**Worksheet 4**

1. What transport layer protocol is used to support HTTP, FTP, SMTP, and POP3? Why?

TCP

All of these need to support reliable data transfer.

2. Describe how Web caching can reduce the delay in receiving a requested object. Will Web Caching reduce the delay for all objects requested by a user or for only some of the objects? Why?

Reduces the delay for some objects. Only objects that were previously requested will be reduced in delay. New objects will not have a reduced delay.

Cached items are immediately available to users so their query will not cause more traffic on servers. This reduces the total traffic on the server therefore new object queries will arrive faster than without web caching.

3. Institutional cache hit rate: 0.3, the response time for a hit request is 10 milliseconds; the response time for a miss request is 1 second. What is the average response time for a request?

Request avg response time =

Request avg response time = 0.3 \* 0.01sec + (1\*0.3)x1sec = 0.703sec

4. Alice using a Web-based email account sends a message to Bob who access his mail from a mail server using POP3. Describe how the message gets from Alice’s host to Bob’s host. Indicate application-layer protocol in each step.

Step1: HTTP - alice uses web based email

Step2: SMTP -alice sends a message to bob’s email server

Step3 : POP3 - bob accesses his email server. Bob transfers message from host server to his client.

5. What is the main purpose of DNS? Is DNS centralized? Will a root DNS be accessed for each hostname-to-IP translation? Why?

Purpose: Translate host names

Not centralized

A root DNS is not accessed for each hostname-to-IP translation. The query will be directed to the cache at the local DNS.