.println("Enter 1 for c to f");
 System.out.println("Enter 2 for f to c");
 ch=sc.nextInt();
                                           Indial | Softpro Indial | S
 switch(ch)
 case 1:
 System.out.print("Enter temperature in c : ");
 c=sc.nextDouble();
                                                           SoftproIndia
 f=t.ctof(c);
 System.out.println("Temperature in f="+f):
 break;
 case 2:
 System.out.print("Enter temperature in f : ");
 f=sc.nextDouble();
 c=t.ftoc(f);
 System.out.println("Temperature in c="+c);
```



```
ndial | Softpro
                                  Softpro India 1 Jour
                                                    ndial Softpr
                                          Etpro India
           System.out.println("Invalid choice");
```

ro Indial

Jial 150m

```
Softpro India | Softpro India |
. u*fact(n-1);

}
public static void main(String [] args)
{
int n,f;
3canner sc=new Scanner(Svs*
est t=new Test();
vstem.out.prinf/"*
sc.next!r*
f*
anner sc=new Scanner(System.in);

Test t=new Test();
System.out.print("Enter a number to find factorial: ");
n=sc.nextInt();
f=t.fact(n);
System.out.println("Factorial="+f);

evelop a Java proc
```

3. Develop a Java program to find area and perimeter of rectangle using user-defined static methods.

```
Softpro India
                              tpro India
                                           Indial | Soft
import java.util.*;
class Test
public static int area(int l,int b)
return (1*b);
public static int perimeter(int l,int b)
```



```
{
return 2*(l+b);
}
public static void main(String [] args)
{
int l,b,a,p;
Scanner sc=new Scanner(System.in);
System.out.println("Enter length and breadth of rectangle");
l=sc.nextInt();
b=sc.nextInt();
a=area(l,b);
p=perimeter(l,b);
System.out.println("Area of rectangle="+a);
System.out.println("Perimeter of rectangle="+p);
}
```

Interview Questions: -

1. What is method in Java?

Method: - Method is a named block of code which perform specific task. If you have a block of code which is required in different locations of program, then you can create a method of that code and call it from desired locations. By using method, you can avoid to write same code over and over.

2. How many types of methods are there in java?

Ans: - In Java Programming language, there are two types of methods: Static method and Non-static method.

3. What do you mean by method signature?

Ans: - In Java, a method signature is part of the method declaration. It's the combination of the method name and the parameter list.

4. Can you overload main() method?

Ans: - Yes, we can overload the main method in java but JVM only calls the original main method, it will never call our overloaded main method.

5. What is static method?

Ans: - Static Method is declared by using static keyword. There is no need of object to call static method.

6. What is non-static method?

Ans: - Non-static method is not declared by using static keyword. Non-static methods are also called instant methods. Non-static methods can be called by using object only.



848

cross	110,	EFF	omanial	, GO:	11
COLLE	100	30	Jr.	15	0
1150	to India,	(40)	io dia	<u>&P?</u>	
13/ 646	110	COLLE	100		(
(2010)	Tric	120	any value?	2/1	10x
<u>Multiple</u>	Choice Questions: -	21	46, 9	ia co	CI
1 W	nat is the return type of a metho	od that does not return	any value?	1/20	
a) i		od that does not retain	any value?	122	67
	float	112,	ELL.	2011	00)
c) v	void	Jan	30,	1	
	double	, ,	TO TO	Cindial	
2. Wh	nich method can be defined only	ly once in a program?	ELL	1201	, 0
	main method	100	190	O III.	1 1
	finalize method	Or	1 1	2,13	7
AC 0	static method	11	y, ELL	1001	
L T L L	private method nich of these is the method whi	ch is avacuted first be	fore execution of any other	thing takes	
	ce in a program?	ch is executed first be	fore execution of any other	thing takes	2:10
	nain method	*O1	110	424	Orx
	finalize method	11	idial 150	01	
c) s	static method	40 h		1001	
d) ₁	private method	CKOT	410	COLLE	110
	nat is the process of defining m	ore than one method i	n a class differentiated by n	nethod	1/1
1	nature?	20	0,	nethod	
	Function overriding	CKO	210	Cotto	
	Function overloading Function doubling	GOTTE	100	150	
	None of the mentioned	1/20	*0 1	2 / 2	01
5. Whi	ch of the following is a method	d having same name a	s that of it's class?	1 150th	12
a) fi	nalize	. co)	ri Tuo	, 150	
c) c	elete lass	1/2	40		10
	onstructor	dia	CKD	dia c	OF
112	FKF	2012	-O101 14	10	2
Answer Ko	y:-	1/	40 ,		
1. c	2. a	3. c	4. b	5. d	. C
710	COLLE	170	, GO1	Tille	1-
Fill in th	e blanks Questions: -	0 1	70	o India	
10	2/ (40)	41	y, Eth.	2 die	
1 21	keyword is used to s: - static	create a static method	100,	17	
Total Wall	s static	40 3		200	120
	nen a method calls itself, it is c	alled	410	TY CO	Orza
An	s: - Recursion	11	10,	JI.	dia
3. Sta	tic method is also called	method.		110	4
	s: - class	CLOX	dial	ELL	500
4 No	n-static methods are also called	d me	thods.	20'	Tr.
	s: - Instance	1110	uious.	· · · · ·	
1 10	112	C4.67	710	CALLA	
7, 000	- Aliv	CO1,	100	100	
	Softpro India	Computer Ted	chnologies P Ltd	Page 66	320



Indial |Se

Java Lecture - 7

(Object Oriented Programming)

Long Answer Questions: -

- 1. What is Object Oriented Programming System? Describe its pillars.
 - **Ans: OOPS** stands for Object Oriented Programming System, it is a mechanism of software development. The OOPS has following pillars: -
 - **i.) Abstraction: -** Abstraction is a mechanism to show essential functionalities and hide all other functionalities of an object.
 - **Encapsulation:** Encapsulation is a mechanism to wrap properties and functionalities in a single unit which is called object.
 - iii.) Inheritance: In Inheritance, you can create a new product by using existing product.
 - iv.) **Polymorphism:** The term polymorphism means one thing many forms.
- 2. What is Class and Object?

Ans: -

Class: - Class is the collection of variables and methods. Class is also called as blue print of object. We always create the object of a class.

Object: - Object is an entity which has its states and behaviors.

3. What is constructor? Write its importance.

Constructor: - Constructor is a special method which is used to initialize final variables. The Constructor has following properties: -

- **i.)** Constructor name is same as class name.
- **ii.**) Constructor has no return type.
- iii.) Constructor is called automatically as soon as an object is created.

Short Answer Questions: -

1. What is abstraction?

Ans: - Abstraction is a mechanism to show essential functionalities and hide all other functionalities of an object.

2. What is encapsulation?

Ans: - Encapsulation is a mechanism to wrap properties and functionalities in a single unit. That single unit is called object.

3. What is inheritance?

Ans: - In Inheritance, you can create a new product by using existing product.



What is polymorphism?

to India

- Ans: The term polymorphism means one thing many forms.
- 5. What is class?
 - Ans: Class is the collection of variables and methods; class is also called as blueprint of object. We always create the object of a class.

Etpro mini

- What is an object?
 - Ans: Object: Object is a real world entity, which has its states and behavior.
- What is constructor?
 - Ans: Constructor is a special method which is used to initialize final variables. The constructor has following properties: ro Indial Softpro
 - i.) Constructor name is same as class name.
 - ii.) Constructor has no return type.
 - iii.) Constructor is called automatically as soon as an object is created.
- 8. How many types of constructors are there?
 - **Ans:** In Java there are two types of constructor: -
 - **Default Constructor**
 - Parameterized Constructor

Technical Tasks: -

Idial |Softpro India Create a class named TestClass with a method sayHello(). In sayHello() method display "Hello World" message. Now call sayHello() method by creating anonymous object.

```
India | SoftPro India
                            Indial | Softpro India
System.out.println("Hello World");
}
class Test
                                        1 Softpro Indial
public static void main(String [] args)
new MyClass().sayHello();
```



Create a class named Employee. In Employee class, take three private data members empid, empname and salary. Now create a public method setEmployee() to initialize private data members. And also create a method getEmployee() to display employee's details. Now test the roIndia class employee.

Etpro Min.

to India

Soft

```
sal)
                           Indial
                                         Indial SoftPro Indial
import java.util.*;
class Employee
 private int empid;
private String empname;
                               Softpro Indial Softpro India
private double salary;
public void setEmployee(int eid,String ename,double sal)
empid=eid;
empname=ename;
Employee emp=new Employee();
emp.setEmployee(1001,"Brijesh Mishra",40000.0);
emp.getEmployee();
}

evelop a class
ameter
salary=sal;
```

3. Develop a class named Rectangle with final data members length and width. Make a parameterized Constructor to initialize data members. Now make two methods rectarea() and rectperi() to calculate area and perimeter. Test the class Rectangle.

```
import java.util.*;
class Rectangle
final int l,b;
Rectangle(int x,int y)
```



```
ndial | Softpro Inuia
                                    Larea()

Leaurn (I*b);

public int rectPeri()

{
teturn 2*(l+b);

}
                                    class Test
{
    public static void main(String [] args)
    {
        int x,y;
        icanner sc=new Scanner(Svs*
        ystem.out.println("Enr*
        sc.nextInt();
        sc.nextIn*
        itar

                                    static void main(String [] args)

int x,y;
Scanner sc=new Scanner(System.in);
System.out.println("Enter length and bread*'
x=sc.nextInt();
/=sc.nextInt();
lectangle r=new Recta*
t a=r.rectArea()*
! p=r.rec**
st*
                                     ...aun(String [] args)

...au x,y;

Scanner sc=new Scanner(System.in);

System.out.println("Enter length and breadth of rectangle");

x=sc.nextInt();

y=sc.nextInt();

Rectangle r=new Rectangle(x,y);

nt a=r.rectArea();

nt p=r.rectPeri();

ystem.out.println("'')

stem.out
stpro Indi
                                    Jeadth of rectangle");

Jean Rectangle(x,y);

Jean Rectangle(x,y);

Jean P=r.rectPeri();

System.out.println("Area of rectangle="+a);

System.out.println("Perimeter of rectangle="+p);

}

Develop a class named Interest trameterized Construct lculate simple:
```

ro Indial

Softpro

al Soft

ndial

oIndial

Softpro

il Soft

4. Develop a class named Interest with private data members' p, n & r of double type. Make a

```
Indial | Softpro Indial | S
tpro India
                                   SoftproIndial | Softpro
               private double p,n,r;
Interest(double p,double n,double r)
{
this.p=p;
his.n=n;
his.r
                                                                     Softpro India
                                                                                    oro Ind
                this.r=r;
```



```
__inain(String [] args)

__ouble p,n,r;

Scanner sc=new Scanner(System.in);

System.out.print("Enter principle amount : ");

p=sc.nextDouble();

System.out.print("Enter time in years : ");

1=sc.nextDouble();

System.out.print("Enter rate · "*

=sc.nextDouble();

terest I=new **

uble - ...
                                                                                                                                                                                                                                                                                                                                                                                                     ro Indial | Softpro Indial | Softpro India
                                                                                                                                                                                                                                                                                                                 Softpro Indial | Softpr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Etpro Indial Softpro India
                                                                                                                                                                                                                                                                                                                                                                     dial Softpro Indial Softpro Indial Softpro Indial Softpro Indial Softpro India India
           double si=I.simpleInterest();
           System.out.println("Simple Interest="+si);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Softpro Indial Softpro dv
```

Etpro IIIvi

Interview Questions: -

1. What are the main building blocks of OOPS?

Ans: - Building blocks of OOPS are given below: -

- Abstraction i.)
- Encapsulation ii.)

pro India.

Jia 15011

- iii.) Inheritance
- iv.) **Polymorphism**
- 2. When do we create anonymous object? What is the advantage of anonymous object creation?

Jial | Softpro India Ans: - When you require an object only one time then you can create anonymous object. The main advantage of anonymous object is that it automatically gets destroyed after its India 115

3. What is the root class for all java classes?

Ans: - Object is the root class for all java classes.



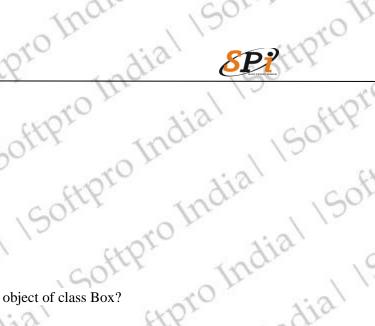
- What is constructor in java? Why do we use constructor.
 - Ans: Constructor is a special method which is used to initialize final data members. The Pro Indial | Sof properties of constructor are given below: -
 - Constructor name is same as class name.
 - Constructor has no return type.
 - Constructor is called automatically as soon as an object is created. iii.)
- How many types of constructor are there in Java?

Ans: - In Java, constructor is of two types: -

- Default constructor
- Parameterized constructor
- What do you mean by constructor overloading?
 - Ans: If you create many constructors in a single class with different parameters then it is called constructor overloading.
- 7. What do you mean by abstraction?
 - Ans: Abstraction is a mechanism to show only essential functionalities and hide all other functionalities of an object.
- 8. What is the difference between normal method and abstract method?
- Softpro Indial Softpro Ans: - Abstract method contains only method declaration and no definition whereas normal method contains method definition.

Multiple Choice Questions: -

- 1. Which of the following is not an OOPS concept in Java?
 - a) Inheritance
 - b) Encapsulation
 - c) Polymorphism
 - d) Compilation
- EtPro Indial 2. Which concept of Java is a way of converting real world objects in terms of class?
 - a) Polymorphism
 - b) Encapsulation
 - c) Abstraction
 - d) Inheritance
- Which concept of Java is achieved by combining methods and attribute into a class?
 - a) Encapsulation
 - b) Inheritance



c) Polymorphism

pro mou

- d) Abstraction
- indial 150 Which of these keywords is used to make a class?
 - a) class
 - b) struct
 - c) int

roIndia

- d) None of the mentioned
- Softpro Indial Soft adial Softpro Indial Which of the following is a valid declaration of an object of class Box?

Jia 150111

Softpro Mini

- a) Box obj = new Box();
- b) Box obj = new Box;
- c) obj = new Box();
- d) new Box obj;
- atype? 6. Which of these operators is used to allocate memory for an object? ial Softpro Indial Softpro In
 - a) malloc
 - b) alloc
 - c) new
 - d) give
- oftpro Indial | Softpro 7. What would be the behavior if the constructor has a return type?
 - a) Compilation error
 - b) Runtime error
 - c) Compilation and runs successfully
 - d) Only String return type is allowed
- What is true about constructor?
 - a) It can contain return type
 - b) It can take any number of parameters
- ial Softpro Indial Soft
- a) import
 b) catch

1 150



112	STA - CO. 11
CO COLOR	100, 120
(20, 11,	10
c) abstract d) this Answer Key: -	
la, the	CO), 120 1 20 "
130, 111	1000
c) abstract	CKO, Tro
d) this	COLUL INC
non com the	190
c) abstract d) this Answer Key: -	6 C 7 A 8 B 9 C 10 D
1 D 2 C 3 A 4 A 5 A	6 C
2 C	7 A
3 A	8 B
4 A	9 C
5 A	10 D
100	112
10	112
CLO, YIO TILL	(20) (20) JII
Fill in the blanks: -	2/11
10	o risi exp. Tin
The state of the	die Corri Ilia
antity and GO'	171 17 17
1. Hiding all functionalities and showing es	ssential functionalities is called
3 A 4 A 5 A Fill in the blanks: - 1. Hiding all functionalities and showing est Ans: - Abstraction	9 C 10 D
() ()	

12	Answer Ixey	-40			CKO)	710	201
1	1	CKD,	D A	600	Los	C	150
110	2	201,	C	7	-	A	
roInd	3)	A	8	(40)	B A	110
to	5	173	A	10	COLU	D (1)	10
4	na	100,	11	10	13	40	'
0	7	112	070	1:2	CA	(D)	910
HOT	21	gr,	ELG.	- 2 gra	. 601		120
Lok	Fill in the	blanks: -	C A A A A es and showing essentint of	Tire	1/3	-40	
	40°		T. Comment	11	2	846,	910
CXC) }	410	ELL	300		20,5	Tire
CO10)	1. Hidin	g all functionalitie	es and showing esse	ential functionalitie	s is called	J	070
13	Ans:	- Abstraction		201	112	-66	2
	64 Q CI	910	000	1	Or	100,	Tri
, 60	2. Class	1s known as bluep - Object	orint of	- '0'	,	10	250
110	7 213	Object	2/	Crot	7,19		ELL
5,	3. Objec	t is container of _	70	and	100	15	indial soften
	Ans:	- Properties and Fi	inctionalities.	, ·	0 1		100
	4	is us	ed to construct the	object.		710	COLLE
719,	Ans:	- Constructor	WO'T	. CO111	10		150
Jor	5 Creat	ion of new produc	t by using evicting	product is called	10		CX
	Ans:	- Inheritance	t by using existing	product is carica _	46,	970	COL
21	ia.	TELL	1000	, 60	1 1	Tre	1/20
100	. /	50	CO II	110	200)	12
0	2	CXC	17	719.	ELL	- ~0	C
	-910	COLU	10	10	30,	JI.	1/-
- 1	TIO	120	40 2			250	112
200	112	1	CLD,	910	5067	7	Dar
th.	2 die	, 90	Drox	Tire	1150	.0	17
	JI.	1/2	240	0	2/1	CVOI	210
	to	112	ELD.	297	0	Tick	100
ELL	40	Or	30,	Tire	1/2	,	40
50	0 11	\	10	200	120	CYC	3
	MOTON	110,	- 261	.Y	Ore	. CO10)	12,
00	Lok	100	150	0 /	,	12	40
150	AC () 1	1 10	CLOTO	210	,	EKB,
//	CKOT	1	10.	FILE	TOO	, 60), ,
	4 (1)	Softpro	Indi <u>a Com</u> p	uter <u>Techno</u>	olog <u>ies</u> P_L	t d Page 74	offpro Indial soft pro India soft pro Indi
	\~~	70	150	CX*V		170	177
122	64	P	470	COINT	10		50



Java Lecture - 08

HPro Mins

(Inheritance in Java)

indial | Softpro Illuia Softpro Indial 130111

Softprofr

ndial Sof

Softpro

1. What is Inheritance in Java? What is its importance?

Long Answer Questions:
1. What is Inherita.

Are we can

Derived class

Lof Inheritance:
class A

//Variables and methods

class B extends A

//Variables and r
//Variables and r-**Ans: - Inheritance: -** Inheritance is a feature of object oriented programming. In Inheritance, you



al Softpre

```
How many types of Inheritance are there in Java?

Ans: - Java programming language supports three types of inheritance: -

i.) Single Inheritance
ii.) Hierarchical Inheritance
ii.) Multi-level Inheritance
```

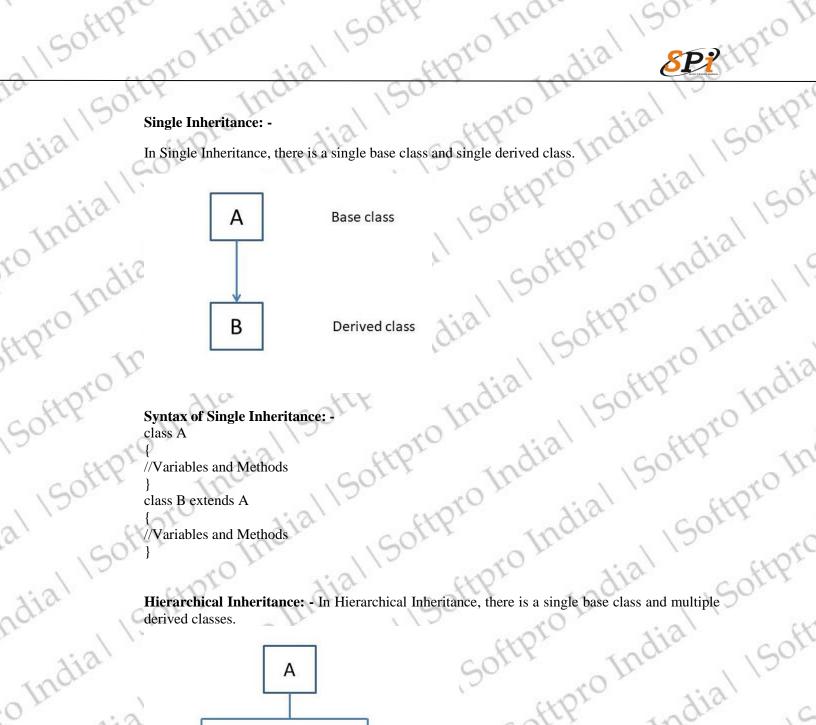
oIndial tpro India 2. How many types of Inheritance are there in Java?

Softpro Indial Softpro

- 1 Softpro Ind

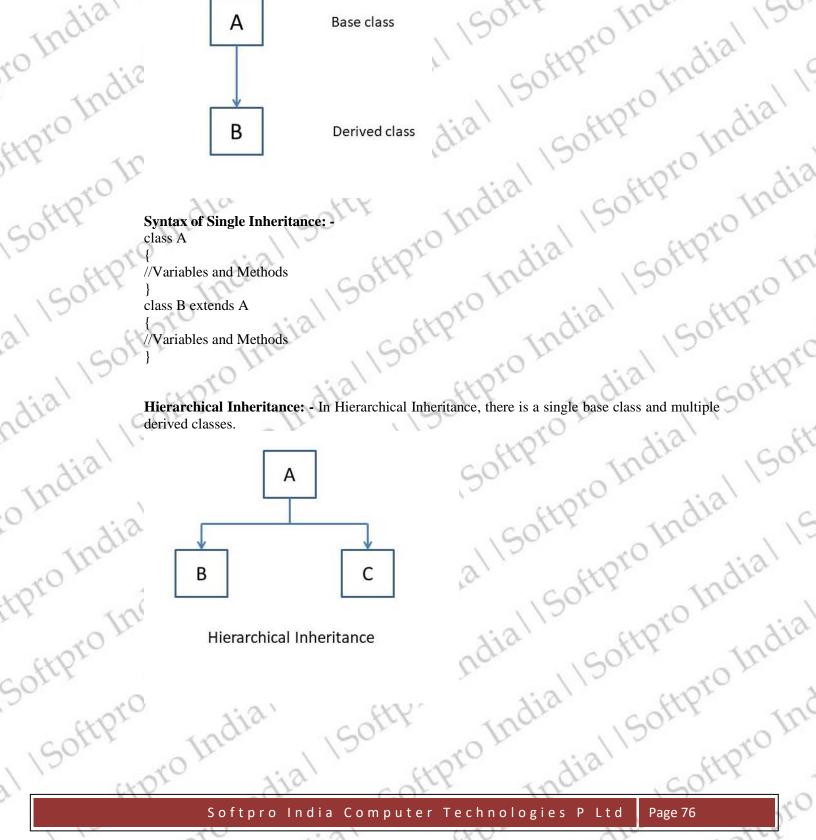
COL





I Softpro

Cro





Strpro Indial Softpro Indial S

Softpro India

```
Lethods

List B extends A

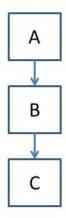
{
//Variables and Methods
}

class C extends A

{
//variables and Methods
}
                    Soft Promiting 1
          Multi-level Inheritance:
extends A

//variables and Methods
}
```

al Softpre



```
Multi-level Inheritance

Syntax of Multi-level Inheritance: -

class A
{
//Variables and Methods
}
class B extends A
{
//Variables and
                                                                                                                                   Lace: -

Les and Methods

class B extends A

{
//Variables and Methods
}

class C extends B

Variables and Method
                                                                                                                                                                                                                                                          ..ods Softpro India | Softpro 
ariables and M
}
class C extends B
{
//Variables
}
```



Short Answer Questions: -

1. Write syntax to implement inheritance.

co Indial SoftPro Indial Ans: - Syntax to implement inheritance is given below: -

```
class A
//Variables and Methods
class B extends A
//Variables and Methods
```

Why multiple inheritance is not supported in java?

Softpro Indial Soft Ans: - The reason behind this is to prevent ambiguity. Consider a case where class B extends class A and Class C and both class A and C have the same method display(). Now java compiler cannot decide, which display method it should inherit. To prevent such situation, multiple inheritances is not allowed in java.

What is Reusability?

Ans: - Reusability: As the name specifies, reusability is a mechanism which facilitates you to ro Indial |SoftPro reuse the fields and methods of the existing class when you create a new class. You can use the tpro Indial same fields and methods already defined in the previous class.

Write importance of inheritance.

Ans: - Inheritance is used to achieve 'Reusability

Which keyword is used to implement inheritance?

Ans: - extends keyword is used to implement inheritance.

Technical Tasks: -

Develop a program in java to create a class Rundog. In Rundog class, make a method bark(), in bark() method display the rundog name and voice. By extending Rundog class create a new class named Bulldog. In Bulldog class, make a method grawl(), in grawl() method display bulldog name and voice.

```
SoftPro India
                                         Indial | Soft
class Rundog
public void bark()
System.out.println("Sheru....");
System.out.println("Bho......bho.....");
```



```
ndial | Softpro Inuia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SoftProIndial
                                                                                                                                                                                                                                                                                                                                                                   Softpro India | Softpro India 
                                                                                                                                                                                   class Bulldog extends Rundog
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ro Indial | Softpro Indial | Soft
                                                                                                                                                                                      System.out.println("Tommy.....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indial | Softpro Indial
                                                                                                                                                                                      System.out.println("Gurr.....gurr.....
                                                                                                                                                                                      class InDemo1
                                                                                                                                                                                      public static void main(String [] args)
                                                                                                                                                                                      Bulldog dog=new Bulldog();
                                                                                                                                                                                      dog.bark();
                                                                                                                                                                                      dog.growl();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              oftpro In
```

dial 150ich

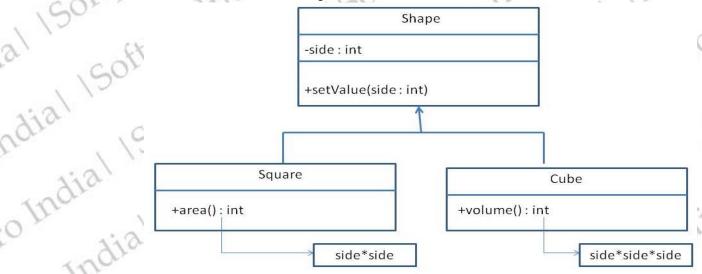
Create the classes as following structure: -

ro Indial

al Soft

Softpro

al Softp



Now Test the classes.

```
Pro Indial | SoftPro In
tpro India
                                                                                                                                                                                                                                                                                                                                                                                                                                     SoftPro India 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             dia | Softpro India
                                                                                                                                                                                              import java.util.*;
                                                                                                                                                                                              class Shape
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Goftpro Ind
                                                                                                                                                                                             int side; //Instance Variable
                                                                                                                                                                                               void setValue(int s)
```

1001



```
ndial | Softpro Inuia
                                                                                                                                  class Square extends Shape
{
int area()
eturn (sir<sup>1</sup>
                                                                                                                                                                                                                                                            Pro Indial SoftPro India, 100,
                                                                                                                                                                                                                                                                Softpro India | Softpro India 
                                                                                                                                 class InDemo2
{
public static void main(String [] args)
{
int s,a,v;
icanner sc=new Scanner(Sve-
quare sq=new Square-
istem.out.print/"
sc.nextIn-
isc.nextIn-
iph*
stpro India
                                                                                                                                 al Softpr
                                                                                             +v):
Softpro India
Softpro Ind
ndial 150f
tpro India
- olume
```

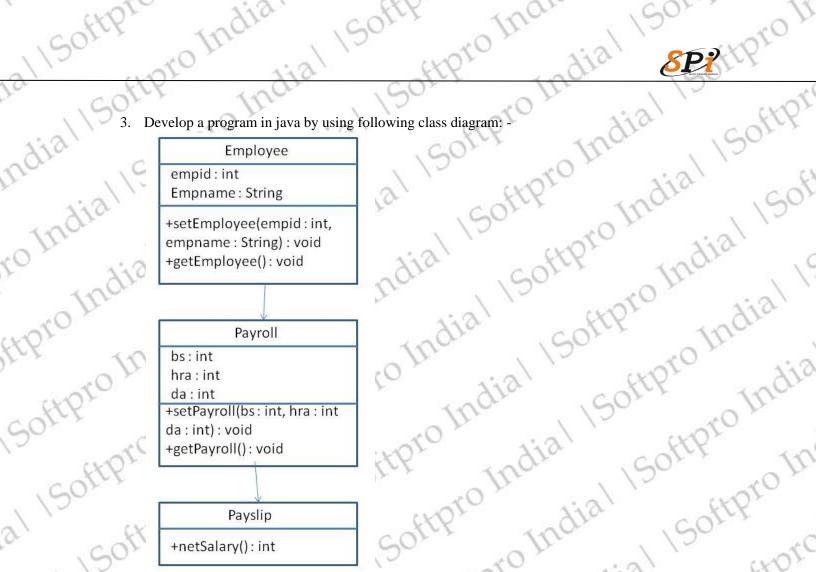
ro Indial

Softpro

oIndial



ndial | Soft



ial South,

oIndial

al Softpi

```
Softpro Indial Softpro Indial Softpro Indial Softpro Indial
                                                                                                                                                                                                                                                                  Hian Softpro India (Softpro India)
                                                                                                                                                                                                                                             .e) Softpro India | Softpro In
                                                                                                                                                                                                                                                                                                                     Adia | Softpro India | Softpro
ndial |Soft
                                                                                                                                                                                                                 India.
                                                                                                  العتر Id="+empid);

...ployee Name="+empname);

...rayroll extends Employee

int bs, hra,da;
void setPayroll(int b,int h,int d)
                                                                                                       class Employee
itPro India
SoftproIn
```



```
ndial Softpro Incha
                                                                                                                                                                                                        softproindial Softproindial
                                                                                                                                                                                Indial |SoftPro
                                                                                                                                                         Indial
                                                                         ...ura);
...ends Payroll
...oid netSalary()
{
System.out.println("Net Salary="+(bs+hra+da));
}
:lass InDemo3
ublic static void main/6
yslip r
                                                                                                                                                                                                                           oftpro Indial | Softpro Indial | Softpro
                                                                                                                                                                                                                                                                                 o Indial Softpro India
                                                                                                                                                                                                                                                    Softpro Indial Softpro In
                                                                                                                                                                                                                                                                           SoftPro Indial SoftPro
                                                                              Payslip ps=new Payslip();
                                                                               ps.setEmployee(1001,"Rajat Singh");
                                                                               ps.setPayroll(35000,10000,15000);
                                                                              System.out.println("*******PAY SLIP*******")
                                                                              ps.getEmployee();
                                                                               ps.getPayroll();
                                                                              ps.netSalary();
```

Horo mini

tial 150m

Interview Ouestions: -

ro India

- 1. What do you mean by inheritance?
 - Ans: Inheritance is a feature of object oriented programming. In Inheritance, you can create a new class by using existing class. The existing class is called base class and new created class is called derived class.
- 2. How to achieve inheritance concept and inheritance is also known as?
 - Ans: Inheritance is implemented by using extends keyword. Inheritance is also called 'Reusability'.



3. How many types of inheritance are there in java and how many types of inheritance are Etpro Indial not supported by Java? tpro Indial | Sof

Ans: - There are three types of inheritance which are supported in Java: -

- Single Inheritance i.)
- ii.) Hierarchical Inheritance
- Multi-level Inheritance

Multiple Inheritance is not supported in Java.

What is the purpose of "extends" keyword?

Ans: - The "extends" keyword is used to implement inheritance.

What is the difference between child class and parent class?

Ans: - In Inheritance, existing class is called parent class and new created class is called child class. ndial Softpro In Jial Soft

What is the root class for all Java classes?

Ans: - Object is the root class for all Java classes.

How to prevent inheritance concept?

30ftPro Indial SoftPro Ans: - By using private keyword, you can prevent inheritance concept.

8. How to call super class constructors?

Ans: - Constructor of super class is called by using super keyword.

9. Is it possible to use both super and this keyword inside the method?

Jial Softpro Indial Soft Ans: - Both this() and super() cannot be used together in constructor.

10. One class is able to extends how many classes at a time?

Ans: - One class is able to extends only one class at a time.

Multiple Choice Ouestions:

- 1. Which of this keyword must be used to inherit a class?
 - a) super
 - b) this
 - c) extent
 - d) extends
- Which of these is correct way of inheriting class A by class B?
 - a) class B + class A {}
 - b) class B inherits class A {}

lial | Softpro Indial | S

1 Softpro India



	Die 119, 26th 2001, 201, 11
~ O.	170, 190,
, 150	110 809
2/1	c) class B extends A {} d) class B extends class A {} 3. What is not a type of inheritance? a) Single inheritance b) Double inheritance c) Hierarchical inheritance d) Multiple inheritance d) Multiple inheritance 4. Using which of the following, multiple inheritance in Java can be implemented? a) Interfaces b) Multithreading c) Protected methods d) Private methods 5. All classes in Java are inherited from which class? a) java.lang.class b) java.class.inherited c) java.class.object d) java.lang.Object
10	Ofter was Box of the
, 10	c) class B extends A ()
0 1	d) class B extends class A {}
410	What is not a type of inheritance?
Tro.	a) Single inheritance
	h) Double inheritance
710	c) Hierarchical inheritance
100	d) Multiple inheritance
"O Tr	d) class B extends class A {} 3. What is not a type of inheritance? a) Single inheritance b) Double inheritance c) Hierarchical inheritance d) Multiple inheritance 4. Using which of the following, multiple inheritance in Java can be implemented? a) Interfaces b) Multithreading c) Protected methods d) Private methods 5. All classes in Java are inherited from which class? a) java.lang.class b) java.class.object d) java.lang.Object 6. In order to restrict a variable of a class from inheriting to subclass, how variable should be declared? a) protected b) private c) public d) static Answer Key: - 1. d 2. c 3. b 4. a 5. d 6. b Fill in the blanks Questions: - keyword is used to perform inheritance,
10	4. Using which of the following, multiple inheritance in Java can be implemented?
40	a) Interfaces
0 1	b) Multithreading
	c) Protected methods
477	d) Private methods
),	sit to to the state of the
20	5. All classes in Java are inherited from which class?
ELL	a) java.lang.class
20,	b) java.class.inherited
10	c) java.class.object
54	d) java.lang.Object
(00)	1110 1150
1/2	40 .3/
al 50ft	6. In order to restrict a variable of a class from inheriting to subclass, how variable should be
	declared?
()	a) protected
112	b) private
- grow	c) public
Tro ,	d) static
0	The cold did the cold cold
210	Answer Key: -
100	1. d 2. c 3. b 4. a 5. d 6. b
0 -	10 th
10	fill in the blanks Questions: -
40 3	1 keyword is used to perform inheritance.
107	Ans: - extends.
CL	100 100
	2 is not supported in Java.
COL	Ans: - Multiple Inheritance
CHIL	3. Single base class and multiple derived classes is called inheritance.
50	Ans: - Hierarchical
	The rise, the same court was
- 260	4. Concept of inheritance is also called of code.
150.	Ans: - Reusability
110	The state of the
3.	(4) (2) (30)
	Softpro India Computer Technologies P Ltd Page 84
1 10	The state of the s
1:2	ELL - 91, COI, 10, 10, 120,

Java Lecture - 09

(Polymorphism in Java)

Long Answer Questions: -

What is Polymorphism? Write its importance.

Pro Indial Polymorphism: - The term "Polymorphism" means "One Thing Many Forms".

There are two types of Polymorphism in Java: -

- Compile Time Polymorphism (Overloading)
- ii. Run Time Polymorphism (Overriding)

Compile time polymorphism [Overloading]: -

- 1) If java class allows two methods with same name but different number of arguments such type of methods are called overloaded methods.
- We can overload the methods in two ways in java language
- By passing different number of arguments to the same methods.

void m1(int a){}

void m1(int a,int b){}

Provide the same number of arguments with different data types.

void m1(int a){}

void m1(char ch){}

- If we want achieve overloading concept one class is enough.
- It is possible to overload any number of methods in single java class.

Method overloading: - In Java programming language you can give same name to multiple methods but their arguments should be different. Based on method arguments it is decided at compilation time that which method call from where. It is called method overloading,

Run Time Polymorphism or Method Overriding: Re-writing of base class method into derived class is called method overriding.

Write the difference between method overloading and method overriding.

Ans: - Difference between method overloading and method overriding is given below:

Method Overloading	Method Overriding
Method overloading is used to increase the readability of the program.	Method overriding is used to provide the specific implementation of the method that is already provided by its super class.
Method overloading is performed within class.	Method overriding occurs <i>in two classes</i> that have IS-A (inheritance) relationship.



In case of method overloading, parameter must be different.	In case of method overriding, parameter must be same.
Method overloading is the example of compile time polymorphism.	Method overriding is the example of <i>run time</i> polymorphism.
performed by changing return type of the method only. Return type can be same or	Return type must be same or covariant in method overriding.
different in method overloading. But you must have to change the parameter.	dial coffpre

3. What is a constructor? What is constructor overloading?

Ans: - Constructor: - Constructor is a special method which is used to initialize final variables.

Constructor has following properties: -

- i.) Constructor name is same class name.
- ii.) Constructor has no return type.
- iii.) Constructor is called automatically as soon as the object is created.

Constructor overloading: - The class contains more than one constructor with same name but different arguments is called constructor overloading.

Short Answer Questions: -

1. What is Polymorphism?

Ans: - The term Polymorphism means one thing many forms. In Java there are two types of Polymorphism: -

- i.) Compile time polymorphism
- ii.) Run time polymorphism
- 2. What is method overloading?

Ans: - Method Overloading: - In Java, we can create multiple methods with same name but their parameters are different, this is called method overloading.

3. What is method overriding?

Ans: - Method Overriding: - The re-writing of base class method into derived class is called method overriding.

4. What is constructor overloading?

Ans: - The class contains more than one constructor with same name but different arguments is called constructor overloading.



Technical Tasks: -

50

Olnaia

1. Create a class with name Figure, make three method with same name area (method overloading). In first method find the area of square, second method find the area of circle and third method find the area of rectangle. Now test the class Figure.

HPTO MINI

dial 150m

```
Indial |SoftPro India
                                                   dial Softpi
class OverloadingDemo
{
  public static void main(String [] args)
  {
  int s,l,b,a1,a2;
  touble r,a3;
  canner sc=new Scanner
  gure fig=new F<sup>i</sup>
  stem.out r
  c.p.
 import java.util.*;
                                             dia
                                                        Softpro Indial Softpro In
s=sc.nextInt();
System.out.print("Enter side of square : ");
l=sc.nextInt();
b=sc.nextInt();
System.out.print("Enter length and breadth of rectangle : ");
l=sc.nextInt();
b=sc.nextInt();
System.out.print("Enter radius of circle : ");
=sc.nextDouble();
l=fig.area(s);
2=fig.area(l,b);
3=fig.area
                                                     Indial | Softpro India
                                                              Indial | Softpro Indial | S
                                                                                    SoftproIndia
 a3=fig.area(r);
 System.out.println("Area of square="+a1);
 System.out.println("Area of rectangle="+a2);
 System.out.println("Area of circle="+a3);
```



indial 15 2. Develop a program in Java to demonstrate the concept of method overriding.

dial 150m

Etpro IIIu

ial |SortPi

ro Indial

SoftPro

oIndial

Softpro

pro India

```
Softpro Indial Softpro India Softpro India
                                                                         public void m3()
{
System.out.println("m3 of B");
}
lass OverridingDemo

iblic static "
                                                                          .... of A");

... void m2()

{
System.out.println("m2 of A");
}
}
slass B extends A

ouh:
                                                                                                                     args) Softpro India (Softpro India)
                                                                                                                                                             rate
al Softpr
                                                                                                                                                                                                                                       nk T
ndial Sof
                                                                                 A a1=new A();
                                                                                 a1.m1();
                                                                                 a1.m2();
                                                                                 B b1=\text{new B}();
tpro India
                                                                                 b1.m1();
                                                                                 b1.m2();
                                                                                 b1.m3();
```

Develop a program in Java to create a class Bank. In Bank class, create a method interest() which return the bank interest as 0. Now create two classes Sbi and Pnb, these classes inherits the Bank class. In Sbi and Pnb classes, override the interest() method and return the value of interest as per ro India Softpre al Softpr Softpro Ind bank norms. Now test the classes.



```
class Sbi extends Bank
{
public double interest*
{
return 7.5:
}
                                                                           class Pnb extends Bank
{
public double interest()
{
return 7.0;
}
ass Tee
                                                                                                                                                   dia Softpro India Softpro Indi
                                                                             ctass Test
{
public static void main(String [] args)
{
Sbi sb=new Sbi();
}ystem.out.println("Interest ref
the pb=new Pnb();
*/stem.out.printlp"
                                                                              ....g [] args)

_w Sbi();

_ystem.out.println("Interest rate of sbi="+sb.interest());

Pnb pb=new Pnb();

System.out.println("Interest rate of Pnb : "+pb.interest());

}

w Ouestions: -

het '
al Softpr
                                                                                                                                                                                                                                      SE SE
ndial |Soft
                                                                                                                                                                                                                                                                                                        ing r
```

Interview Questions: -

Softpro

oIndial

tpro

Softpro

1. What do you mean by polymorphism?

ere India Polymorphism: - The term Polymorphism means one thing many forms. In Java there HPro Indial 12 are two types of Polymorphism.

- ar i.) ii.) Compile Time Polymorphism i.)
 - Run Time Polymorphism



What do you mean by method overloading and method overriding?

Method Overloading: - In Java, you can create multiple methods with same name but their parameters are different, this is called method overloading.

Method Overriding: - The re-writing of base class method into derived class is called method overriding.

- 3. How many types of overloading are there in Java?
 - In Java there are two types of overloading: -
 - Method Overloading
 - ii.) Constructor Overloading.
- What do you mean by constructor overloading?

Constructor Overloading: - The class contains more than one constructors with same name but different arguments is called constructor overloading.

5. What are rules are to be followed while performing method overriding?

Rules for performing method overriding: -

- Class must be inherited.
- Base class method name and derived class method name must be same. ii.)
- iii.) Base class method parameters and derived class method parameters must be same.
- iv.) Base class method return type and derived class method return type can be same.
- Base class method modifier and derived class method modifier can be same or derived class method modifier should be low precedence.
- 6. What is the purpose of final modifier in Java?

Ans: - Java final keyword is a non-access specifier that is used to restrict a class, variable, and method. If we initialize a variable with the final keyword, then we cannot modify its value. If we declare a method as final, then it cannot be overridden by any subclasses.

Multiple Choice Questions:

- 1. What is the process of defining two or more methods within same class that have same name but different parameters declaration? Indial | Sof
 - a) method overloading
 - b) method overriding
 - c) method hiding
 - d) None of the mentioned above
- Which of these can be overloaded?
 - a) Methods



(Our	118, Les 101, 201, 201, 11
C. Stok	170, 180, 11, 12
150	b) Constructors c) All of the mentioned d) None of the mentioned Which of this keyword can be used in a subclass to call the constructor of superclass? a) super
2 .	b) Constructors c) All of the mentioned d) None of the mentioned Which of this keyword can be used in a subclass to call the constructor of superclass? a) super b) this c) extent d) extends What is the process of defining a method in a subclass having same name & type signature as a method in its superclass? a) Method overloading b) Method overriding
10	11 10 10 10 11 11 11 11 11 11 11 11 11 1
, 150	h) Constructors
.: 2/1	c) All of the mentioned
910	d) None of the mentioned
120	50 10 11 11 11
3.	Which of this keyword can be used in a subclass to call the constructor of superclass?
910	a) super
110	b) this
ro Indiala	c) extent
71	d) extends
100	190
Stpro Indi	d) None of the mentioned Which of this keyword can be used in a subclass to call the constructor of superclass? a) super b) this c) extent d) extends What is the process of defining a method in a subclass having same name & type signature as a method in its superclass? a) Method overloading b) Method overriding c) Method hiding d) None of the mentioned
CLO,	method in its superclass?
1701	a) Method overloading
40,	b) Method overriding
CKO	c) Method hiding
COLUL	d) None of the mentioned
Softpro	What is the process of defining a method in a subclass having same name & type signature as a method in its superclass? a) Method overloading b) Method overriding c) Method hiding d) None of the mentioned Which of these is correct way of calling a constructor having no parameters, of superclass A by subclass B? a) super(void); b) superclass.(); c) super.A(); d) super();
CKO,	subclass R?
COLUL	a) super(void):
al Softe	b) superclass.():
a (c) super.A();
CO1	d) super();
1 /2	979
Answ	er Key: -
-970	Which of these is correct way of calling a constructor having no parameters, of superclass A by subclass B? a) super(void); b) superclass.(); c) super.A(); d) super(); er Key: - a
110	132 Et
A. Arvin	Chor High Self work Con
<u>Fill i</u>	n the blanks Questions: -
1,1	The term means one thing many forms.
0	Ans: - Polymorphism
970	- COLUI 1500 COLUINION / /-
1/10-2.	The name is same as class name. Ans: - Constructor
00	Alis Collistractor
3.	Method name same, parameters are different is called
10	Ans: - Method Overloading.
500	Re-writing of base class method into derived class is called
EXP 4.	Ans: - Method Overriding
CO1,	111
5.	is applied in same class methods.
646,	Ans: - Method Overloading
(0)	111
110	210 (2) (40) 410 - 110
27	D. 100 100
	Softpro India Computer Technologies P Ltd Page 91

828



tpro India

Java Lecture - 10

(Interface in Java)

Long Answer Questions: -

- 1. What is interface? What are the usages of interface in Java?
 - Ans: Interfaces: -The Interface is the container of abstract methods and public static final variables. The key points of interface are given below: -
 - 1. Interface is also one of the types of class which contains only abstract methods. Interfaces are not alternative for abstract class but it is extension for abstract classes.
 - 2. The abstract class contains at least one abstract method but the interface contains only abstract methods.
 - 3. For the interfaces the compiler will generate .class files
 - 4. Interfaces give the information about the functionalities but do not provide the information about internal implementation.
 - 5. It is possible to declare any number of interfaces inside a source file. We declare the interfaces by using interface keyword. pro Indial Softpri Pro Indial

Softpro

Syntax: -

```
interface interface-name
//abstract methods
//public static final variables
```

What are the differences between interface, abstract class and class?

Ans: - Interface, Abstract class and class, A discussion: -

Interface: - If you have requirements, but you don't know about implementation. Then you can use interface, because the interface contain 100% of unimplemented (abstract) methods. The interface is used to achieve full abstraction.

- The interface can extend another interface.
- The interface can extend multiple interfaces.
- We can't create the object of interface.

Abstract class: - If you have requirements, you know about implementation, but not complete implementation then you can use abstract class, because abstract class contains 0-100% of implemented and unimplemented methods.



- The abstract class can implement interface.
- The abstract class can extend another abstract class.
- We can't create the object of abstract class.

Jial SoftPro Indial Class: - If you have requirements, you know about complete implementation then you can use class, because a class contains 100% implemented methods. Indial |Softp

- The class can implement an interface.
- The class can extend abstract class.
- The class can extend another class.
- We can create the object of class only.

Short Answer Questions: -

1. What is interface?

Ans: - The Interface is the container of abstract methods and public static final variables.

What is abstraction?

Ans: - Abstraction is a mechanism to show essential functionalities and hide all other functionalities of object.

How you can achieve abstraction using interface?

Ans: - Since interface contains abstract methods and public static final variables therefore interface is used to achieve full abstraction.

4. What is the difference between normal method and abstract method?

Ans: - Normal method contains method definition whereas abstract method contains only method declaration.

5. What is the difference between normal class and abstract class?

Ans: - Normal class contain all implemented methods whereas, abstract class contain abstract methods and implemented methods both.

6. How to prevent object creation in Java?

Ans: - In java we can avoid object creation in 2 ways:

- Making the class as abstract, so we can avoid unnecessary object creation with in the same class and another class.
- Making the constructor as private (Singleton design pattern), so we can avoid object creation in another class but we can create object in parent class.



Technical Tasks: -

1. Develop an interface named printable. In printable interface there is an abstract method print. Now implement printable interface and give the definition of print() method. In print() method give "Hello World" message.

```
import java.util.*;
interface printable
{
  void print();
}
class Test implements printable
{
  public void print()
{
    System.out.println("Hello World");
}
  public static void main(String [] args)
{
    Test t=new Test();
    t.print();
}
}
```

2. Develop an interface named Drawable. In Drawable interface create an abstract method named draw(). Now implement Drawable interface in Rectangle class and give definition of draw() method. And also implement Drawable interface in Circle class and give definition of draw() method. Now test the class Rectangle and Circle.

```
import java.util.*;
interface Drawable
{
  void draw();
}
  class Rectangle implements Drawable
{
  public void draw()
{
   System.out.println("This is rectangle");
  }
  }
  class Circle implements Drawable
{
  public void draw()
{
```



```
Softpro India, 100,
                                        nter"
indial | Sof
                              Pro Indial | SoftPro India
              System.out.println("This is circle");
              class Test
              public static void main(String [] args)
              Rectangle r=new Rectangle();
              Circle c=new Circle();
              r.draw();
              c.draw();
```

tial 150m

toro maia

ro Indial

al

ndial

o Indial

Softpro

Develop an interface named Bank. In Bank interface there is an abstract method rateOfInterest(). Now implement Bank interface to Sbi and Pnb classes and override the method rateOfInterest(). Now test the classes Sbi and Pnb.

```
Pro Indial SoftPro Indial Pro Indial Pro Indial
                  import java.util.*;
                  interface Bank
                                              ro Indial | Softpro Indial | Softpro
                  double rateOfInterest();
                  class Sbi implements Bank
                  public double rateOfInterest()
                                                             Jial SoftPro India
                  return 7.5:
                  class Pnb implements Bank
                                                                       11SoftPro Indial 15
                  public double rateOfInterest()
tpro India
                  return 7.0;
                  class Test
                                                                              SoftproIndia
                  public static void main(String [] args)
                  Sbi sb=new Sbi();
                  Pnb pb=new Pnb();
                  System.out.println("Interest rate of sbi: "+sb.rateOfInterest());
                  System.out.println("Interest rate of pnb : "+pb.rateOfInterest());
```



Develop two interfaces Printable and Showable. In Printable interface create an abstract method print() and in Showable interface create an abstract method show(). Now implement both interface in a class named TestMultipleInterface and override both methods print() and show(). Now test the class TestMultipleInterface.

ELDLO Mini

```
Softpro India
                             Idial |Softpro
import java.util.*:
                tpro Indial
                                ro Indial SoftPro Indial SoftPro
interface Printable
void print();
interface Showable
                             Softpro India | Softpro India
void show();
class TestMultipleInterface implements Printable, Showable
TestMultipleInterface tmi=new TestMultipleInterface();
tmi.print();
tmi.show();
public void print()
                           India | SoftPro India | SoftPro
                                   Jial 1 Softpro India
```

Interview Questions: -

What do you mean by method hiding?

Ans: - Method hiding can be defined as, "if a subclass defines a static method with the same signature as a static method in the super class, in such a case, the method in the subclass hides the one in the super class." The mechanism is known as method hiding. It happens because static methods are resolved at compile time.



Hal Softpro India

What is interface?

Ans: - Interface: - Interface is a collection of abstract methods and public static final variables.

3. What is abstract class?

Ans: - Abstract class is a collection of abstract methods and implemented methods both.

What is class?

Ans: - Class is the collection of variables and methods

5. What is difference between interface and abstract class?

Indial |Softpro India Ans: - Interface contains abstract methods only whereas abstract class contains abstract methods Pro Indial 150 and implemented methods both.

How many types of classes are there in Java?

Ans: - There are seven types of classes in Java: -

- static class i.)
- final class ii.)
- iii.) abstract class
- concrete class iv.)
- v.) singleton class
- vi.) pojo class
- vii.) inner class
- Normal class is also known as?

Ans: - Normal class is also known as concrete class.

What is the difference between normal method and abstract method?

Ans: - Normal method contains method definition whereas abstract method contains only method declaration.

What is the difference between normal class and abstract class?

Ans: - Abstract class contains abstract methods and implemented methods both whereas normal class contains implemented methods only.

10. Is it possible to create an object for abstract class?

Ans: - No, we cannot create object of abstract class.

11. Is it possible to declare main method inside the abstract class or not?

Ans: - Yes, it is possible to declare main method inside the abstract class.

12. In Java, is abstract class reference variable able to hold child class object?

1 Softpro India s, in Softpro India Ans: - Yes, in java abstract class reference variable is able to hold child class object

Softpro Inc

India 115



ndial 150m Multiple Choice Questions: -

(20)	Which of these keys a) interface b) Interface c) intf d) Intf	9,	(17)	201	(30)	tpro II
C. Stok	170	,50	2	7.	10	-40
, 150	Multiple Choic Which of these keys a) interface b) Interface c) intf d) Intf Which of these can a) Objects b) Packages c) Interfaces d) None of the Men Which of these acce a) Public b) Protected c) private d) All of the mention	110	···oro	132	8D3	16,
	1010	110	-666	× 201	ROFTPRO MOM	
10	(1) 11	101.	20,	Tr.	110	70
150	14 L: 1 CI :	0 "	~	(0)	2	146,
	Multiple Choic	e Questions: -	273	20		20,0
710	WH. 1 6.1 1	Chr.	CO > 1	Tire	, /	9
100	Which of these key	words is used to defin	e intertaces in Java?	200	1:21	CA
	a) interface	11	87	46,	gir	001
710	b) Interface	201	. 60	1.,	U	120
100	c) inti	Tri	1 / 2	40	0	1
*O Tr	a) intr	200	1:21	CKOx	710	-
10	William Calessa	1 1 6 . 11 1			120	10
1100	which of these can	be used to fully abstr	act a class from its in	ipiementation?	0,5	
O Jr.	a) Objects	40		040	1	710
	b) Packages	CKOT	210	COLLE	10	O
479	d) None of the Mon	tionad	100	150	10 1	
),	d) None of the Men	uonea	0	1,	401	7,19
2	Which of these acce	ace enacifiare can ha u	sed for an interface?	0	CL	120
ELL .	a) Public	ess specifiers can be u	ised for all interface:	150	(111
20,	h) Protected	1/20	40	1	Tour	-
10	c) private	21	101	7,10	- Stil	110
846	d) All of the mentio	ned o	11	101	50	O IT.
, 40,		, 150	0,7		, -	250
al Softp	Which of these keys a) interface b) Interface c) intf d) Intf Which of these can a) Objects b) Packages c) Interfaces d) None of the Men Which of these acce a) Public b) Protected c) private d) All of the mentio Which of these keys a) abst b) abstract c) Abstract d) abstract class If a class inheriting a) Abstract b) A simple class	words are used to def	ine an abstract class?	7,19,	64	7
2	a) abst	910	TIL	170	1000	
. 60	b) abstract	10	50	Oh	1 10	250
adial 150	c) Abstract		in i	11	9,	566
1:2	d) abstract class	410	FLE	1000	C	20,
- grow	COLLI	100	150	JI.	1 / "	20
5.	If a class inheriting	an abstract class does	not define all of its	function then it will b	e known as?	13
	a) Abstract	21	a g	Ch.	Ore	, GO)
Ala	b) A simple class	100	, 50,	1		10
1200	d) None of the ment	tioned	110	200	112	1
oIndial	a) Abstract b) A simple class c) Static class d) None of the ment	roned	719	ELL.	20110	, C
91	c of	11	10,	20,	Tire	1 /-
Angu	ver Key: -	40 1	//	~1	0	32
Allsv	el Key	anot	not define all of its	Function then it will b	e known as?	Tro
1.	a 2.	3.	. a 2	1. b	5. a	1
		20		1/2	00	.: 0
*0 *		1001	11	9, 6,	66,	970
CKOT	710	FILE	1200	(00)		1110
COLUL	100	150	OF	110	-40	
50	0 1	1	2010	1:12	C4.6 ,	2
1007	7,13	1.	CK	1012 C	20,0	115
COLLE	1201	100,	27	//	0	40
150	10 1	110	ipro Indi	122	CKY	2,
1 1	101	110	STY	alial Sof	5. a In	}
SoftPro II	o India Oro India Softp	(A)*	(3)			pro Ind
	Softp	ro India Com	puter Techno	Togrés P Ltd	Page 98	1)7
1 1	250	112	SXX	-03		Tres

EK. 6.1



- 64	bro ingia,	, GOPT	Tho	, 19	0, 10,
2/150,	1. In Java Ans: - Interface 2. Method which has only Ans: - Abstract Method 3. Class which has abstract Ans: - Abstract class 4. Normal class is also call Ans: - Concrete class	12/10	stpro.	dia	EP
19	OLLY INO	150	20	112	CYO
dia Fi	ll in the blanks Questio	ons: -	COFFE	India	150101
Vo.	1. In Java Ans: - Interface 2. Method which has only Ans: - Abstract Method 3. Class which has abstract Ans: - Abstract class 4. Normal class is also call Ans: - Concrete class 5. In Java, multiple inherita Ans: - Interface	is used to achiev	e abstraction	60,	ial co
India	2. Method which has only	declaration is known a	ıs <u>(</u> 1501°)	- ro Inc	13/120
10 11	 Method which has only Ans: - Abstract Method Class which has abstract Ans: - Abstract class Normal class is also call Ans: - Concrete class In Java, multiple inherita Ans: - Interface 	methods and implem	ented methods in know	wn as	India 1
" In	Ans: - Abstract class	anethods and implem	onted methods in know	CLOLO	dial
4. Line	4. Normal class is also call Ans: - Concrete class	ed	ugice "	50111	to Inc.
orm	5. In Java, multiple inherita	ances are possible by _	1:2	54.6	97
Softh	Indi	Sor.	co Inc	1/20	croro
Et	6, 4910	COLLY	Tho	150	Dr. Di
1150	oro II.	18/13	LOTO.	dial	COELBIG
a.,	Office Ino	150	in to	rice.	150
112/	FIFTO	adia,	COETS,	India	Softe
TOY	190°	11.	(30)	0 2	12/ 008
india,	Softy	India	1/2011	"O Inc.	150
0 11.	ial STP	40	131, 00	th.	ugia 1
Tho	1/50,	aro III	1:3/150	choro,	dial
CPTO T	adia, 'co	ELD.	udie	Softi	:O Inc.
oro	113/13	EXPTO	dial	COFT P	India
Polich	Indie	Sor.	Olive	3/150	. wro h
5779	 Ans: - Abstract class 4. Normal class is also call Ans: - Concrete class 5. In Java, multiple inherita Ans: - Interface 	COFTS	Indi	(50	Tr. Tu
150,	oro lin	2/13-	+pro	dial	676
	Softpro	India Comput	er Technologi	es P_Ltd Pa	ge 99
	work	110	- Sth.	2 die	COLLY



pro Indial 15

Java Lecture - 11

(Exception Handling)

Long Answer Questions: -

1. What is Exception? How many types of exceptions in Java?

Information regarding Exception: -

- ❖ Dictionary meaning of the exception is abnormal termination.
- ❖ An expected event that disturbs or terminates normal flow of execution is called exception.
- ❖ If the application contains exception then the program is terminated abnormally & the rest of the application is not executed.
- To overcome above limitation in order to execute the rest of the application, it must handle the exception.

Types of Exceptions: - As per the Sun Micro Systems standards, the Exceptions are divided into three types:

- 1) Checked Exception
- 2) Unchecked Exception
- 3) Error

Checked Exception: -

- ✓ The Exceptions which are checked by the compiler at the time of compilation is called Checked Exceptions. **IOException**, **SQLException**, **InterruptedException**......etc.
- ✓ If the application contains checked exception the code is not compiled. The checked Exception is handled in two ways
 - By using try-catch block.
 - > By using throws keyword.
- ✓ If the application contains checked Exception the compiler is able to check it and it will give intimation to developer regarding Exception in the form of compilation error.

Unchecked Exception: -

- ✓ The exceptions which are not checked by the compiler at the time of compilation are called unchecked Exception.
 - Arithmetic Exception, Array Index Out Of Bounds Exception, Number Format Exception....etc
- ✓ If the application contains un-checked exception, code is compiled but at runtime JVM (Default Exception handler) display exception message & program is terminated abnormally.
- ✓ To overcome runtime problem must handle the exception in two ways.
 - > By using try-catch blocks.



By using throws keyword.

Error:

- Errors are caused due to lack of system resources like Heap memory full, Stack memory problem, AWT component problems.....etc
 - Ex: StackOverFlowError, OutOfMemoryError, AssertionError......etc
- Exceptions are caused due to developers mistakes or end user supplied inputs but errors are caused due to lack of system resources.

We can handle the exceptions by using try-catch blocks or throws keyword but we are unable to handle the errors.

What is Exception handling in Java? How many types of exception handling are there in Java?

Exception Handling: -

- The main objective of exception handling is to get normal termination of the application in order to execute rest of the application code.
- Exception handling means just we are providing alternate code to continue the execution of remaining code and to get normal termination of the application. stpro Indial Softpro
- Etpro Indial Every Exception is a predefined class present in different packages.

E.g.

java.lang.ArithmeticException java.io.IOException java.sql.SQLException javax.servlet.ServletException

The exception are occurred due to two reasons -

- a. Developer mistakes
- b. End-user mistakes
- i. While providing inputs to the application.
- ii. Whenever user is entered invalid data then Exception is occur.
- iii. A file that needs to be opened and is not found then Exception is occurred.
- iv. Exception is occurred when the network has disconnected at the middle of the communication.



Short Answer Questions: -

1. What is exception?

Ans: - Exception: - Dictionary meaning of exception is abnormal termination, when exception is occurred program is terminated abnormally and rest of the code is not executed.

In Java there are three types of exceptions: -

- **Checked Exception**
- ii.) **Unchecked Exception**
- iii.) Error
- What is checked exception?

Ans: - Checked exceptions are identified by compiler at compilation time. E.g. FileNotFoundException, ClassNotFoundException, IOException, SQLException etc.

What is unchecked exception?

Ans: - Unchecked exceptions are occurred at run time.

E.g. ArithmeticException, ArrayOutOfBoundsException, NullPointerException .. etc

4. What is error?

Ans: - Errors are occurred due to lack of system resources.

E.g. IOError, AwtError, HeapMemoryFullError... etc.

What is exception handling?

Ans: - Exception handling: - Exception handling is a mechanism to handle exception to achieve normal execution of program. rpro Indial

How many types of exception handling?

- By using try-catch block
- ii.) By using throws keyword.
- 7. What is difference between throw and throws?

normal execution of program. How many types of exception handling? Ans: - In Java, there are two types of exception. By using try-catch block. ii.) By using throws keyword. What is difference between throw and throws	Soler De May 13 150.
throw	throws
Java throw keyword is used to explicitly throw an exception.	Java throws keyword is used to declare an exception.
Checked exception cannot be propagated using throw only.	Checked exception can be propagated with throws.
Throw is followed by an instance.	Throws is followed by class.
Throw is used within the method.	Throws is used with the method signature.
You cannot throw multiple exceptions.	You can declare multiple exceptions e.g. public void method()throws IOException, SQLException.

8. Which keywords are used for exception handling in Java?

Ans: - For exception handling we use try, catch, finally, throw and throws keywords.



Technical Tasks: -

to India

1. Develop a program in Java to demonstrate concept of exception handling, take the example of divide by zero exception.

import java.util *-

Ethio mini

High 150mm

```
pro Indial | Softpro Indial | Soft
Scanner sc=new Scanner(System.in);
System.out.println("Enter two numbers");
try
{
x=sc.nextInt();
/=sc.nextInt();
=x/y:
catch(InputMismatchException ex1)
{
System.out.println("Enter numbers only");
}
catch(ArithmeticException ex2)
{
System.out.println("Are vornally
...ex1)
...an("Enter numbers only");
catch(ArithmeticException ex2)
{
System.out.println("Are you trying to / by zero?");
}
finally

'ystem.out.println("This is fine"
                                             ial Softpro Indial Softpro In
                                                                oftpro Indial Softpro
```

Write a program in Java to display name and roll number of students. Initialize respective array variables for 10 students. Handle ArrayIndexOutOfBoundsExeption, so that any such problem doesn't cause illegal termination of program.

```
SoftproIndia
                                          Indial | Sc
class Test
public static void main(String [] args)
int x[]=\{10,20,30,40,50\};
```



```
SoftPro India
                                          Softpro Indial 1
for(int i=0; i<=5; i++)
                                                          o Indial Sof
System.out.println(x[i]);
catch(ArrayIndexOutOfBoundsException ex)
System.out.println("Array index is out of bounds");
```

Storo Mini

3. Develop a program in Java to handle a checked exception ClassNotFoundException.

```
ro Indial |Softpro
class Test
                                       Indial
                                        Apro Indial Soft Pro In
public static void main(String [] args)
try
                                            Etpro Indial Softpro
Class.forName("com.mysql.jdbc.Driver");
catch(ClassNotFoundException ex)
System.out.println("Jdbc driver is not available");
```

Interview Questions: -

What do you mean by Exception?

Pro Mara

Ans: - Dictionary meaning of exception is abnormal termination. When exception is occurred program is terminated abnormally and rest of code is not executed. 1 Softpro

How many types of exceptions are there in Java?

Ans: - In Java, there are three types of exceptions: -

- checked exception
- ii.) unchecked exception
- iii.) errors
- What is the difference between Exception and error?

Ans: - Exceptions are generated due to users and programmers mistake whereas errors are generated due to lack of system resources.



What is the difference between checked Exception and un-checked Exception?

Ans: - checked exceptions are identified by compiler at compilation time, whereas unchecked pro India exceptions are generated at runtime.

Errors are caused by?

Ans: - Errors are generated due to lack of system resources.

6. Is it possible to handle Errors in Java?

Ans: - No, we can handle errors in Java.

What do you mean by exception handling?

Ans: - Exception handling is a mechanism to handle exception to achieve normal execution of program.

How many ways are there to handle the exception?

Ans: - There are two ways to handle the execption: -

- By using try-catch blocks
- By using throws keyword
- What is the root class of Exception handling?

Ans: - Exception is the root class of exception handling.

10. Can you please write some of checked and un-checked exceptions in Java?

Ans: -

Checked Exceptions: - ClassNotFoundException, FileNotFoundException, IOException ..etc. Unchecked NullPointerException, **Exceptions:** ArithmeticException, ArrayIndexOutOfBoundsException....etc.

11. What are the keywords present in Exception handling?

Ans: - try, catch, finally, throws and throw keywords are used for exception handling.

12. What is the purpose of try block?

Ans: - try block contain the code which you want to protect.

13. In Java, is it possible to write try without catch or not?

Ans: - In Java, you cannot write try block without catch.

14. What is the purpose of finally block?

Indial | SoftPro Indial Ans: - In finally block you can write code which you want to execute always.

Multiple Choice Questions: -

- 1. Which of these keywords is not a part of exception handling?
 - a) try
 - b) finally
 - c) thrown
 - d) catch



CV	Tig, ofth man con it
COL	100, 100, 100
1120	SPACE SPACE
19,	2. Which of these keywords must be used to monitor exceptions? a) try b) finally c) throw d) catch 3. Which of these keywords is used to manually throw an exception? a) try b) finally c) throw d) catch 4. Which of the following classes can catch all exceptions which cannot be caught? a) RuntimeException b) Error c) Exception d) ParentException 5. Which of the following is a super class of all exception type classes? a) Catchable b) RuntimeExceptions c) String d) Throughla
. 15	
1:2/1-	a) try
gia	b) finally
III	c) throw
112	d) catch
ro India	2. Which of these keywords is used to manually throw an expension?
ro Ind	a) try
10	b) finally
10,	c) throw
10	d) catch
ELG,	4. Which of the fellowing closes on estab all quantions which council be countable.
),,,,	a) RuntimeException
TO	b) Error
ELL.	c) Exception
50	d) ParentException
CV	
COL	a) Catchable
1/20	b) RuntimeExceptions
2	c) String d) Throwable
19	 4. Which of the following classes can catch all exceptions which cannot be caught? a) RuntimeException b) Error c) Exception d) ParentException 5. Which of the following is a super class of all exception type classes? a) Catchable b) RuntimeExceptions c) String d) Throwable
An	4. Which of the following classes can catch all exceptions which cannot be caught? a) RuntimeException b) Error c) Exception d) ParentException 5. Which of the following is a super class of all exception type classes? a) Catchable b) RuntimeExceptions c) String d) Throwable swer Key: - 1. c 2. a 3. c 4. c 5. d
719,	1. c 2. a 3. c 4. c 5. d
Vo.	Win the blanks of the state of
Fi	ll in the blanks: -
9110	
Tire	1. The dictionary meaning of is abnormal termination. Ans: - Exception
0	19, Ethy office of the
100	2. The exceptions caught at compilation time is known as exception. Ans: - Checked
*O P	Tig, the gran
×01	3. The exceptions caught at run time is known as exception.
101	Ans: - Unchecked
070	4. The exceptions raised due to lack of system resources are called
E416.	Ans: - Errors
30,	5 is used to raise user defined exception.
-140	Ans: - throw
C OF CY	1001 1001 111 120 10 1
150	TO I TO TO THE CHOICE
1/	CADI TIS COLLET
	Softpro India Computer Technologies P Ltd Page 106

EXP



Java Lecture ·

12 (Multithreading)

Long Answer Questions: -

1. What is multithreading? Write difference between multithreading and multitasking.

Information about multithreading: -

- 1) In the earlier days, the computer's memory use to be occupied with only one program at a time and after completion of one program, it was possible to execute another program, this is called uni programming.
- 2) When one program execution is completed then only second program execution can be started such type of execution is called co-operative execution. This execution has a lot of disadvantages.
 - a. Most of the times, memory is wasted.
- b. CPU utilization will be reduced because only one program is allowed to be executed at
 - c. The program queue is developed on the basis co-operative execution.

To overcome above problem a new programming style was introduced and is called multiprogramming.

- 1) Multiprogramming means executing more than one program at a time.
- 2) All these programs are controlled by the CPU scheduler.
- Softpro Indial Soft 3) CPU scheduler will allocate a particular time period for each and every program.
- 4) Executing several programs simultaneously is called multiprogramming. SoftPro Indial 15
- 5) In multiprogramming a program can be entered in different states.
 - a. Ready state.
 - Running state.
 - c. Waiting state.
 - 6) Multiprogramming mainly focuses on the number of programs.

Advantages of multiprogramming: -

The main advantage of multiprogramming is to provide simultaneous execution of two or more parts of an application to improve the CPU utilization.



- 2. CPU utilization will be increased.
- 3. Execution speed will be increased and response time will be decreased.
- 4. CPU resources are not wasted.

Thread: -

- 1) Thread is nothing but separate path of sequential execution.
- 2) The independent execution technical name is called thread.
- 3) Whenever different parts of the program are executed simultaneously then that each and every part is called thread.
- 4) The thread is light weight process because whenever we are creating thread it is not occupying the separate memory it uses the same memory. Whenever the memory is shared means it is not consuming more memory.
- 5) Executing more than one thread at a time is called multithreading.

Difference between Multithreading and Multitasking: -

100		
115	Multitasking	Multithreading
3, 36	In multitasking, users are allowed to	While in multithreading, many threads are created
150	perform many tasks by CPU.	from a process through which computer power is increased.
112,	M live II	
VOr. (C	Multitasking involves often CPU	While in multithreading also, CPU switching is
, , , , ,	switching between the tasks.	often involved between the threads.
dia.	In multitasking, the processes share	While in multithreading, processes are allocated
Thomas	separate memory.	same memory.
0	Multitasking component involves	While multithreading component does not involve
Indica	multiprocessing.	multiprocessing.
40 7	In multitasking, CPU is provided in order	While in multithreading also, CPU is provided in
101	to execute many tasks at a time.	order to execute many threads from a process at a
Tr.	, 150	time.
and to	In multitasking, processes don't share	While in multithreading, each process share same
COLLA	same resources, each process is allocated	resources.
70	separate resources.	119, 646,



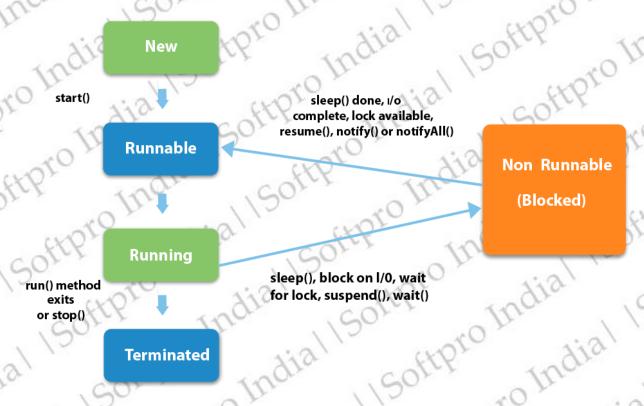
2. Explain thread life cycle in Java.

Thread Life Cycle: - A thread can be in one of the five states. According to Sun, there are only 4 states in **thread life cycle in java** - new, runnable, non-runnable and terminated. There is no running state.

But for better understanding the threads, we are explaining it in the 5 states.

The life cycle of the thread in java is controlled by JVM. The java thread states are as follows:

- i.) New
- ii.) Runnable
- iii.) Running
- iv.) Non-Runnable (Blocked)
- v.) Terminated



- 1) New: -The thread is in new state if you create an instance of Thread class but before the invocation of start() method.
- **2) Runnable: -**The thread is in runnable state after invocation of start() method, but the thread scheduler has not selected it to be the running thread.
- 3) Running: -The thread is in running state if the thread scheduler has selected it.
- **4) Non-Runnable (Blocked): -**This is the state when the thread is still alive, but is currently not eligible to run.
- 5) **Terminated:** -A thread is in terminated or dead state when its run() method exits.



tpro Indial

3. How many types of thread can be created in Java? Explain.

Creating Thread: - A thread can be created in two ways: -

- 1) By extending Thread class.
- 2) By implementing java.lang.Runnable interface.

First approach to create thread extending Thread class: -

Step 1: - Our normal java class will become Thread class whenever we are extending predefined Thread class.

```
class MyThread extends Thread {
```

Step 2: - override the run() method to write the business logic of the Thread(run() method present in Thread class).

```
class MyThread extends Thread {
public void run() {
System.out.println("business logic of the thread");
System.out.println("body of the thread");
                                                         Etpro Indial
```

Step 3: - Create userdefined Thread class object.

MyThread t=new MyThread();

Step 4: - Start the Thread by using start() method of Thread class.

t.start();

Example Application: -

```
stpro Indial 150ft
                                              Indial | Softpro In
class MyThread extends Thread //defining a Thread
//business logic of user defined Thread
public void run()
for (int i=0; i<10; i++)
System.out.println("userdefined Thread");
```



```
};
class ThreadDemo {
  public static void main(String[] args) //main thread started
  {
    MyThread t=new MyThread(); //MyThread is created
    t.start(); //MyThread execution started
    //business logic of main Thread
    for (int i=0;i<10;i++)
    {
        System.out.println("Main Thread");
    }
    }
};</pre>
```

Flow of execution: - Whenever we are calling t.start() method then JVM will search start() method in the MyThread class but since it not available so JVM will execute parent class(Thread) start() method. Thread class start() method responsibilities

- a. User defined thread is registered into Thread Scheduler then only it decides new Thread is created.
- b. The Thread class start() automatically calls run() to execute logics of user defined Thread.

Second approach to create thread implementing Runnable interface: -

Step 1: -our normal java class will become Thread class whenever we are implementing Runnable interface.

```
class MyClass implements Runnable {
};
```

Step2: override run method to write logic of Thread.

```
class MyClass implements Runnable {
  public void run() {
   System.out.println("Ajay from Softpro");
   System.out.println("body of the thread");
  }
}
```

```
Step 3: - Creating an object.
```

MyClass obj=new MyClass();

Step 4: - Creates a Thread class object.



After new Thread is created it is not started running until we call start() method. So whenever we are calling start method that start() method call run() method then the new Thread execution started.

```
Thread t=new Thread(obj);
t.start();
```

Example Application: - Creation of Thread implementing Runnable interface .

```
class MyThread implements Runnable {
    public void run() { //business logic of user defined Thread
    for (int i=0;i<10;i++) {
        System.out.println("userdefined Thread");
    }
    .
};
class ThreadDemo {
    public static void main(String[] args) //main thread started
    {
        MyThread r=new MyThread(); //MyThread is created
        Thread t=new Thread(r);
        t.start(); //MyThread execution started
        //business logic of main Thread
        for (int i=0;i<10;i++)
        {
              System.out.println("Main Thread");
        }
        }
        }
};
```

Example Application: - Creating two threads by extending Thread class using anonymous inner classes.

```
class ThreadDemo {
  public static void main(String[] args) {
    Thread t1 = new Thread() //anonymous inner class
  {
    public void run()
    {
        System.out.println("user Thread-1");
    }
    };
    Thread t2 = new Thread() //anonymous inner class
    {
        public void run()
```



```
ndial | SoftPro Invia
                             Pro Indial | Softpro Indial | Softpro Indial
                                          Indial | Softpro Indial | Softpro
                                   ro Indial Softpro Indial
                System.out.println("user thread-2");
                                                   dial Softpro Indial Softpro Indial Softpro Indial Softpro India
                t2.start();
               };
```

Short Answer Questions: -

- 1. What do you mean by Thread? Ans: - Thread is just like sub-process.
- What is the difference between process and thread? Ans: - A program under execution is called process. A thread is just like sub-process.

Jial 150IL

Softpre Technical Tasks: -

ro Indial

ndial 150

oIndial

30ftpro India Create a program in Java to print numbers from 100 to 1 with the delay of 1-1 seconds (Reverse Counter). Use the concept of multithreading.

```
SoftproIn
                                                                                                                                                Softpro Indial Softpro India 
tpro India
ca
{
Softpro
```

10

COL



2. Create a program in Java to create a thread by implementing Runnable interface.

dial 150m

ial |SortPr

indial 19

ro Indial

Softpro

al Softp

al

pro India

```
class ThreadDemo2
{
    public static void main(String []args)
{
     Thread1 t1=new Thread1();
     Chread t=new Thread(t1);
     start();
     vr(int i=1;i<=10^-)
                              Softpro Indial Softpro India
                                  Softpro Indial Softpro Indial Softpro Indial Softpro Indial
 System.out.println("Main: "+i);
```

Storo Min.

3. We create a class that extends the **java.lang.Thread** class. This class overrides the run() method available in the Thread class. A thread begins its life inside run() method. We create an object of our new class and call start() method to start the execution of a thread. Start() invokes the run() method on the Thread object.

```
Softpro Indial | Softpr
           Jass ThreadDemo1
{
public static void main(String [] args)
{
Soft
                                        Indial | SoftPro Indial | S
tpro India
SoftproTr
                                                   Softpro India
```

Soft



```
MyThread mt=new MyThread();
mt.start();
for(int i=1;i<=20;i++)
{
System.out.println("Main: "+i);
}
}
```

Interview Questions: -

1. What do you mean by Thread?

Ans: - A thread is a path of execution within a process. A process can contain multiple threads.

2. What do you mean by single threaded model?

Ans: - Single threaded processes contain the execution of instructions in a single sequence. In other words, one command is process at a time.

3. What is the difference between single threaded model and multithreaded model?

Ans: - Single threaded processes contain the execution of instructions in a single sequence. In other words, one command is process at a time.

The opposite of single threaded processes are multithreaded processes. These processes allow the execution of multiple parts of a program at the same time. These are lightweight processes available within the process.

4. What do you mean by main thread and what is the importance?

Ans: - Java provides built-in support for multithreaded programming. A multi-threaded program contains two or more parts that can run concurrently. Each part of such a program is called a thread, and each thread defines a separate path of execution.

When a Java program starts up, one thread begins running immediately. This is usually called the main thread of our program because it is the one that is executed when our program begins.

5. What is the difference between process and thread?

Ans: - Process-

Processes are basically the programs which are dispatched from the ready state and are scheduled in the CPU for execution. PCB(Process Control Block) holds the concept of process. A process can create other processes which are known as Child Processes. The process takes more time to terminate and it is isolated means it does not share the memory with any other process.

The process can have the following states like new, ready, running, waiting, terminated, suspended.



pro Indial 1

Thread-

Thread is the segment of a process means a process can have multiple threads and these multiple threads are contained within a process. A thread has three states: Running, Ready and Blocked.

Storo Mini

o Indial |Sof Thread takes less time to terminate as compared to process but unlike process threads do not isolate.

Multiple Choice Questions:

pro mou

- What is multithreaded programming?
 - a) It's a process in which two different processes run simultaneously

Jia 15011

- b) It's a process in which two or more parts of same process run simultaneously
- c) It's a process in which many different process are able to access same information
- India | Softpro India | Softpro India d) It's a process in which a single process can access information from many sources
- 2. Thread priority in Java is?
 - a) Integer
 - b) Float
 - c) double
 - d) long
- What requires less resources?
 - a) Thread
 - b) Process
 - c) Thread and Process
 - d) Neither Thread nor Process
- 4. What decides thread priority?
 - a) Process
 - b) Process scheduler
 - c) Thread
 - d) Thread scheduler
- dial Softpro Indial Softpro India Softpro SoftPro Indial SoftPro tion? , achron Which of these keywords are used to implement synchronization?
 - a) synchronize
 - b) syn
 - c) synch
 - d) synchronized

Answer Key: -

	c) Thread and Flocess
	d) Neither Thread nor Process
(20, 11, 12,
4.	What decides thread priority?
21	a) Process
	b) Process scheduler
	c) Thread
1:0	d) Thread scheduler
-950	CO11, 100, 120, 11,
5.	Which of these keywords are used to implement synchronization?
	a) synchronize
	b) syn
10	c) synch
0,	d) synchronized
	" 419, " FLL MOR COLOR 1200
Answ	er Key:
. (112 112
W.	b 2. a 3. a 4. d 5. d
CK	100, 100,

Etpro Ind



CYPTO	dia, coff	I mai	120, 11
100101	The 120	200 1:2	CONTOIL
all ox	To dia	ELLS, Cogre	SENT THEIR MISSA
COLL	Inc. 19	-ro 1	· al cross
Fill in th	<u>ie blanks Questions: -</u>	after me	Tra Gold
adre G	Thread is also called	130, 10 III	
4:2	Thread can be created by extends	class or implementing	adja Got
India 2	interface.	class of implementing	11/2
40 II 11 07	Ans: - I nread, Runnable	ia stp.	englia 10
170/11/3.	Ans: - start() method of Thread cl	ass is used to start thread.	10 II.
4.	method of Thread class	s is used to suspend thread for given	time.
Eth. Wg	Ans: - sleep()	mar 180	10 II.
oro II	in all	112	46, mg/10
Coff.	endia Gotth	ma 18	20 11.
150	is all our	10 112	- ofth,
coftly.	india copil	Indi	120, 10 II.
, 150	101	word dial	ELE
a' coft	india Go	tick Thou	190
150	Thread is also called	inoto 4.	131 ELB,
dia"	ELL MAJOR	COLLE INO	, 190
Va. 12.	2011	noro	112 St
dia	Coff. Indian	GOTTE	no. 180
Trick	150	all croro	dia
dia	COLLY ING	Cotter	Inc. 15
The	150	112 (10)	10 712
tore - 4.	ia, cotth, i	adje Gores	Inch
The	150 00	1ia lia	croro dia
CLOTO	dia coffe	Indie 150	The The
30,00	method of Thread class Ans: - sleep()	10 112/1	CLOLO
CKDIO	dia' cofth	Indie	Corre In
(2010)	Jun 120	201	COTO



dial

Java Lecture - 13

(Concept of Package)

Long Answer Questions: -

1. What is package? How many types of packages are there in Java?

Ans: In Java, James Gosling maintained predefined support in the form of packages and these packages contains classes & interfaces and these classes and interfaces contains predefined methods & variables.

Java-language----→ packages------→ classes and interfaces------→ methods and variables

Types of packages: - There are two types of packages in Java: -

- 1) Predefined packages
- 2) User defined packages

Predefined packages: The predefined packages are introduced by James Gosling and these packages contain predefined classes & interfaces and these class & interfaces contains predefined variables and methods. Example: - java.lang, java.io ,java.util.....etc

User defined packages: -

- The packages which are defined by user. These packages contain user defined classes and interfaces.
- Declare the package by using package keyword.

syntax: package package-name;

example: package com.softpro;

❖ Inside the source file it is possible to declare only one package statement and that statement must be first statement of the source file.

4472	
Example-1:valid	Example-3:Invalid
package com.softpro;	import java.io.*;
import java.io.*;	import java.lang.*;
import java.lang.*;	package com.softpro;
Example-2:Invalid	Example-4:Invalid
import java.io.*;	package com.sofpro;
package com.softpro;	package com.slc;
import java.io.*;	mair Gold



Pro India

Java.lang: -The most commonly required classes and interfaces to write a sample program is encapsulated into a separate package is called java.lang package.

Java _.aogram iage.

Etpro IIIus

Jial 150m

Note: - The default package in Java programming is java.lang package.

SoftproIndial o India Soften control of the section of the Java.io package: -The classes which are used to perform the input output operations are present in the ||Softpro Indial java.io packages.

Pro Indial | SoftPro Indial | S Java



ndia

Short Answer Questions: -

- 1. What do you mean by package and what it contains? Ans: - Package is the collection of classes, interfaces and sub-packages.
- What is the difference between user defined package and predefined package? Ans: -Pre-defined packages are available in JDK, whereas user defined packages are created by user as per their requirement.
- Is it possible to declare multiple packages in single source file? Ans: - No, it is not possible to declare multiple packages in single source file.
- What do you mean by import? Ans: - import is a keyword, which is used to import package in a java program.

Technical Tasks: -

tpro India Create a package myutil. In myutil package create a class with the name TestMyUtil. In TestMyUtil class create two methods add() and greatest(). The add() method returns sum of two numbers and greatest() method return greatest no in two nos. Now import myutil package in class TestPackage . Now test the class TestMyUtil. TestMyUtil.java

```
Softpro India | Softpro Indi
                        ro Indial | SoftPro Indial | Soft
package myutil;
                                     Hall Softpro India
public class TestMyUtil
public int add(int x,int y)
return (x+y);
public int greatest(int x,int y)
if(x>y)
return x;
else
return y;
```

Test.java

50

```
import java.util.Scanner;
import myutil.TestMyUtil;
class Test
```



```
SoftPro India
                                             SoftproIndial
public static void main(String [] args)
                                                     oftpro Indial 150f
int x,y;
Scanner sc=new Scanner(System.in);
TestMyUtil tmu=new TestMyUtil();
System.out.println("Enter two numbers");
x=sc.nextInt();
y=sc.nextInt();
System.out.println("Sum="+tmu.add(x,y));
System.out.println("Greatest No="+tmu.greatest(x,y));
```

HPTO Min.

Jial Sout

Create a package mypack. In mypack package create a public class with the name TempConv. In TempConv class create two methods cToF() and fToC(). cToF() method converts the temperature from centigrade to foreignhite. fToC() method converts the temperature from foreignhite to centigrade. Now import mypack package in class TestTempConv. Now test the class TempConv. TempConv.java

```
o India | Softpro India | Softpro In
                  Indial | SoftPro Indial
                  Jial | Softpro
package mypack;
                             dial Softpro Indial
public class TempConv
public double ctof(double c)
double f;
f=(9*c)/5+32;
return f;
public double ftoc(double f)
double c;
c=(f-32)*5/9;
return c;
```

Test.java

al

Soft

cpro maia

```
Indial | Softpro
                              Pro Indial 19
                                                       Softpro India
import java.util.Scanner;
import mypack. TempConv;
class Test
public static void main(String [] args)
double c,f;
```



```
SoftPro India
..print("Enter temperature in c: ");
..c.nextDouble();
f=tc.ctof(c);
System.out.println("Temperature in f="+f);
break;
case 2:
System.out.print("Enter temperature in f="+f);
=sc.nextDouble();
=tc.ftoc(f):
//ster-
int ch;
                                  Softpro Indial Softpro India
                                                      ro Indial Softpro India
 System.out.println("Temperature in c="+c);
 break;
                                                                       dial Soft
 default:
 System.out.println("Invalid choice");
 break;
                                                               tpro Indial Soft
```

Interview Questions: -

- 1. Is it possible to import multiple packages in single source file? **Ans:** - Yes, you can import multiple packages in single source file.
- 2. Is it possible to declare multiple packages in single source file? **Ans:** - No, you can declare one package in single source file.
- 3. What is difference between main package and sub package?
 - Ans: A package defined inside another package is known as sub package. Sub packages are nothing different than packages except that they are defined inside another package. Sub packages are similar as sub directories which is a directory created inside another directory.
- What do you mean by fully qualified name of class?
 - Ans: A fully-qualified class name in Java contains the package that the class originated from. Also, an inner class is a class that is another class member. So, the fully-qualified name of an inner class can be obtained using the getName() method.

ro Indial |Soft



Indial |Softpro India

Jial Softpro In

What is the public modifier?

Ans: - The Java access modifier public means that all code can access the class, field, constructor or method, regardless of where the accessing code is located. The accessing code can be in a different class and different package.

What is the default modifier in Java?

Ans: - Default. When we don't use any keyword explicitly, Java will set a default access to a given class, method or property. The default access modifier is also called package-private, which Idial Softpro India means that all members are visible within the same package but aren't accessible from other packages. Indial 150£

7. What is most restricted modifier in Java?

Ans: - private is most restricted modifier in Java.

What is most accessible modifier in Java?

Ans: - public is most accessible modifier in Java.

Multiple Choice Questions: -

- 1. Which of these keywords is used to define packages in Java?
 - a) pkg
 - b) Pkg
 - c) package
 - d) Package
- Which of these is a mechanism for naming and visibility control of a class and its content?
 - a) Object
 - b) Packages
 - c) Interfaces
 - d) None of the Mentioned
- Etpro Indial Which of these access specifiers can be used for a class so that its members can be accessed by a different class in the different package?
 - a) Public
 - b) Protected
 - c) Private
 - d) No Modifier
- 1 Softpro India Which of the following is the correct way of importing an entire package 'pkg'?
 - a) import pkg.
 - b) Import pkg.
 - c) import pkg.*
 - d) Import pkg.*



			CX	
1. c	2. b	3. a	4. c	5. b

	846,		dia,	C OFF	7	Jon	150	25.	to ji
. (Pottb.	15	10.	150	~0	1.	1/10		CO
1/	J .	toro Ir	110	Soft	ELGI	mang	12/15	P	
10	00	CK	100	15	0,	· O pr		10	170
ndi	5.	Which of the	following packa	age stores all the	standard java o	classes?	dia,	00	LLY
21	Sr,	a) lang	***	gra	, GOIL,	1	Troi	190	
Tion		c) util	O III	\	10	020	4.5	2	(2)
20	112	d) java.packa	iges	dia,	00	ELF.	ind	1.	30,
11	Answ	er Key: -	, , ,	India 3. a	1/2	classes?	CO Tr	al So	
40 r	1.	2c	2. b	3. a	12	4. c	5. b	india	, 0
	o Indi	. (11	4.70		190,	- ~0	3.	1 1.
40	OTT)	200	112		ELPI	- 97	9.
ELG,	Fill i	n the blank	s Questions:	s used to create used to access pa	John	150	17-2	Tille	
) }	<u> </u>	ii iiie diaiik	s Questions.	-40	<i>y</i>	2/ /2	00	to Indiana I	210
(3	COLUI.	Ans: - packaş	keyword i	s used to create	package.	Tor ,	COLLI	1	10.
509	CI	rms packa	, 15	0,	Oliv		10	010	
10	2.	0	keyword is u	ised to access pa	nckage.	dia,	00	177	11
(Step	Ans: - impor	10,	(00),	1	100	1/20	Softpr	0 ,
1/	3.	Package cont		classes	noro	11	97	ELE,	
al 16	3	Ans: - public	12910		FILE	120		50,	
	594.		is a mechan	ism for naming	and visibility co	ontrol of a class	s and its conter	ıt.	16,
120	1	Ans: - Packa	ge	110	ELL	4.4	SQue	(60)	- 3
Ogra	1	20111	Till		150	10)		1/10	10
			Oro	212	(Th.	91	0-	coti
	910	, GOY	CE	TUO	1,50	, ,	Tri	1	0
O III		1/2	200	1	12/	CXO?		dia,	_
	27.5	<i>)</i> ,	St. J.	100	1,1	COLLY	1	10.	1/2
	The	110	5	-10 b		,	word.	2,18	1
200)	112	EK.	6,	Jajia	. GO	ST	1000	
ISK	12	Or	150,		11.	1/20	70	0	1:2
	200	110	7,	CLDI	3	gr,	CELL.	440	970
~ OF	X	Maria	, C	Oras	Tre	1/	20	40 17	
50	A (2 pr		anc.	TO	112	Ç	46,	2
	EKBI		is a mechan	COLLA	1	nor	(150)	y 5 - 8 5 - 7	Tir
C	0,	11	\	12	~10°	4.5	2	Crozi	0
1/ 1/2	CX	0,00	112	0.0	EFF	TOOL		COLLE	
		S	is a mechange	India	ndial ndial	ologies P	Ltd Pag	e 124	120
	1	CHOT	oftpro Ind	12	279	4.4	2930	, COT	-1
AACH		1.1.6	_ (The Control of the Co	(- 1)				



Etpro IIIui

(Collection Framework Part - I)

1. What do you mean by Java Collection? Describe its architecture.

- Java Lecture –

 (Collection Frame)

 Long Answer Questions:
 1. What do you mean by Java Co'

 Ans: Java Collection

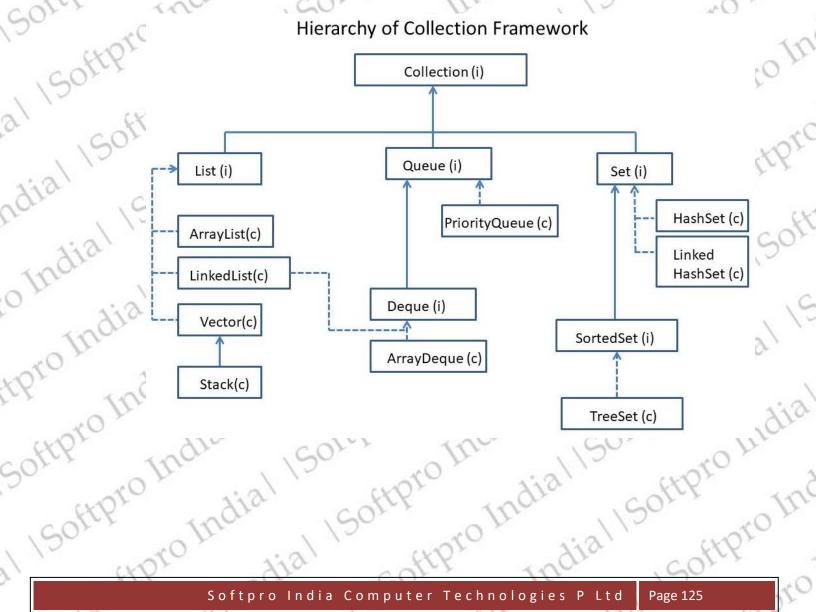
 Collection for the desire interior.

 Collection for the desire interior. tpro Indial Softpr Collection is sometimes called a container. It is an object that groups multiple elements into a single unit.

 Collections are used to store, retrieve. manipular.
 - Softpro

Architecture of Collection: -

Hierarchy of Collection Framework





Softpro Indial 19

Indial Softpro Indial Soft

- What are the prerequisites to learn Java Collection?
 - **Ans:** Prerequisites to learn Java Collection are:
 - 1) AutoBoxing
 - 2) toString() method
 - 3) type-casting
 - 4) interfaces
 - 5) for-each loop
 - 6) implementation classes
 - 7) compareTo() method
 - 8) Wrapper classes
 - 9) Marker interfaces advantages
 - 10) Anonymous inner classes

Short Answer Questions:

What is ArrayList? Write is features.

ArrayList: - ArrayList is implementing List interface. It is widely used class in projects because it is providing functionality and flexibility.

ArrayList Characteristics:

- 1) ArrayList was Introduced in 1.2 version.
- 2) ArrayList stores Heterogeneous objects(different types).
- 4) ArrayList preserved Insertion order. It means in whatever order, we inserted the data, in the same way the output is printed.
- 5) ArrayList methods are non-synchronized methods.
- 6) Duplicate objects are allowed.
- 7) The under laying data structure is growable array.
- 8) By using cursor, we are able to retrieve the data from ArrayList: Iterator, ListIterator
- In how many types, you can iterate collections?

Ans: - We can iterate collections in two ways: -

- By using for each loop
- ii.) By using Iterator
- What is Iterator? How it works?

Ans: - Iterator enables you to cycle through a collection, obtaining or removing elements. ... Each of the collection classes provides an iterator() method that returns an iterator to the start of the collection. By using this iterator object, you can access each element in the collection, one element at a time.



Technical Tasks: -

Softi

to India

1. Develop a program in Java to create an ArrayList of String type. Store five names of your friends into ArrayList. Display the elements of ArrayList using for-each loop.

Athro mini

dial 150m

```
ads");
Softpro India
import java.util.*;
                                    ro Indial Softpro Indial Softpro
class Test
public static void main(String [] args)
ArrayList<String> al=new ArrayList<String>();
al.add("Brijesh");
                                                   ial Softpro India
al.add("Yashi");
al.add("Rohit");
al.add("Rajat");
al.add("Disha");
System.out.println("List of my friends");
for(String n:al)
System.out.println(n);
```

Develop a program in Java to create an ArrayList of String type. Store five names of your friends into ArrayList. Display the elements of ArrayList using iterator.

```
Softpro India | Softpro India | Softpro India |
.ot<String>();

...aud("Rajat");
al.add("Disha");
System.out.println("List of my friends");
Iterator itr=al.iterator();
while(itr.hasNext())
{
System.out.println("the system.
```



3. Develop a program in Java to create an ArrayList of objects of user defined class Student. The Student class has rollno, name and fee. Store Student information in ArrayList and display Student information.

Etpro III.

dial 1501ch

to India

Softi

```
.pro Indial | Softpro Indial | Softpro Indial | Pro Indial | Softpro Indial | Pro I
                                                                      Softpro Indial Softpro Indial
import java.util.*;
class Student
                                                                                                                                                                        Indial Softpro Indial
int rollno;
String name;
double fee;
Student(int rollno,String name,double fee)
                                                                                                                                                       Softpro India
this.rollno=rollno;
this.name=name;
this.fee=fee;
                                                                                                                                                                             Atpro Indial Softpro In
class Test
public static void main(String [] args)
ArrayList<Student> al=new ArrayList<Student>();
                                                                                                                                                                                                                                     Indial Softpro
al.add(new Student(1001,"Brijesh",5000.0));
al.add(new Student(1002, "Yashi", 5000.0));
al.add(new Student(1003,"Rohit",5000.0));
System.out.println("List of students");
for(Student s:al)
System.out.println(s.rollno+"\t"+s.name+"\t"+s.fee);
```

Develop a program in Java to take a LinkedList. Store five employee names in this LinkedList & display the names using Iterator.

```
Indial | Softpro
                                                              SoftproIndia
import java.util.*;
class Test
public static void main(String [] args)
LinkedList<String> al=new LinkedList<String>();
al.add("Brijesh");
al.add("Yashi");
al.add("Rohit");
```



```
Idial SoftPro India
al.add("Disha");
                                                   stpro Indial V
al.add("Priya");
System.out.println("List of Employees");
Iterator itr=al.iterator();
while(itr.hasNext())
System.out.println(itr.next());
```

Etpro IIIn.

5. Develop a program in Java to store five elements in LinkedList and reverse those elements.

```
Indial Softpro India
                                                                                                                                                                                                                                                  Indial Soft
              import java.util.*;
              class Test
                                                                                                                                                                                      Jial Softpro Indial Softpro In
              public static void main(String [] args)
              LinkedList<String> al=new LinkedList<String>();
              al.add("Brijesh");
              al.add("Yashi");
              al.add("Rohit");
             al.add("Disha");
              al.add("Priva");
              Collections.reverse(al);
             System.out.println("List of Employees in reverse order");
Collection frame work classes are present in which package?

Ans: - Collection framework classes are present in java.util package.

What is the root interface of collections?

Ans: - Collection interface is the root interface of the root inte
              Iterator itr=al.iterator();
```

Interview Questions: -

- 1. Collection frame work classes are present in which package?
- 2. What is the root interface of collections?
- Ans: Homogeneous data means similar data types and heterogeneous data means different data



848

iono	Tia, ofth work	90,	11
Color	100, 100,	7)
, 150	io i lia	<u>@D9</u>	
	with the region	SOFTPRO INDIA	
Jan Col	which of these packages contain all the collection classes? a) java.lang b) java.util c) java.net d) java.awt Which of these classes is not a part of Java's collection framework? a) Maps b) Array c) Stack d) Queue Which of these methods deletes all the elements from invoking collection? a) clear() b) reset() c) delete() d) refresh() What is Collection in Java? a) A group of objects b) A group of interfaces c) A group of interfaces	EP?	20
Mult	inle Choice Questions: -	37, 84	R
112000	the choice guestions.	150,	
701 L	Which of these packages contain all the collection classes?	1 1	194.16
11	a) java.lang	719.	1
112	b) java.utii	10,	20.
TWO!	d) java nut	/ /	
JII.	d) Java.awt	710,	
12	d) java.awt Which of these classes is not a part of Java's collection framework? a) Maps b) Array c) Stack d) Queue Which of these methods deletes all the elements from invoking collection? a) clear() b) reset() c) delete() d) refresh() What is Collection in Java? a) A group of objects b) A group of classes c) A group of interfaces d) None of the mentioned Which of these standard collection classes implements a dynamic array? a) AbstractList b) LinkedList c) ArrayList	140	10
300	a) Mans	0 1	1.
2 pr	b) Array	7,19	
200	c) Stack	100	
ELL.	d) Queue	0 1	,
),	1/20 10 11	101	110
3.	Which of these methods deletes all the elements from invoking collection?	17	7.
ELL	a) clear()	10 1	
30,	b) reset()	work	
10	c) delete()	FILE	11
ELL	d) refresh()	0.0	Tr
100,	111, 120	" OTO	ř.
4.	Which of these methods deletes all the elements from invoking collection? a) clear() b) reset() c) delete() d) refresh() What is Collection in Java? a) A group of objects b) A group of classes c) A group of interfaces d) None of the mentioned	TELL	
5, 8	a) A group of objects	dial Soft	
, 40	b) A group of classes	1	05
dial 150	d) None of the mentioned	-, - 56	7
132	d) None of the mentioned	150	
O. 1	Which of these standard collection classes implements a dynamic array?	1 1	
7.	a) AbstractList b) LinkedList c) ArrayList	110'	130
122	b) LinkedList	19	0
COL	c) ArrayList	110	
Jr.	d) AbstractSet	indial 13	
oIndial	Ti Exp. gire	110	10
6.	Which of this class can generate an array which can increase and decrease in size aut	omatically?	10
To Ino.6.	a) ArrayList()	110	5
wit o	b) DynamicList()	Thou	
17	b) DynamicList() c) LinkedList() d) MallocList()	0 1	1
77	a) ArrayList() b) DynamicList() c) LinkedList() d) MallocList()	omatically?	10-
200		7 100	1
EFF 7.	Which of these methods can be used to obtain a static array from an ArrayList object	10 11	
90°	a) Array() b) covertArray()	1010	3
20	b) covertArray() c) toArray()	Still 1	100
ELL	a) Array() b) covertArray() c) toArray() d) covertoArray()	Pro Ind	Mr.
100,	d) covertoArray()	· voice	
110	ore rial exp dra	CHEL	
1/	COLUMN 1900	100	
	Softpro India Computer Technologies P Ltd	Page 130	150



1,50, 11, 12		0>
8. Which of these standard collection classes implements a linked list data structure?	COL	1
 8. Which of these standard collection classes implements a linked list data structure? a) AbstractList b) LinkedList c) HashSet d) AbstractSet 	ial Soft	
b) LinkedList	1 1 -	1000
c) HashSet d) AbstractSet	10,	-6,
d) AbstractSet	Y. C	10,
d) AbstractSet	1 10	7
	Indial la	
 9. Which of these method is used to add an element to the start of a LinkedList object? a) add() b) first() c) AddFirst() d) addFirst() 10. Which of this method is used to change an element in a LinkedList Object? 	- giron	6
b) first()	120	10
c) AddFirst()	,	1
d) addFirst()	710	
d) addFirst()	100	
10. Which of this method is used to change an element in a LinkedList Object?	-O P	,
a) change()	120	30
b) set()	3.00	7.
c) redo()	JI.	
c) redo()	070	
a) change() b) set() c) redo() d) add()	CLO,	
9. Which of these method is used to add an element to the start of a LinkedList object? a) add() b) first() c) AddFirst() d) addFirst() 10. Which of this method is used to change an element in a LinkedList Object? a) change() b) set() c) redo() d) add() Answer Key: -	27.	12
10. Which of this method is used to change an element in a LinkedList Object? a) change() b) set() c) redo() d) add() Answer Key: -	40	7
1 B 6 A	CAO	
2 A 7 C	COLLI	
3 A 8 B	150	.0
4 A 9 D	11	3/
5 C 10 B	GOFF	2
Fill in the blanks Questions: -	150	
Fill in the blanks Questions: - 1 is the root interface for all collection. Ans: - Collection	1 10	2270
Tu in the bunks Questions	(0)	13
1 is the root interface for all collection.	19	0,
Ans: - Collection	110	
Ans: - Collection	dial	
Alia, - Concetion	2 gra	. C
2. ArrayList is a class which extendsclass and implements	Tree '	1-
interface.	India	
Ans: - AbstractList, List	100	
11 10 10 10 10 11 12 12 12 12 12 12 12 12 12 12 12 12	· O ·	-
	7	10
3. Duplicate values are allowed in and both.	1120	
Ans: - ArrayList, LinkedList	0 1	
CO. 111 / 2 40	200	1
20 21 110	427	2
4 method sorts the elements of a collection.	,	Dr.
Ans: - Collections.sort()	200	0.0
10 10 110	EKB .	
il crost tia softh man	CO),	139
Coffee and India Community Tourism Bulling	22 121	40
Softpro India Computer Technologies P Ltd Pa	ige 131	1

Pro India

High 15011

Etpro III.



Java Lecture - 15

(Collection Framework Part - II)

Long Answer Questions: -

1. What is the difference between Iterator and ListIterator?

Ans: - Iterator: - Iterators are used in Collection framework in Java to retrieve elements one by one. It can be applied to any Collection object. By using Iterator, we can perform both read and remove operations. Iterator must be used whenever we want to enumerate elements in all Collection framework implemented interfaces like Set, List, Queue, Deque and also in all implemented classes of Map interface. Iterator is the only cursor available for entire collection framework.

Iterator object can be created by calling iterator() method present in Collection interface.

ListIterator: -It is only applicable for List collection implemented classes like arraylist, linkedlist etc. It provides bi-directional iteration. ListIterator must be used when we want to enumerate elements of List. This cursor has more functionality (methods) than iterator.

ListIterator object can be created by calling listIterator() method present in List interface.

2. What is the difference between HashSet, LinkedHashSet and TreeSet?

HashSet: -

Java HashSet class is used to create a collection that uses a hash table for storage. It inherits the AbstractSet class and implements Set interface.

The important points about Java HashSet class are:

- ➤ HashSet stores the elements by using a mechanism called hashing.
- ➤ HashSet contains unique elements only.
- HashSet allows null value.
- ➤ HashSet class is non-synchronized.
- ➤ HashSet doesn't maintain the insertion order. Here, elements are inserted on the basis of their hashcode.
- ➤ HashSet is the best approach for search operations.

LinkedHashSet: -

LinkedHashSet maintains a linked list of the entries in the set, in the order in which they were inserted. This allows insertion-order iteration over the set.

That is, when cycling through a LinkedHashSet using an iterator, the elements will be returned in the order in which they were inserted.

The hash code is then used as the index at which the data associated with the key is stored. The transformation of the key into its hash code is performed automatically.



TreeSet: -

TreeSet provides an implementation of the Set interface that uses a tree for storage. Objects are stored in a sorted and ascending order.

Access and retrieval times are quite fast, which makes TreeSet an excellent choice when storing large amounts of sorted information that must be found quickly.

Short Answer Questions: -

1. What is the use of ListIterator?

ListIterator: - It is only applicable for List collection implemented classes like arraylist, linkedlist etc. It provides bi-directional iteration. ListIterator must be used when we want to enumerate elements of List. This cursor has more functionality (methods) than iterator. ListIterator object can be created by calling listIterator() method present in List interface.

2. What is HashSet?

HashSet: -

Java HashSet class is used to create a collection that uses a hash table for storage. It inherits the AbstractSet class and implements Set interface.

The important points about Java HashSet class are:

- ➤ HashSet stores the elements by using a mechanism called hashing.
- ➤ HashSet contains unique elements only.
- ➤ HashSet allows null value.
- HashSet class is non synchronized.
- ➤ HashSet doesn't maintain the insertion order. Here, elements are inserted on the basis of their hashcode.
- ➤ HashSet is the best approach for search operations.

3. What is LinkedHashSet? Write its features.

LinkedHashSet: -

LinkedHashSet maintains a linked list of the entries in the set, in the order in which they were inserted. This allows insertion-order iteration over the set.

That is, when cycling through a LinkedHashSet using an iterator, the elements will be returned in the order in which they were inserted.

The hash code is then used as the index at which the data associated with the key is stored. The transformation of the key into its hash code is performed automatically.

4. What is TreeSet?

TreeSet: -



TreeSet provides an implementation of the Set interface that uses a tree for storage. Objects are stored in a sorted and ascending order.

Access and retrieval times are quite fast, which makes TreeSet an excellent choice when storing large amounts of sorted information that must be found quickly.

Technical Tasks: -

Create a LinkedList of Integer type. Store 5 numbers in LinkedList. Now display the LinkedList elements in forward direction and backward direction using ListIterator.

```
Indial |Softpro India
import java.util.*;
                                            ro Indial Softpro India
class Test
public static void main(String [] args)
LinkedList<Integer> al=new LinkedList<Integer>();
                                       Softpro Indial Softpro In
al.add(10);
al.add(20);
al.add(30);
al.add(40);
al.add(50);
                                             Softpro Indial Softpro
ListIterator itr=al.listIterator();
System.out.println("Forward direction traversal");
while(itr.hasNext())
System.out.println(itr.next()):
System.out.println("Backward direction traversal");
while(itr.hasPrevious())
System.out.println(itr.previous());
```

2. Create a program in Java to demonstrate the concept of LinkedHashSet.

```
import java.util.*;
class Test
public static void main(String [] args)
LinkedHashSet<Integer> al=new LinkedHashSet<Integer>();
al.add(10):
```



```
ndial | Softpro Inuia
                          Indial 12011
                               Indial Softpro Inc.
                                       dial Softpro India, 100's
                                             Indial Softpro Indial Softpro
               Iterator itr=al.iterator();
System.out.println("Elements of linked hash set");
while(itr.hasNext())
{
System.out.println(itr.next());
}
stpro Indi
```

ro Indial

al SoftP

o Indial

Softpro

```
TreeSet<String> al=new TreeSet<String>();
al.add("Brijesh");
al.add("Ajay");
l.add("Rohit");
l.add("Rohit");
rator itr=al.iterator();
stem.out.println("Elemerile(itr.hasNext/")
                                                                                                                   ...string>();

Rohit'');
al.add("Disha");
Iterator itr=al.iterator();
System.out.println("Elements of tree set");
while(itr.hasNext())
{
System.out.println(itr.next());
                                                                                      apro Indial Softpro India Softpro India
ndial 150f
ייני();

rintln("Elements of ti

(ir.hasNext())

{
System.out.println(itr.next());
}
}
}
Softpro Indial
```



CYO

CXC	The dia, ofth war con con it
COLU	1000 100
ial Soft	### Action of these classes implements Set interface? a) ArrayList b) HashSet c) LinkedList d) DynamicList 2. Which of this method of HashSet class is used to add elements to its object? a) add() b) Add() c) addFirst() d) insert() 3. What is the unique feature of LinkedHashSet? a) It is not a valid class b) It maintains the insertion order and guarantees uniqueness c) It provides a way to store key values with uniqueness d) The elements in the collection are linked to each other
19.	766 May 2012 May 120
Mı	ultinle Choice Questions: -
112	Control of the contro
1201	1. Which of these classes implements Set interface?
11	a) ArrayList b) HookSat
719	c) LinkedList
100	d) DynamicList
40	d) DynamicList 2. Which of this method of HashSet class is used to add elements to its object? a) add() b) Add() c) addFirst() d) insert() 3. What is the unique feature of LinkedHashSet? a) It is not a valid class b) It maintains the insertion order and guarantees uniqueness c) It provides a way to store key values with uniqueness d) The elements in the collection are linked to each other 4. How to sort elements of ArrayList? a) Collections.sort(listObj); b) Collections.sort(listObj); c) listObj.sort(); d) Sorter.sortAsc(listObj); 5. Which of these return type of hasNext() method of an iterator? a) Integer b) Double c) Pacedors
, 29	2. Which of this method of HashSet class is used to add elements to its object?
Tire	a) add()
200	b) Add()
ELK.	d) insert()
.0	11 10 10 110
CHOTO	3. What is the unique feature of LinkedHashSet?
COLLE	a) It is not a valid class
120	b) It maintains the insertion order and guarantees uniqueness
CK	d) The elements in the collection are linked to each other
al Soft	c of the equipment in the contents in the cont
13	4. How to sort elements of ArrayList?
2	a) Collection.sort(listObj);
190	b) Collections.sort(listObj);
110	c) listUbj.sort(); d) Sorter sort Aso(listObi);
dial 15	d) Softer.softAsc(fistObj),
Cor	b) Collections.sort(listObj); c) listObj.sort(); d) Sorter.sortAsc(listObj); 5. Which of these return type of hasNext() method of an iterator? a) Integer b) Double c) Boolean d) Collections Object
	a) Integer
dia	b) Double
Pur	c) Boolean
0	d) Collections Object
and.	 b) Double c) Boolean d) Collections Object 6. Which of these methods is used to obtain an iterator to the start of collection? a) start() b) begin() c) iteratorSet() d) iterator()
aro Ino	a) start()
4010	b) begin()
The T	a) start() b) begin() c) iteratorSet() d) iterator()
O.	 6. Which of these methods is used to obtain an iterator to the start of collection? a) start() b) begin() c) iteratorSet() d) iterator()
CKOT	7 Which of these methods can be used to move to next element in a collection?
COLLY	c) iteratorSet() d) iterator() 7. Which of these methods can be used to move to next element in a collection? a) next() b) move() c) shuffle() d) hasNext()
	b) move()
626	c) shuffle()
100,	a) next() b) move() c) shuffle() d) hasNext()
110	more rial etter agra cotte
	Softpro India Computer Technologies P Ltd Page 136



- indial | Softpro Inuia 8. Which of these iterators can be used only with List?

 a) Setiterator
 b) ListIterator
 c) Literator
 d) None of the mentions
- 9. Which of this interface declares core method that all collections will have?
 a) set
 b) EventListner
 c) Comparator
 d) Collection

 0. Which of the ro Indial
- 9. Whic a) set b) F

110	40 . 3/ (10) 7/0 2/11
112	8. Which of these iterators can be used only with List?
indialis	8. Which of these iterators can be used only with List? a) Setiterator b) ListIterator c) Literator d) None of the mentioned above 9. Which of this interface declares core method that all collections will have? a) set b) EventListner c) Comparator d) Collection 10. Which of this interface handle sequences? a) Set b) List c) Comparator d) Collection swer Key: -
11.	b) ListIterator
	c) Literator
" OTE	d) None of the mentioned above
Tir	1130
ro Indial	9. Which of this interface declares core method that all collections will have?
0	a) set
Tire	b) EventListner
20	c) Comparator
626	a) Collection
Softpro	d) None of the mentioned above 9. Which of this interface declares core method that all collections will have? a) set b) EventListner c) Comparator d) Collection 10. Which of this interface handle sequences? a) Set b) List c) Comparator d) Collection
070	 10. Which of this interface handle sequences? a) Set b) List c) Comparator d) Collection
ELL	b) List
20,	c) Comparator
10	d) Collection
547	The state was son in
(00)	Title 1/20 TO IT
Ans	swer Key: - Gial Coffp. Andia Softp.
2	the state of the way
al Softs	1 B 6 D
	2 A 7 A
132	3 B 8 B
OUT	4 B 9 D 5 C 10 B
ndia	1
o India Fil	Exp. Tro
Fil	l in the blanks Questions: -
Tire	1 20 112
	1 contain unique values but do not maintain insertion order.
· ad	Ans: - HashSet
1110	110
tpro Indi	4 B 9 D 5 C 10 B Lin the blanks Questions: - 1 contain unique values but do not maintain insertion order. Ans: - HashSet 2 contain unique values and maintain insertion order. Ans: - LinkedHashSet
16	Ans: - LinkedHashSet

Fill in the blanks Ouestions: -

<u>Fui in the bunks Questions: -</u>	
10 .01	110
1 contain unique values but do not maintain insertion order.	- 201 C
Ans: - HashSet	11,
170 190)
2 contain unique values and maintain insertion order.	210
	O.
Ans: - LinkedHashSet	12,
(1) (10)	10
3 contain unique values and maintain ascending order.	01 310
	CF TO
Ans: - TreeSet	17.
2 July 120 120 112	40
4 contain element in key and value pair.	1007
Ans: - HashMap	2/17
This Hashing	10,
2 July 120 120 11	40
190	1001
110 110	414
1) CKO, YIO STORY THOU	(40)
	(A)
Softpro India Computer Technologies P Ltd	Page 137