**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 is 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: |
| **<b>text</b>** 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 saller |
| **<sup>text</sup>** lifts text and makes it smaller |
| **<strike>text</strike>** strikes a line through the text |
| **<pre>text</pre>** writes text exactly as it is,including spaces. |
| **<em>text</em>** usually makes text italic |
| **<strong>text<strong>** usually makes text bold |
| **<h1>text</h1>** writes text in biggest heading |
| **<h6>text</h6>** writes text in smallest heading |
| **<p>text</p>** Adds a paragraph break after the text. (2 line breaks). |
| **<hr>** Horizontal rule (hr) tag places a straight line across the page. |
| **<p align="left">text</p>** Left justify text in paragraph. |
| **<p align="center">text</p>** Center text in paragraph. |
| **<p align="right">text</p>** Right justify text in paragraph. |
| **<br>**  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> الانترنتCSC457 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>