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Date: 15th Oct, 2022.

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Course Title : Web Engineering.

Course Code : IT-205.

* Grand Assignment Past Papers *

Past Paper 2014, 2017.
Short Q-Ans.

(1) How can you add a page ↑title in HTML ?

The < title > tag defines the title of document.
→ The < title > element :

- defines a title in the browser toolbar.
- provides a title for the page when it is added to favourites.
- displays a title for the page in search-engine results.

< head >
    < title > HTML document < /title >
< /head >.

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(2) What do you mean by external CSS?

An external style sheet is a separate CSS file that can be accessed by creating a link within the head section of the webpage. Multiple webpages can use the same link to access the stylesheet. The link to an external style sheet is placed within the head section of the page.

```
< head >
    < link rel = "stylesheet"  type = "text/css"
         href = "mystyle.css" >
< /head >.
```

(3) What is the purpose of interactive website?

An interactive website is a website that communicates and allows for interaction with users. And by interaction, we don't just mean allowing users to "click" and "scroll". Offering users with content that is amusing, collaborative and engaging is the essential objective and purpose of an interactive website.

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(4) For what purpose cookies are used ?

Cookies are small pieces of text that are sent to your browser by a website you visit. They help that website remember information about your visit, which can both make it easier to visit the site again and make the site more useful to you.

(5) Differentiate between HTML and XML.

The key difference between HTML and XML is that HTML displays data and describes the structure of a webpage whereas XML stores and transfers data. XML is a standard language which can define other computer languages, but HTML is a predefined language with its own implications.

(6) What purpose does HTTP status code serve?

An HTTP status code is a message a website's server sends to the browser to indicate whether or not that request can be fulfilled. Status

code specs are set by W3C. Status codes are embedded in the HTTP header of a page to tell the browser the result of its request.

(7) What happened when you send data from a HTML form with GET method?

. The GET method is the method used by the browser to ask the server to send back a given resource: "Hey server, I want to get this resource". In this case, the browser sends an empty body. Because the body is empty, if a form is sent using this method the data sent to the server is appended to the URL.

(8) For what purpose applications variables are used?

Application variables provides a way to store information in your application, and they're available to all the application's users. For example; you can use Application variable in Visual InterDev to store information about

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data connections. When you add a new data source to the web project, visual InterDev adds the data source definition to your global.asa file. When you create an Application variable, the variable's data exists only once for that application on the Web server. The script requires only a small amount of server's memory to hold the definition for the data source. Application variables are fine for some static information.

(9) What is the purpose of XSLT?

XSLT is used to transform XML documents into XHTML documents, or into other XML documents. XSLT stands for Extensible Stylesheet Language Transformation. It specifies a language definition for XML data transformation.

(10) How do you display a message box in the browser using JavaScript?

One useful function that's native to JavaScript is the alert() function. This

function will display Text in a dialogue box that pops up on the screen. Before this function can work, we must first call the showAlert() function. JavaScript functions are called in response to events.

```
< script >
        function showAlert ()
        {
             alert ("Hello World");
        }
</script>.
```

Long Q-Ans.

(1) What do you mean by 3-Tier application architecture? How it helps us to make web appliaction(s)?

Three-Tier architecture is a well established software application architecture that organizes applications into three logical and physical computing Tiers :

(i) the presentation tier or user interface.

(ii) the application tier where data is processed.

(iii) the data tier where data associated with application is stored and managed.

The chief benefit of three-tier architecture is that because each tier runs on its own infrastructure, each tier can be developed simultaneously by a separate development team, and can be updated or scaled as needed without impacting the other tiers.

• Presentation tier :-

The presentation tier is the user interface and communication layer of the application, where the end user interacts with the application. Its main purpose is to display information to and collect information from the user. This Top-level tier can run on a web browser, as desktop application, or a graphical user interface (GUI), for example. Web presentation tiers are usually developed using HTML, CSS and Javascript. Desktop applications can be written within a variety of languages

depending on the platform.

• Application Tier :-

The application Tier, also known as the logic tier or middle tier, is the heart of the application. In this tier, information collected in the presentation tier is processed - sometimes against other information in the data tier - using business logic, a specific set of business rules. The application tier can also add, delete or modify data in the data tier.

The application tier is typically developed using Python, Java, Perl, PHP or Ruby, and communicates with the data Tier using API calls.

• Data Tier :-

The data tier, sometimes called database tier, data access tier or back-end, is where the information processed by the application is stored and managed. This can be a relational database management system such as PostgreSQL, mySQL, MariaDB, Oracle, DB2, Informix or Microsoft SQL Server, or in a NoSQL Database server such as Cassandra, CouchDB or MongoDB.
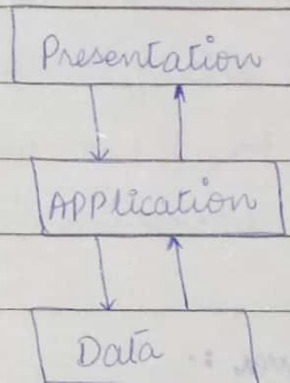
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In a three - tier application, all communication goes through the application tier. The presentation tier and the data tier cannot communicate directly with one another.

```
┌──────────────┐
│ Presentation │
└──────────────┘
      ↓↑
┌──────────────┐
│ Application  │
└──────────────┘
      ↓↑
┌──────────────┐
│    Data      │
└──────────────┘
```

* Benefits :

- Faster development.
- Improved scalability.
- Improved reliability.
- Improved security.

* 3-tier application in web development.

In web development, the tiers have different names but perform similar functions :

- Web Server.
- Application Server.
- DataBase Server.

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• Web Server :-

The Web Server is the presentation tier and provides the user interface. This is usually a web page or a website, such as an ecommerce site where the user adds products to the shopping cart, adds payment details or creates an accounts. The content can be static or dynamic, and is usually developed using HTML, CSS and JavaScript.

• Application Server :-

The Application server corresponds to the middle tier, housing the business logic used to process user inputs. To continue the ecommerce example, this is the tier that queries the inventory database to return product availability, or adds details to a customer's profile. This layer often developed using Python, Ruby, or PHP and runs a framework such as Django, Rails, Symphony or ASP.NET, for example.

• Database Server :-

The database server is the data or backend tier of a web application. It runs on DBMS such as MySQL, Oracle, DB2, PostgreSQL etc.

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(2) What do you mean by JSP? Explain its page life cycle by giving the name and purpose of each function that is called in it.

JSP stands for Java Server Pages. It is a server-side technology. It is used for creating web applications. It is also used to create dynamic web content.

→ The key to understand the low-level functionality of JSP is to understand the simple life cycle they follow.

JSP life cycle :-

A JSP life cycle is defined as the process from its creation till the destruction.
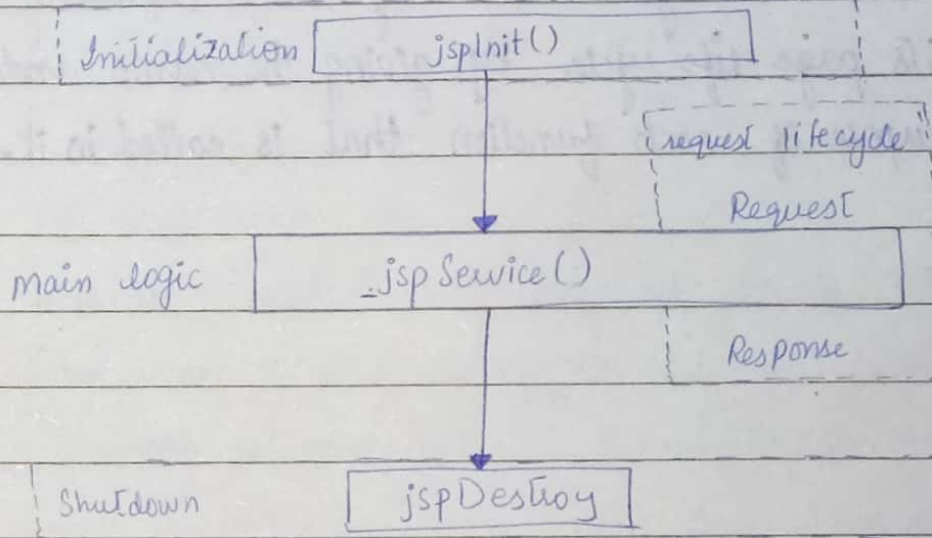
→ **Paths followed by JSP :-**

The following are the paths followed by a JSP :-

- Compilation.
- Initialization.
- Execution.
- Cleanup.

→ The four phases have been described below.

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Initialization	jspInit()	

request lifecycle

Request

| main logic | _jsp Service() | |

Response

| Shutdown | jspDestroy | |

• JSP Compilation :-

When a browser asks for a JSP, the JSP engine first checks to see whether it needs to compile the page. If the page has never been compiled, or if the JSP has been modified since it was last compiled, the JSP engine compiles the page.

→ The compilation process involves 3 steps:
  • Parsing the JSP.
  • Turning JSP into a servlet.
  • Compiling the servlet.

• JSP Initialization :-

When a container loads a JSP, it invokes the jspInit() method before servicing any requests. If you need to perform JSP -

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specific initialization, override the jspInit().
method.

public void - jspInit()
{

    // initialization code.

}

Typically, initialization is performed only once and as with the servlet init method, you generally initialize database connections open files and create lookup tables in the jspInit() method.

• **JSP Execution :-**

This phase of the JSP life cycle represents all interactions with requests until the JSP is destroyed.

Whenever a browser requests a JSP and the page has been loaded and initialized, the JSP engine invokes the _jspService() method in the JSP.

The jspService() method takes an HttpServletRequest and an HttpServletResponse as its parameters as follows:

void _jspService(HttpServletRequest request, ~~HTTP~~
HttpServletResponse response)

```
        }
            // Service handling code.
        }
```

The jspService() method of a jsp is invoked on request basis. This is responsible for generating the response for that request and this method is also responsible for generating responses to all seven of the HTTP methods, i.e., GET, POST, DELETE etc.

• JSP Cleanup :

The destruction phase of the JSP life cycle represents when a JSP is being removed from use by a container.

The jspDestroy() method is the JSP equivalent of the destroy method for servlets. Override jspDestroy when you need to perform any cleanup, such as releasing database connections or closing open files.

```
public void jspDestroy()
{
    // Your cleanup code goes here.
}
```

(3) What do you mean by JavaBeans? What advantages are provided by this technology in the website development over the existing ones?

A JavaBean is a reuseable, platform-independent component that can be manipulated visually in a builder tool. In computing, JavaBeans are classes that have the capabilities of encapsulating several objects or beans into one object or bean.

• JavaBeans provide default constructor without any conditions or arguments.

• JavaBeans are serializeable and are capable of implementing the Serializeable interface.

• JavaBeans usually have several 'getter' and 'setter' methods.

• **Advantages of JavaBeans :**

Mentioned below are few advantages of JavaBeans :

(i) **Easy and Compact :-**

One of the biggest advantages of JavaBeans is that they are very easy

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to create and use. There is no complexity involved. This advantage is what the JavaBean architecture especially focuses on. JavaBeans are lightweight too. This means they don't carry unwanted baggage for supporting their environment.

(ii) Portable :-

JavaBeans can be easily ported to any platform that is compatible with the Java run-time environment. Java Virtual Machine is responsible for implementing both JavaBeans support as well as platform specifications.

(iii) Comes with the strength of Java :-

JavaBeans is easy and universally compatible. It doesn't need a complex mechanism to register components with the Java run-time system.

A few other advantages include its reusability in different environments, usefullness in the creation of applications, applets, servlets, and other components, ease of deployment in network systems, and dynamism and customization.