CSE421: Computer Networking (Set A)

Quiz: 02 **Total Marks: 15**

Summer 2025 **Time: 15 minutes**

Name:	**ID:**	**Sec:**

Write all your answers in this paper only.

Q1: A client requests to visit the website xyz.com on the **11th November 2024** at **12:20:45**. To get the IP address of the website, the local DNS server replied to the client's DNS request with (**xyz.com, 101.5.30.7, A, 2)**, where TTL is given in **days**. The local DNS server used **iterative DNS** lookup, with an **RTT of 50 ms** each, to retrieve the IP address for the client. Next, on the **14th of November at 10:20:45**, the client visited the same website.

a) **Calculate** the **total RTT** for **the client** to fetch the IP address on **14th of November**. **[4]**

Here, as the TTL expires, local DNS server needs to retrieve the IP address again.
Using iterative lookup, it will take 3 RTT (Root, TLD and Authoritative).
So, **total RTT for the Local DNS server** = 3 * 50 ms = 150 ms.
In the question, total RTT for the client has been asked. But the RTT value from client to local DNS server has not mentioned here, hence, assuming the RTT from client to local DNS server is 0ms.
So, **total RTT for the client** = 150 ms.

Note: If anyone considers the RTT from the client to the local DNS server as 50ms; I will consider it.

After fetching the IP address, **the client** sends the request to the website server to open a **persistent HTTP connection**. The website has a total of **20 objects** each requiring **120ms** to be downloaded. The TCP Request needs **80ms** to be sent from the client to the server and come back. The client waits **45ms** before sending every HTTP request for every object. Next, it takes **110ms t**o send the HTTP request and the server requires **70ms** to send each object.

b) **Calculate** the **total RTT** required to fetch all the objects after retrieving the IP address. **[4]**

Persistent connection:
Total RTT = 1 RTT for TCP + No. of objects * RTT for HTTP request-Response
= 80 ms + 20 * (110 ms + 70 ms)
= 3680 ms or 3.68 sec.

c) **Calculate** the **total time** the client takes to load the webpage. **[4]**

Total loading time = Total RTT + Total waiting time in client side +
File transmission time for all objects
= 3680 ms + 20 * 45 ms + 20 * 120 ms
= 6980 ms or 6.98 sec.

Q2: Compare between IMAP and POP3 (at least 3 points)? **[3]**

See the slide.

CSE421: Computer Networking (Set B)

Quiz: 02 **Total Marks: 15**

Summer 2025 **Time: 15 minutes**

Name:	**ID:**	**Sec:**

Write all your answers in this paper only.

Q1: A client requests to visit the website abc.com on the **10th August 2024** at **23:20:15**. To get the IP address of the website, the local DNS server replied to the client's DNS request with (**abc.com, 121.4.30.3, A, 36)**, where TTL is given in **hours**. The local DNS server used **recursive DNS** lookup, with an **RTT of 65 ms** each, to retrieve the IP address for the client. Next, on the **12th of August at 06:20:45**, the client visited the same website.

a) **Calculate** the **total RTT** for **the client** to fetch the IP address on **12th of August**. **[4]**

Answer: Here, the TTL didn't expire in the local DNS server. Therefore, the client only needs to bring the IP address from the local DNS server. But the RTT value from client to local DNS server has not mentioned here, hence, assuming the RTT from client to local DNS server is very negligible.

So, **total RTT for the client** = 0 ms.

Note: If anyone considers the RTT from the client to the local DNS server as 65 ms; I will consider it.

After fetching the IP address, **the client** sends the request to the website server to open a **non-persistent HTTP connection**. The website has a total of **55 objects** each requiring **75ms** to be downloaded. The TCP Request needs **36ms** to be sent from the client to the server and come back. The server waits **25ms** before sending every HTTP response for every object. Next, it takes **30ms t**o send the HTTP request and the server requires **44ms** to send each object.

Answer: Non-Persistent connection:

Total RTT = No. of objects * (1 RTT for TCP + 1 RTT for HTTP request-Response)

= 55 * (36 ms + 30 ms + 25 ms + 44 ms)

= 55 * 135 ms = 7425 ms or 7.425 sec.

c) **Calculate** the **total time** the client takes to load the webpage. **[4]**

Answer:

Total loading time = Total RTT + File transmission time for all objects

= 7425 ms + 55 * 75 ms

= 11550 ms or 11.55 sec.

Q2: Name three application layer protocols involved in exchanging an email and their type (push or pull). **[3]**

See the slide.