

Question 1. What are the underlying technologies that make internetworking work successfully? Explain each one briefly . (10 points)

- Packet Switching
- Routers
- TCP/IP
- Clients + Servers = Distributed Computing
- Computer Names.

Question 2. What are the purposes of DNS servers ? How do they work? (10 points)

- Maps domain names into IP addresses
- Receives requests from other DNS servers to map domain names into IP addresses.
- When a mapping request is received DNS server has the following options:
 - It has the info therefore does the mapping and supplies the answer.
 - It does not have the info in which case it contacts another DNS server called alternate DNS server.
- If there is no mapping possible it simply returns error message.

Question 3. What is a web server? Give 2 examples and explain their advantages and disadvantages? (10 points)

- Web servers are the **computers that actually run websites.**
- A computer program that is **responsible for accepting HTTP requests from web clients**, which are known as web browsers, and serving them HTTP responses along with optional data contents, which usually are web pages such as HTML documents and linked objects (images, etc.).

Internet Information Server/Services (IIS)

- Internet Information Server (IIS) is:
 - World Wide Web server.
 - Gopher server.

- FTP server.
- SMTP.
- Windows Vista and Windows Server 2008 has IIS 7.0
- Windows XP has a restricted version of IIS 5.1 that supports only 10 simultaneous connections and a single web site.

Web Server-IIS Advantages

- It has a GUI interface, which makes the installation a bit easier.
- Works well with other Microsoft applications.
- Performance Monitor feature is very useful.
- Good Tech Support.

Web Server-IIS Disadvantages

- It only works with the Windows OS.
- It is not flexible web server, due to Microsoft constraints.
- Source code is proprietary.

Web Server-Apache

- Apache is developed and maintained by an open community of developers under the auspices of the Apache Software Foundation.
- The first version of Apache, was developed in 1995.
- The original version of Apache was written for UNIX, but there are now versions that run under OS/2, Windows and other platforms.

Some features of Apache are:

- Virtual Hosts
- Customized responses to errors and problems
- Allows you to easily set up password-protected pages

Web Server-Apache Advantages

- Industry standard for most web servers.
- Open source.
- Allows remote administration.
- Multi-platform.

The software is free

Web Server-Apache Disadvantages

- Console mode installation.
- No real tech support, except for message boards and third party vendors.
- Apache is not regularly updated.
- Requires more technical knowledge to install and configure.

Question 4. What is a Virtual Host? And what are the advantages of using it ? Explain its methods in details? (10 points)

- servers such as web servers use to host more than one domain name on the same computer, sometimes on the same IP address.
- Its main advantage is: cost-effectiveness because you won't have to pay for a dedicated server to host just your website.
- Virtual web hosting is a good solution for small- to medium-sized websites that aren't constantly being visited or that have reasonable bandwidth needs.
- In simple terms, the virtual hosting company's server will allocate out hosting services and bandwidth to more than one website.
- Two methods:
 - Name based
 - IP based

Name-based virtual hosts use multiple host names for the same web server IP address.

Virtual Host-Name based

How it works?

- The browser sends the URL to the server.
- The server can use this information to determine which web site, as well as page, to show the user.
- For example: www.site1.com and www.site2.com, both resolve to the same IP address.
- For www.site1.com, the server would send the HTML file from the directory /var/www/user/abc/site/, while requests for www.site2.com would make the server serve pages from /var/www/user/xyz/site/.
- Fails when site is accessed through IP.
- Can not work in secure environment.

Virtual Host-IP Based

- In IP-based virtual hosting each site points to a unique IP address.

- The client is not involved in this process.
- It can serve only a certain maximum number of requests per second depending on:
- the HTTP request type,
- whether the content is static or dynamic,
- whether the content is cached,
- hardware and software limitations of the OS of the computer on which the web server runs.
- When a web server is near to or over its limits, it becomes unresponsive.

Question 5. What is the Structure of an HTML File ? (5 points)

```
<html>
<head>
<!-- This section is for the title and technical info of the page-->
<title>
</title>
</head>
<body>
<!-- comments -->
<!-- This section is for all that you want to show on the page -->
</body>
</html>
```

- The **head section** of the web page includes all the stuff that does not show directly on the resulting page.

Question 6. Explain the purpose of each of the following tags for HTML Text format? (5 points)

HTML Text Formatting	
These are the tags for text formats:	
text	writes text as bold
<i>text</i>	writes text in italics
<u>text</u>	writes underlined text
<sub>text</sub>	lowers text and makes it smaller

<code><sup>text</sup></code>	lifts text and makes it smaller
<code><strike>text</strike></code>	strikes a line through the text
<code><pre>text</pre></code>	writes text exactly as it is,including spaces.
<code>text</code>	usually makes text italic
<code>text</code>	usually makes text bold
<code><h1>text</h1></code>	writes text in biggest heading
<code><h6>text</h6></code>	writes text in smallest heading
<code><p>text</p></code>	Adds a paragraph break after the text. (2 line breaks).
<code><hr></code>	Horizontal rule (hr) tag places a straight line across the page.
<code><p align="left">text</p></code>	Left justify text in paragraph.
<code><p align="center">text</p></code>	Center text in paragraph.
<code><p align="right">text</p></code>	Right justify text in paragraph.
<code>
</code>	Adds a single line break

Question 7.What is a plug-in and what is a helper application? (5 points)

- A plug-in is a code module that the browser fetches from a special directory on the disk and installs as an extension to itself.
- A plug-in runs as an integral part of the browser (i.e. in the same process).
- Plug-ins has access to, and may modify the appearance of the current page (eg. run a video sequence within the browser window).
- A plug-in is removed from the browser's memory upon leaving the page from where it is referenced.
- The interaction between the plug-in and the browser is through a browser-specific procedures interface.

Helper Applications

- A standalone application run as a separate process.
- The only interaction between the browser and the application is at invocation time (command line arguments, eg. a file path) and upon termination of the application.

Examples:

- Adobe Acrobat Reader (could be a plug-in too ??)
- Microsoft Word

Question 8. What to do if too many requests come to the CPU? (5 points)

Problem : no single cache

Solutions:

1)Let Front End keep all requests

2) Use a shared memory multiprocessor

Question 9. What are Cookies ? How do they work for client and server? (10 points)

- A cookie is a **small piece of information** as a file (up to 4K) stored on the **client machine** in a user-specific cookies-directory
- Cookies are good for keeping track of return visitors
- Cookies are generated at the server side and is delivered to the browser before the Web page

Client side:

- When the user specifies a URL, the browser searches it's cookie directory for a cookie with the domain name specified in the URL.
- If a cookie for the actual domain exists, it is uploaded to the server with the page request.

Server side:

- The first time a Web page is requested no cookie follows the request so **the server creates a cookie and returns it** before the requested page.
- For later visits to the same page, the request will contain the cookie generated at the previous visit.
- The server updates the cookie and returns it with the page
- This way the server "remembers" the client from one visit to the next.

Question 10. Write an HTML code to create a webpage that has the following features (30 points):

- 1- Title of the webpage "**CSC457 Internet Technology**"
- 2- Background color is yellow, center alignment, and font size 24pt using **class attribute and CSS external file**.
- 3- Write "This is a red centered paragraph" in the webpage.

CSS file : test1.css

```
body{ background-color: yellow}
```

```
p.red {font-size: 24pt; color: red}  
p.center {text-align: center;}
```

Html File :

```
<html>
```

```
<head>
```

```
<title> CSC457 Internet Technology </title>
<link rel="stylesheet" type="text/css" href="test1.css" />

</head>
<body>

<p class="red center"> This is a red centered paragraph. </p>

</body>
</html>
```