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Date: 16th Oct, 2022.

Past Paper 2015.

Short Q-Ans.

(1) How can you create a comment in HTML ?

In HTML, a comment is text enclosed within <!-- --> tags. This syntax tells the browser that they are comments and should not be rendered on the front end.

<!-- This is a comment. -->.

(2) What do you mean by internal CSS?

An internal CSS is used to define a style for a single HTML page. An internal CSS is defined in the <head> section of an HTML page, within a <style> element.

```
<head>
    <style>
        body {background-color : blue;}
        h1 { color : red; }
        p1 { color : orange; }
    </style>
</head>.
```

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(3) Differentiate between a static website and a dynamic website.

Static website	Dynamic website.
• Content on a static website is stable and doesn't change.	• Content on a dynamic website can change according to user's req.
• Content on a static website is stored directly on the server and pulled as is.	• Content on a dynamic website is stored in a database and delivered according to how it organized.
• Content changes on a static website need to be made page by page.	• On a dynamic website, they can be made across 100s of pages automatically.
• Static websites can be created fast but as they grow 'll require more intensive content management.	• Dynamic websites may take longer to initially setup but long term they can be more efficient to manage.

(4) Differentiate between stateless and statefull protocols.

Stateless protocols	Statefull protocol.
• Stateless Protocol does not require the server to retain the server	• Statefull Protocol require server to save the status and session

information or session details.	information.
○ There is no tight dependency between server and client.	○ There is a tight dependency between server and client.
○ The stateless Protocol design simplify the server design.	○ The Stateful protocol design make the design of server very complex and heavy.
○ Stateless protocols handle the transaction very fastly.	○ Stateful protocols handle the transaction very slowly.
○ Examples of Stateless are UDP, DNS, HTTP etc.	○ Examples of Stateful are FTTP, Telnet etc.

(5) Differentiate between 2-tier and 3-tier web architecture.

2-tier architecture	3-tier architecture
○ It is a client-server architecture.	○ It is a web-based application.
○ Two-tier architecture consists of two layers: Client tier and Database (Data tier).	○ Three-tier architecture consists of three layers: Client layer, Business layer and Data layer.
○ The application logic is either buried	○ The application logic or process resides in

inside the user interface on the client or within the database on the server (or both).	the middle-tier or application tier and is separated from the data and user interface.
◦ It is easy to build and maintain.	◦ It is complex to build and maintain.
◦ Two-tier architecture runs slower.	◦ Three-tier architecture runs faster.
◦ Examples - Contact Management System using MS-Access or Railway Reservation System etc.	◦ Example - Designing registration form which contains text box, label button or a large website on the Internet, etc.

(6) What protocol is used to access web pages?

Whenever you visit a page on the web, your computer uses the HyperText Transfer Protocol (HTTP) to download that page from another computer somewhere on the Internet.

(7) What do you mean by query string, what kind of data can be sent in it?

A querystring is a set of characters input to a computer or web browser and sent to a

query program to recover specific information from a database. It sends requests to web server. These requests are used to pass information (parameters) from one page to another and you can access those information in receiving page. It containing in the HTTP requests for a specific URL.

(B) For what purpose session variables are used?

Session variables are special variables that exist only while the user's session with your application is active. Session variables are specific to each visitor to your site. They are used to store user-specific information that needs to be accessed by multiple pages in a web application.

(a) Differentiate between servlet and JSP.

Servlet	JSP
○ Servlet is a java code.	○ JSP is a HTML based code.
○ Writing code for servlet is harder than JSP as it is HTML in Java.	○ Writing code for JSP is easy as it is Java in HTML.
○ Servlet plays a controller role in the MVC approach.	○ JSP is view in MVC approach for showing output.

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○ Servlet can accept all protocols request.	○ JSP can only accept HTTP requests.
○ In Servlet, we can override the service() method.	○ In JSP, we cannot override the service() method.
○ It does not have inbuilt implicit objects.	○ In JSP, there are inbuilt implicit objects.

(10) How do you put a message in the browser's status bar using Javascript?

JavaScript can be used to display messages in the status bar using window.status. For example, you can display a javascript status bar message whenever your users hover over your hyperlinks.

```
<a href ="/javascript/javascript_status_bar_
    messages.cfm"
onMouseover ="JavaScript: window.status = 'Status
    Bar Message goes here'; return true"
onMouseOut = "JavaScript: window.status = ' ';
    return true" > Hover over me! </a>.
```

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Long Q-Ans.

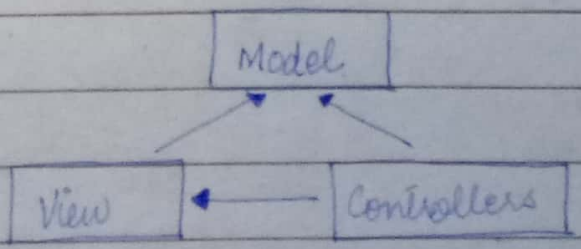
(1) What is MVC? Explain the purpose of each component with the help of examples.

MVC stands for Model - View - Controller. The MVC is an architectural pattern that separates an application into three main logical components:

(i) The Model.
(ii) The View.
(iii) The Controller.

Each of these components are built to handle specific development aspects of an application. MVC is one of the most frequently used industry-standard web development framework to create scalable and extensible projects.

MVC Components.



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- **Model:**

The Model component corresponds to all the data-related logic that the user works with. This can represent either the data that is being transferred between the View and Controller components or any other business logic-related data.

For example: a Customer object will retrieve the customer information from the database, manipulate it and update it data back to the database or use it to render data.

- **View:**

The View component is used for all the UI logic of the application.

For example: the Customer view will include all the UI components such as text boxes, dropdowns, etc that the final user interacts with.

- **Controller:**

Controllers act as an interface between Model and View components to process all the business logic and incoming requests, manipulate data using the Model component and interact

with the views to render the final output.

For example: the customer controller will handle all the interactions and inputs from the Customer View and update the database using the Customer Model. The same controller will be used to view the Customer data.

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

A servlet is a Java programming language class that is used to extend the capabilities of servers that host applications accessed by means of a request-response programming model. Although servlets can respond to any type of request, they are commonly used to extend the applications hosted by web servers.

Servlet Life Cycle:-

A servlet life cycle can be defined as the entire process from its creation till the destruction. The following are the paths followed by a servlet:

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- The servlet is initialized by calling the init() method.
- The servlet calls service() method to process a client's request.
- The servlet is terminated by calling the destroy() method.
- Finally, servlet is garbage collected by the garbage collector of the JVM.

→Now, let us discuss life-cycle in detail:

• The init() Method:

The init() method is called only once. It is called only when the servlet is created, and not called for any user requests afterwards. So, it is used for one-time initializations, just as with the init method of applets.

The servlet is normally created when a user first invokes a URL corresponding to the servlet, but you can also specify that the servlet be loaded when the server is first started.

When a user invokes a servlet, a single instance of each servlet gets created, with each user request resulting in a new thread that is handed off to doGet or doPost as appropriate. The init() method simply creates

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or loads some data that will be used throughout the life of the servlet.

→ The init() method definition looks like this:

```
public void init() throws ServletException
{
    // Initialization code...
}
```

• The Service() Method :-

The service() method is the main method to perform the actual task. The servlet container (i.e., web server) calls the service() method to handle requests coming from the client (browsers) and to write the formatted response back to the client.

Each time the server receives a request for a servlet, the server spawns a new thread and calls service. The service() method checks the HTTP request type (GET, POST, PUT, DELETE etc) and calls doGet, doPost, doPut, doDelete, etc methods as appropriate.

→ Here is the signature of this method:

```
public void service(ServletRequest request, ServletResponse
    response) throws ServletException, IOException {
}
```

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The service() method is called by the container and service method invokes doGET, doPost, doPut, doDelete etc methods as appropriate. So you've nothing to do with service() method but you override either doGet() or doPost() depending on what type of request you receive from the client.

The doGet() and doPost() are most frequently used methods within each servlet request. Here is the signature of these two methods :

→ doGet() method :-

A GET request results from a normal request for a URL or from an HTML form that has no method specified and it should be handled by doGet() method.

```
public void doGet (HttpServletRequest request,
        HttpServletResponse response) throws
        ServletException, IOException {
        // Servlet code.
}
```

→ doPost() method :-

A POST request results from an HTML form that specifically lists POST as the method

and it should be handled by doPost() method.

```
public void doPost (HttpServletRequest request,
        HttpServletResponse response) throws
        ServletException , IOException {
        // Servlet code.
}
```

- **The Destroy() method :-**

The Destroy() method is called only once at the end of the life cycle of a servlet. This method gives your servlet a chance to close database connections, halt background threads, write cookie lists or hit counts to disk, and perform other such cleanup activities.

After the destroy method is called, the servlet object is marked for garbage collection. The destroy() method definition looks like this :

```
public void destroy()
{
    // Finalization code...
}.
```

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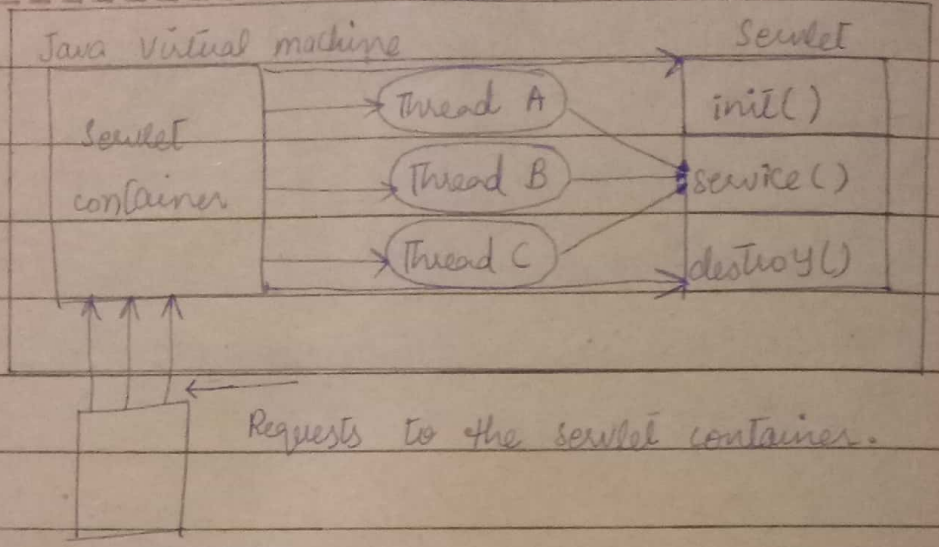

(3) What do you mean by AJAX? What advantages are provided by the AJAX technology in the website development over the existing ones?

Asynchronous JavaScript and XML (AJAX) refers to a group of technologies that are used to develop web applications.

AJAX is made up of the following technologies:

- XHTML and CSS for presenting information.
- Document object model (DOM) for dynamically interacting with and displaying the presented information.
- XML, XSLT and HTML for data interchange and manipulation.

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- XML HttpRequest object to manipulate data asynchronously with the web server.
- JavaScript for binding data requests and information display.

Advantages of AJAX.

• Reduce server traffic and increase speed :-

The first and foremost advantage of AJAX is its ability to improve the performance and usability of web applications. AJAX techniques allow applications to render without data, which reduces the server traffic inside requests. That being said, web developers can lower the time consumption on both side's responses significantly. As a result, your web's visitor will never have to see a white window and wait for pages to refresh with AJAX implementation.

• Enable asynchronous calls :-

AJAX benefits web developers in how its framework can be used for lazy loading. Lazy loading is an optimization technique that's widely used for online content. Ajax allows its users to make asynchronous calls to the web server without reloading the whole webpage. Ajax lazy loading has a positive impact on user experience and rates.

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• XML HttpRequest :-

XMLHttpRequest is a request type widely used for sending a request to Ajax pages. XML HttpRequest transfers and manipulates the XML data to and from a web service using Http. Its purpose is to establish an independent connection between the webpage's client-side and server.

• Reduce bandwidth usage :-

One more advantage of AJAX comes from the bandwidth usage. This action is effective in improving web performance and load speed as well. Ajax makes the best use of the server's bandwidth by fetching partiele contents instead of transmitting the entire page's content. This means that you can bring data from the ~~db~~ database and store it into the database to perform background without reloading the page.

• Form Validation :-

In contrast to traditional form submissions where client-side validations occur after submission, the AJAX method enables precise and immediate form validation. AJAX provides speed, which is also one of its significant benefits.