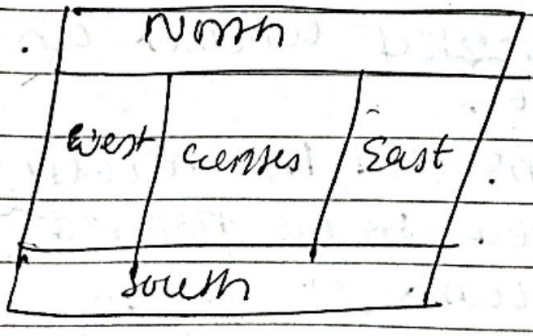
Century
Page: Date:

Q. No. 6. Ans.

1) used in Graphics Programming in Java.
The layout managers are used to arrange component in a particular manner.
It determines size and position of the components within a container.
OR) The process of arranging and sizing GUI components such as buttons, textfields, labels, etc within a container.

Border layout is the default layout manager for windows and Dialog boxes.

Border layout
The border layout is used to arrange the components in five regions: north, south, east, west & center.
Each region may contain one components only.
It is default layout of frame or window.



```
import java.swing.*;
import java.awt.*;
Class Border {
    public Static void main (String [] args)
    {
        JFrame F = new JFrame ("layout");
        F.set layout (new BorderLayout ());
        F.add (b1, "North");
        F.add (b2, "South");
        F.add (b3, "Center");
        F.add (b4, "East");
        F.add (b5, "West");
        F.setSize (200, 100);
        F.setVisible (true);
    }
}
```

Q. No. 7 Ans.

Java finally block is a block used to execute imp. code such as closing the connection, etc.
It is always executed whether an exception is handled or not.
Therefore, it contains all the necessary statement that need to be printed regardless of the exception occurs or not.
The finally block follows the try-catch block.

- finally block is can be used to put "cleanup" code such as closing a file, closing connection.
- imp statement to be printed can be placed in the finally block.

Eg:

```
class Test finally block{
  public static void main(String args[]){
    try{
      int data = 25/8;
      System.out.println(data);
    }
    catch(NullPointerException e){
      System.out.println(e);
    }
    finally{
      System.out.println("Finally block is always executed");
    }
    System.out.println("rest of the code...");
  }
}
```

Q. No. 8 (already done)

Q. No. 9. (not in our syallubus)

Q. NO. 10. Ans.

~~Java~~ multiple ~~interface~~ inheritance is where we inherit the properties and behavior of multiple class to a single class.
In Java, multiple inheritance is not supported because of complexity and ambiguity problem.
Like we can take example where we have two class class 1 and class 2 which have

interfaces.

Same method display(). If multiple inheri-tance is possible then Test class can inherit the data members & methods of both class 1 and class 2 classes. Now Test class have the same ~~display~~ method display(). inherited from class1 & class 2. Problem occurs in method call, now the java compiler cannot decide, which display method it should inherit. To prevent such situation, multiple inheri-tances is not allowed in java.

Eg:

```
class class1{
    public void display(){
        System.out.println("class 1 display method");
    }
}

class class2{
    public void display(){
        System.out.println("class 2 Display");
    }
}

public class extends class1, class2{
    public static void main(String args[]){
        Test obj = new Test();
        // Ambiguity problem in method call
        obj.display()
    }
}
```

Q.No. 12 Ans.

When we need to pass the information from our browser to the web server, from processing the most common method for web processing. It is the common method that helps us to interact with web pages we with the help of JSP. There are two ways through which a browser can send the data to the server:

GET method
It is the default method used to pass information from the browser to the webserver.

POST method
It is used to submit or post data to the server for processing.

1. Creating the form
First, you need to create an HTML form. This form will collect user input and send it to a JSP page for processing.

```
<!DOCTYPE html>
<html>
<head>
    <title> Simple Form </title>
</head>
<body>
    <form action = "Process.form.jsp" method = "post">
    <label for = "name"> Name : </label>
    <input type = "text" id = "name" name = "name">
    <br> <br>
```

<label for="email">Email:</label>
<input type="submit" value="submit">
</form>
</body>
</html>

2. Processing the form data.
Next you need to create JSP page to handle the form submission. This page will retrieve the form data and process it.

<!DOCTYPE html>
<html>
<head>
<title>Form Processing</title>
</head>
<body>
<h2>Form data</h2>
<%
String name = request.getParameter("name");
String name = request.getParameter("email");
%>
Name: <%= name %>
email: <%= email %>

</body>
</html>

Q.NO. 12. ANS.

When multiple threads excess shared resources (eg. variables, data structure, files) concurrency, it can lead to problem like data inconsistency and race condn.
Synchronization is a mechanism that ensures only one thread can access shared resources at a time, preventing conflicts and maintaining data integrity.

Reason why synchronization is imp:

1. Preventing race condn
A race condn occurs when two threads access shared resources simultaneously at a same time.

Eg:

```
class counter {
    private int count=0;

    public synchronized void increment() {
        count++;
    }
    public int getcount() {
        return count;
    }
}
public class SynchronizedMethodExample {
    public static void main(String[] args)
    throws InterruptedException {
        Counter counter = new Counter();
```

```
Runnable task = () -> {
    for (int i = 0; i < 1000; i++) {
        counter.increment();
    }
};

Thread thread1 = new Thread(task);
Thread thread2 = new Thread(task);

thread1.start();
thread2.start();

thread1.join();
thread2.join();

System.out.println("Final count: " + counter.
                    getCount());
    }
}
```

output
Final output : 2000

2. Ensuring Atomicity
3. Maintaining data consistency
4. Avoiding deadlocks
5. Thread safety.

2. Ensuring Automicity.

```
public class Counter {
    public int count = 0;

    public synchronized void increment() {
        count ++;
    }

    Public int get count() {
        return count;
    }
}
```

In Java, you can synchronize methods or blocks of code using the synchronized keyword. When a method or block is synchronized, only one thread can execute it at a time and other threads attempting to access it will be blocked until the lock is released.

Q. NO. 1. Ans.

Exception is an unwanted events, unexpected abnormal situation that is occured at the runtime.

Exception handling is a way of handling the exception during runtime. Exception handling is a powerful method that is used to control the error occured in runtime so that it helps to maintain the flows of apps or program.

1. Try:
The try keyword is use to specify a block where we should place an exception code. It means we cannot use try block along. The try block must be fooct by either catch or final.

eg:

```
try
    int a= 100/0;
}
```

2. Catch
The catch block is used to handle the exception. It must be preced by try-block which means we can't use catch block along.

3. Throw.
The throw keyword is used ~~to~~ ~~throw~~ throw and exception.

4. Throws.
The throws keyword is used to declare excepreons. It speciry that their may occured an exception in the method. It doesnot throw an exception.

Eg:

```
class Test
{
    public static void main(String[] args)
    {
        System.out.println("main method started");
        int a=10, b=0, c;
        try
        {
            c = a/b;
            System.out.println(c);
        }
        catch (Exception e)
        {
            System.out.println(e);
        }
        System.out.println("main method ended");
    }

public class Test throw1
{
    public static void validate(int age)
    {
        if (age<18)
        {
            throw new ArithmeticException("person is
            not eligible to vote");
        }
        else
        {
            System.out.println("Person is eligible
            to vote");
        }
    }
}
```

```
public static void main (String args[])
{
    validate (13);
    System.out.println ("rest of the code ...");
}
}
```

Ch-2
pg-37

Q. No. 2. Ans.

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListner;
import java.awt.event.KeyAdapter;
class Addition Extends JFrame. implements
 ActionListner {
    JLabel l1, l2, l3;
    JTextfield t1, t2, t3;
    JButton b1;
public Addition () {
    l1 = new JLabel ("First number:");
    l1.setBounds (20, 20, 100, 20);
    t1 = new JTextField (20);
    t1.setBounds (120, 20, 100, 20);

    l2 = new JLabel ("Second number:");
    l2.setBounds (20, 40, 100, 20);
    t2 = new JTextField (20);
    t2.setBounds (120, 20, 100, 20);
```

```
l3 = new JLabel ("Result :");
l3 = setBounds (20, 10, 100, 20);
t3 = new JTextField (10);
t3.setBounds (120, 70, 200, 120);

add (l1);
add (t1);
add (l2);
add (t2);
add (l3);
add (t3);

b1 = new JButton ("Sum");
b1.setBounds (70, 70, 80, 20);
add (b1);

b1.addActionListener (this);
setSize (400, 300)
setLayout (null);
setVisible (true);
setDefaultCloseOperation (JFrame.
                EXIT_ON_CLOSE);

@override class keyChecker extends keyAdapter
public void actionPerformed (ActionEvent e)
{
  if (e.getSource () == b1)
  {
    int num1 = Integer.ParseInt (t1.getText());
    int num2 = Integer.ParseInt (t2.getText());
    int sum = num1 + num2;
    t3.setText (String.valueOf (sum));
}
```

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

Q. NO. 3. Ans.

Servlet	JSP
1. It is pure java code	1. It is HTML based complication code.
2. We write HTML in Servlet code.	2. We write JSP code in HTML.
3. Servlet is faster than JSP.	3. Power be it first translate into java code then compile.
4. Longer and more complicated.	4. Shorter and easier to read
5. Servlet can accept all protocol request.	5. It only accept http request.
6. In mvc pattern, servlect acts as controller.	6. In MVC, JSP acts as a view.
7. Modification is Servlet is time consuming bc if incude reloadding, recompeing and restarting the server.	7. Modification is fast bc, just need to click the refresh button.
8. In servlet, default session management is not enabled.	8. session managem -ent is enabled.

```
<!DOCTYPE html>
<html>
<head>
<title> JSP program to display "LOST" 20
times </title>
</head>
<body>
<h1> Displaying "LOST" 20 times!! </h1>
<table>
<%
for (int i=1 ;i<=20; i++){
%>
<tr><td> LOST </td></tr>
<%}%>
</table>
</body>
</html>
```

6.

Group B.

4. Ans.

Class is an blueprint of an instance. They are the collection of the object. With the help of the classes, the object can invoke diff. methods.

We can simply create the class in java by using the following syntax.

```
class class_name
{
    // required code
}
```

For example

```
class Test
{
    void Test_Print()
    {
        System.out.Print("Hello");
    }
}
```

Diff. bet:

class are easily implemented.

The classes are like the portion through which the instance like objects are created. The class include diff. variables, methods etc.

whereas, Interface is used for the case to create the abstract class. The interface includes the abstract methods, fields and variables, etc. The interface is denoted by 'interface' keyword. The 'implements' keyword is used to implement the interface

For eg:

```
class Animal.
{
    void eat()
    {
        System.out.println("eating");
    }
}
class Dog extends Animal
{
    void bark()
    {
        system.out.println("barking");
    }
class Test
{
    public static void main(String[] args)
    {
        Dog d = new Dog();
        d.bark();
        d.eat();
    }
}
```

Interface:

```
class Printable
{
    void print()
    {
        System.out.println("printing");
    }
}

class A6 implements Printable
{
    void print()
    {
        System.out.println("printing in
                A6");
    }
}
public static void main(String[] args)
{
    A6 obj = new A6();
    A6.print();
}
}
```

Q. No. 11. Ans.

Servlet is a tool that is used in web application to communicate betn server and a client. Servlet deals with accepting request of the client and give response after processing the request.

> The request can be to read the file, upload the file, create the file or delet the file.

> The HTTP request (GET) deals with reading the file. And this request can be handled using servelets.

> GET request deals with retrieving the data for which first it is required to make connection with url and execute the get function that sends request to the server to retrieve the data and client can proceed further for other implementation.

while doing so, the available classes & interface like HTTP response (HTTP request, servlet request can be used.

The get function may contain;

```
GET( HttpRequest request (HTTP Response
response ) throw IO Exception
{
    // code
}
```

Century
Page: Date:

Q Throws exception if error occurs. To make connection with URL, URL class can be implemented URL url = new URL ("http://www.ms.com");

By combining all this codes and adding necessary implementation HTTP request (GET) can be handled.

(write eg if possible)]

S. ANS,

```
import java.io.FileReader;
import java.io.IOException;
public class FileReaderDemo {
    public static void main(String[] args){
try{
    FileReader fr = new FileReader("test.txt");
    int c;
        while (c=fr.read() != -1) {
            System.out.println((char)c);
        }
}
catch(IOException ex){
        ex.printStackTrace();
}
}
}
```

Q.NO. 6. Ans.

Gridbag layout is one of the flexible and complex.
In this layout, we can control the shape, size & position of an object layout.
The grid contains of rows & columns in which the value of these rows & columns can be customized in grid bag layout.

The rows control the horizontal orientation of a layout whereas the column controls the vertical orientation of the layout.

Gridbag layout helps to organize the layout in various size as required by the user.
Gridbag layout helps to make graphical user interface more interactive as we can set the layout sizes with multiple grids.

Gridbag layout controls more over the GUI applications.

```
import. java. swing. *;
import. java. awt. *;
class Grid layout {
    JFrame F = new. Frame ("Grid");
    F. set layout (new Grid Bag layout());
    Grid bag constraint G = new Grid bag
                            constraint ();

    G. grid X = 0;
    G. grid y = 0;
    F. add (b1, G);
    F. add (b2, G);
    F. add (b3, G);

    F set size (60, 60).
    F. set visibility (true);
}
public static void main (String[] args);
{
    Grid layout g1 = new Grid layout ();
}
```

Q.No.7 (not in our syllabus)

- Q-No. 8. Ans..

Benefits of using JDBC

1. It is simplified way to run SQL statements and handle exceptions.
2. It's efficient data management.
3. It's secure data management
4. It's platform-independent.

5. Simple syntax so easy to learn
6. Good performance with large data.

Cons

1. Complex
2. Large programming over head
3. No encapsulation

Prepared statement is used to execute parameterized or dynamic SQL queries.
It is designed to improve performance and security when executing repetitive SQL statement.
The performance of the application will be faster if we use prepared statement interface bc query is compiled only once.
To get the instance of prepared statement, the prepareStatement() method of connection interface is used.

pg. 4

Q. no. 9. Ans.

Sol;

~~Server program~~

Steps for writing client program

→ open a socket

↳ opean an input & output stream to the socket

↳ Read from and write to the sockets stream.

↳ close the socket.

Steps for writing server program:

↳ Create the object of server socket class.

↳ Accept the connection from the client.

↳ Get input and output stream of socket

→ Read / write data to the socket.

↳ close stream & socket.

Eg: Client Program

```
import java.net.*;
import java.io.*;
import java.util.*;
public class MsgClient{

    public static void main(String args[])
        throws IOException{
    Socket cs = new Socket("localhost", 1254);
    Scanner ins = new Scanner(cs.getInput
                Stream());
    PrintWriter outs = new PrintWriter
        (cs.getOutputStream(), true);
    outs.println("Hello Server");
    String s = ins.nextLine();
    System.out.println("From Server:"+s);
```

ins.close();
outs.close();
cs.close();
}
}

Example (Server program)

```
import java.net.*;
import java.io.*;
import java.util.*;
class MsgServer1
{
    public static void main(String args[])
    throws IOException
    {
        ServerSocket ss = new ServerSocket(3254);
        Socket cs = ss.accept();

        Scanner ins = new Scanner(cs.getInput
                                  Stream());
        PrintWriter outs = new PrintWriter(cs.get
        OutputStream(), true);

        String s = ins.nextLine();
        System.out.println("From Client :"+s);
        outs.println("Hello Client");

        outs.close();
        ins.close();
        cs.close();
        ss.close();
    }
}
```

Q. No. 10 (not in our syllabus)

Q. No. 12. Ans. (already done)

Q. No. 13.

To create a Java servlet, we need to use servlets API which contains all the necessary interfaces and classes. Servlets are the Java program that runs on the Java enable web server or application server.

The servlets API has two main package. They are:

1. Javax.servlet
2. Javax.servlet.http

1. Javax.servlet

This package contains no. of interfaces and classes to support generic servlet which is protocol independent.

Classes available in Java.servlet package

1. Generic servlet
   To define generic & protocol independent servlet.
2. Servlet context event
   To generate notification about changes to the servlet context of web application.
3. Servlet input stream
   Provides an input stream for reading requests.

4. Servlet output stream
Provides an output stream for writing responses.

5. Servlet Exception
Indicates a servlet error occurred.

Interface	Description
Servlet	Declare life-cycle methods for a servlet.
ServletConfig	Allows servlets to get initialization parameter
Servlet Request	used to read data from a client request
Servlet Response	used to write data ~~from~~ to a client response

Java.*.servlet.http package
This package provides the no. of interfaces and classes to support HTTP servlet which is HTTP protocol dependent.

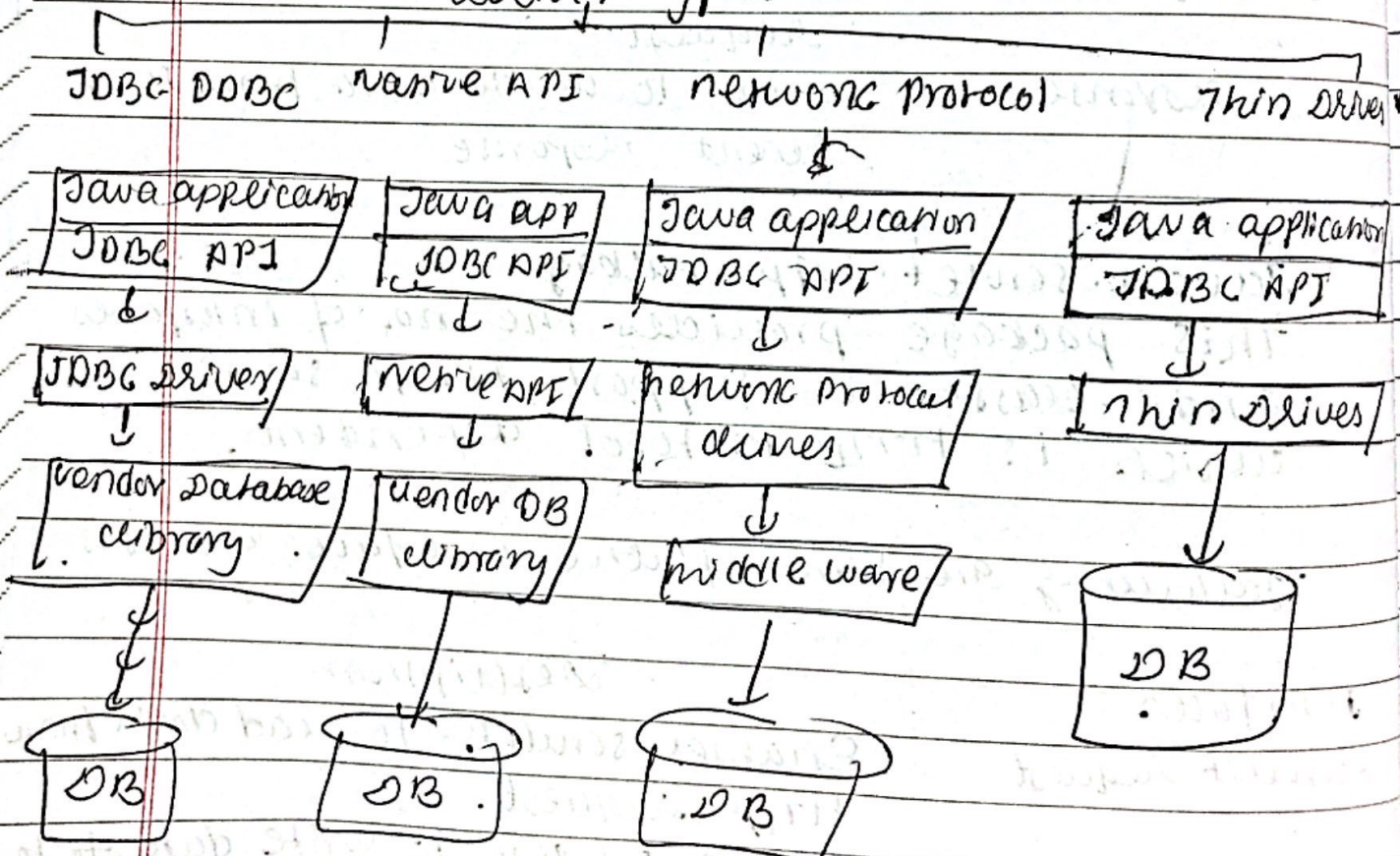
Following are some of the interfaces & classes..

Interfaces	Description
HttpServlet Request	Enables servlets to read data from HTTP request.
HttpServlet Response	Enables servlets to write data to an HTTP response
HttpSession	Allows session data to be read & written.

Class	Description
Cookie	is a small information which is set on web browser as client.
Http servlet	provide method to handle HTTP request and responses.
HTTPSessionEvent	Encapsulation a session-changed event

Q13. a and b (not in syllabus)

Q. No. 23. C. Ans.



JDBC driver is a software component that enables java application to interact with the database. 4 types:

1. JDBC-ODBC bridge driver types
   JDBC-ODBC bridge driver uses ODBC driver to connect to the database.
   - To use type 1 driver in a client machine, an ODBC driver should be installed and configured correctly.
   - This driver does not directly interact with the database. To interact, it needs ODBC driver. It converts JDBC method class into ODBC method class.

Advantage:
   - It can be used to connect to any types of database.
   - easy to use.

2. Native-API driver
   - type 2 drivers are written partially in java and partially in native code.
   - The native-API of each database should be installed in the client system before accessing a particular database.
   - This driver converts JDBC methods calls into native calls of the database API.

ADV: Performance upgraded than JDBC-ODBC.

3. Network Protocol driver

- In type 3 driver, the JDBC driver on the client machine uses the socket to communicate with middle ware at the server.
- The client database access requests are sent through the network to the middle ware.
- Type-3 drivers are fully written in Java, hence they are portable.

Type 4: Pure Java driver

- This driver interact directly with database.
- No client-side or server-side installation.
- It is fully written in Java, hence they are portable drivers.

Q.No. 13. d.

- Java server page is a ~~tool~~ technology that allow you to embeded Java code in the html pages.
- The functionality is very helpful for the Java programers because of the feature of being able to work on the existing HTML page using Java programming languages.
- This supports flexibility in code and will save the time of developers.
- For instance, if we have a webpage with a lot of components and we want to make changes or add certain component in that webpage. The

Century
Page: Date:

- Then, we are not required to write the whole webpage in Java. But can write the necessary changes in Java programming languages, which will get embedded to the web page by JSP despite of the fact being programmed in a diff. programming language.