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BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination : Semester Midterm | Semester: Spring 2023
Duration: 1 Hour 20 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) CO1	Bob visits a website and inputs his username and password to log-in. He is able to successfully log in. Below is the list of steps that Bob's PC took to send the login request to the server. Re-arrange them in the correct order of the OSI model. *Writing the serial numbers in the correct order is enough for the answer.* 1. Bob's PC identifies the process to send the request 2. Bob's PC identifies the server PC. 3. Bob's session is created 4. The PDU leaves Bob's PC via the Ethernet port 5. Bob's user credentials are encrypted 6. Bob clicks the submit/login button 7. Bob's PC identifies the next hop to send the PDU.	**5**
b)	With 10 peers in the swarm of a given torrent, state if it is possible for a new client to download the torrent successfully. Justify your answer, yes or no.	**3+2**
c)	A client sends a request for a web page which goes to the proxy server. The proxy server has a copy of the requested website. Will the proxy server send a Conditional GET request to the origin server? Explain.	**5**
d)	An 8k video requires **100mbps** bandwidth to view without buffering. Even with a lower access link bandwidth, you can still stream the 8k video with 8k resolution without any buffering. How is it possible?	**5**
Q 2. a) CO2	How do websites track you even if you do not sign up? State how tracking helps the HTTP protocol.	**2+3**
b)	Between iterative and recursive DNS lookup, which one is better overall? Justify briefly.	**5**
c)	Nonte visits www.ahare.com on his web browser on **24th January 2023 at 10:30 AM with a DNS TTL of 5 hours**. On the other hand, Phonte visited the same website on the **24th January 2023 at 4:00 PM** with a **DNS TTL of 10 hours**. Phonte's PC sends the DNS request (taking **23ms** to be sent) to its local DNS server. **I.** Determine the RTT required for Phonte's PC to fetch the IP address.	**3**
	After fetching the IP address, Phonte's PC sends the request to the website server (which takes **39ms** to be sent only) to open a persistent HTTP connection with the server and request **30 objects**, including the base HTML page. Assume each object size is **12 MegaBytes**. Furthermore, the server upload speed is **X Mbps**.	

	II. Calculate the total RTT required to fetch all the objects from the point when you inserted the URL in the browser. **III.** Given, the total file transfer time / HTTP Response Time, including the RTT found in (II), is **5344 ms**. Find **X.**	**3 + 4**
Q 3. a) CO3	A web server receives three HTTP requests containing the same port number. Explain if this can be true. How will the server differentiate between the three requests?	**3+ 2**
b)	UDP does not offer reliability, state which fields are not present in the header for that purpose? But every application requires some sort of reliability. Explain where and how that reliability is given when the application uses UDP.	**2 + 3**
c)	In a selective-repeat TCP connection, an HTTP request (**234 bytes** each) is sent for each of the data segments (**889 bytes** each). Like this, a total of **20 data segments** are sent from the server, including the base HTML file. Furthermore, the client has an ISN of **8924** and RWND of **10000 bytes** and the server has an ISN of **203** and a RWND of **23000 bytes**. I. Calculate the sequence and acknowledgment number of the 4th data segment. The **10th data segment** got lost on its way to the client. II. What's the sequence and acknowledgment number of the 13th HTTP request that's sent to the server? III. What's the RWND of the client when it received the 13th data segment? Assume the first 5 segments were processed by the client.	**3 + 3 + 4**

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