**A**

# BRAC UNIVERSITY
## Department of Computer Science and Engineering

Examination : Semester Midterm | Semester: Summer 2023
Duration: 1 Hour 30 Minutes | Full Marks: 60

**CSE421 / EEE465 : Computer Networks**

Answer **ALL** the following **3** questions. (**Pages: 2**)
Figures in the right margin indicate marks.

| **Name:** | **ID:** | **Section:** |
|---|---|---|

**Q.1. a)** **Identify** which layers are responsible for adding addresses to the data? **Identify** the address that changes on each hop. **2+2**
**[CO1]**

**b)** **Differentiate** between CNAME resource records and NS resource records. **4**
**[CO2]**

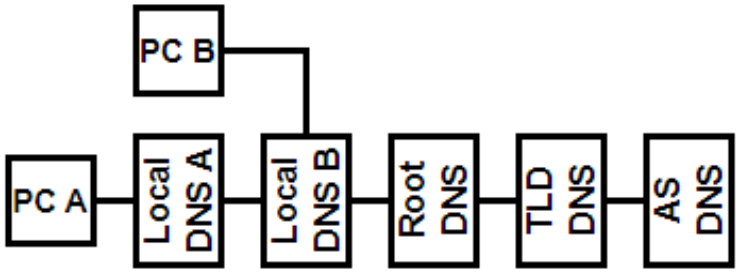
**c)** With the current four top uploaders (all peers), a new peer is not able to download a file fully due to missing chunks. However, the new peer was able to download the file successfully soon after. **Justify** how this may be possible. **5**
**[CO2]**

**d)** DASH helps us to watch seamless video content, i.e., no buffering while watching a video on the internet. **Explain** how and what needs to be done by the content server. **7**
**[CO2]**

**Q.2. a)** BRACU Proxy server has the webpage of ***www.techno.com*** downloaded in its cache dated 12th June 2023. You send a request for the above same webpage from a Lab PC on 15th of June 2023. **Explain** if you will get the latest version of the webpage or not. Let's assume the page was updated with new values on the 14th of June 2023. **5**
**[CO2]**

**b)** **Explain** how HOL (Head of Line) blocking creates a problem in HTTP/1.1. **5**
**[CO2]**

**c)** From the below figure, PC-B visits abedu.ac.bd on 13th July at 5:30 AM and gets an RR of (abedu.ac.bd, 172.69.99.13,A,24) where the TTL is given in hours. On the same day, PC-A later visits the same website. Given, each DNS lookup requires 25ms. **3 + 4 + 3**




**[CO3]** **I.** **Calculate** the RTT (in ms) to fetch the IP address for PC-A.

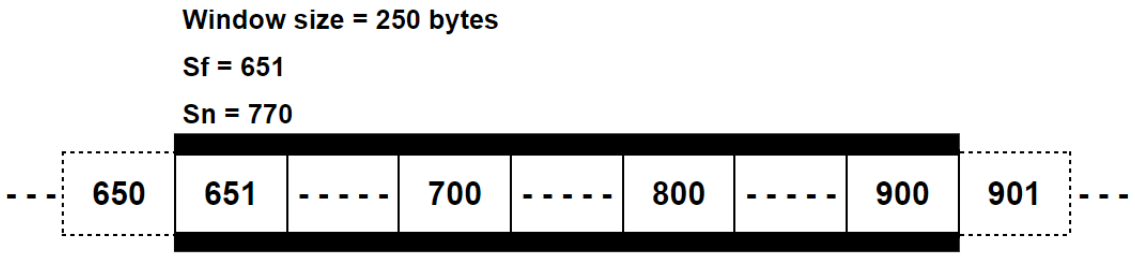
Upon receiving the IP address, PC-A with unlimited download speed opens a persistent connection with the web-server. It takes PC-A 48ms to send a packet, while the server requires 50ms to send the packet to PC-A. Also given, the website has a total of 18 objects including the base html file each requiring 123ms to load.

[CO3] **II.** **Calculate** the total RTT (in ms) for the client to receive all the objects after fetching the IP address.

[CO3] **III.** **Calculate** the total time (in ms) required to view the whole page from the point of requesting the website on your browser.

**Q3. a)** [CO2] You have opened 3 tabs of Chrome Browser and the WhatsApp application. Name the kind of port numbers that will be issued for these applications you have opened. Explain if they can have the same port numbers or not. **2 + 3**

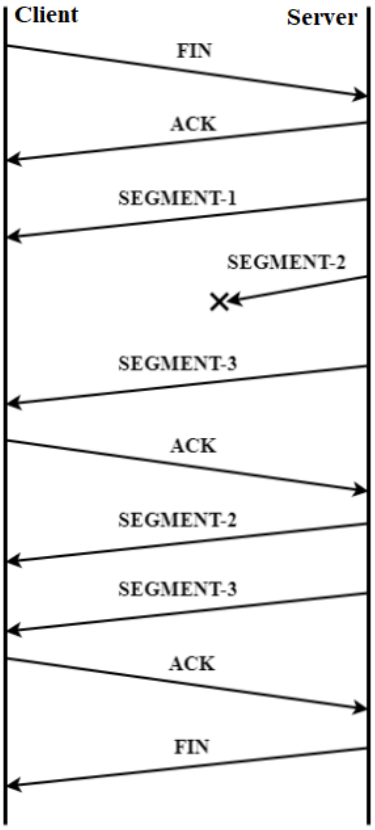
**b)** [CO3] **3 + 2**




Refer to the above figure, it represents the window of a receiver PC-A. A few seconds later, PC-A receives an acknowledgement segment, from Server-B, with the acknowledgement number of **731** and the **RWND** number of **200 bytes**. After receiving this acknowledgement segment, **estimate** the Sf, Sn, and start and end byte number of RWND of PC-A.

**c)** After requesting certain data segments, the Client sends the FIN segment, with the sequence and acknowledgement number of **1025** and **8765** respectively and the FIN flag on. **3 + 2 + 3 + 2**

[CO3] **I.** **Determine** the sequence and acknowledgement number of the first ACK segment that the server sends as shown in the figure.




The server sends 3 data segments carrying **125**, **286** and **456** bytes respectively. The 2nd segment gets lost in transmission.

[CO3] **II.** **Determine** the sequence number of the first ACK segment sent by the client as shown in the figure.

The lost segment is retransmitted using the Go-Back N ARQ method.

[CO3] **III.** **Determine** the acknowledgement number of the FIN segment sent by the server.

[CO2] **IV.** **Name** the type of TCP connection termination being used here.

==========THE END==========