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BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination : Semester Midterm | Semester: Fall 2022
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 **State** the name of the layer responsible for process-to-process delivery. **Explain** how it is different from host-to-host delivery. **5**

b) A company or organization can have the same aliased name for its mail server and the web server. Discuss how a DNS Request differentiates between the two servers. **Give an example**. **5**

c) **2 + 3**

Device	Status	Upload Speed	0	1	2	3	4	5	6	7	8	9
A	ON	12		X					X		X	X
B	ON	100	X	X	X	X		X	X	X	X	
C	OFF	60	X		X	X	X					
D	ON	11	X	X	X	X	X	X	X	X	X	X
E	ON	15		X		X		X		X		
F	ON	14	X			X						
G	ON	-										

A BitTorrent protocol allows a client to connect to four clients giving the maximum upload speed. In such case, with reference to the above table:

I. Client G joins the swarm. Identify if client G can successfully download the file from the current top four uploaders.

II. Given, client D's upload increases to 40mbps resulting in re-selection of top four uploaders for client G. What would be the time taken for client G to download the file if the file size is 890 megabit?

d) **State** the benefits that DASH provides to a user. Explain the purpose of a manifest file in a streaming multimedia setting. **5**

Q 2. a) CO2 You visit www.daraz.com using Google Chrome browser at 9:30 AM. Later, at 6:00 PM, you revisit the website using the Mozilla Firefox browser. According to the concept of cookies, you should have been able to view your previous searches when you visit the same website. But in this scenario, you did not see anything related to the last time you visited the website. **Identify** the reason behind this. **5**

b) Name the HTTP request method that allows Proxy servers to request the same object, which the Proxy server already has a copy in its cache. This saves time; **explain** how. **5**

c) Aima writes **www.CSE421.com** on her web browser URL box. To access the website, Aima's PC sends a DNS request to its local DNS server. The local DNS server has no information in **2 +**

its cache. The local DNS server used **iterative DNS lookup**, with an RTT of **19 ms** each, to retrieve the IP address for **Aima's PC**. **4 +**

I. **Determine** the total RTT for **Aima's PC** to fetch the IP address. **4**

After fetching the IP address, **Aima's PC** sends the TCP request to the website server (which takes **35ms** to be sent only) to open a **persistent** HTTP connection with the server and request **21 objects**, including the base HTML page. It takes the server **5ms** to retrieve each object from the database and prepare it to be sent. Each object takes **125ms** to be downloaded by the client..

II. **Calculate** the total RTT required to fetch all the objects after retrieving the IP address

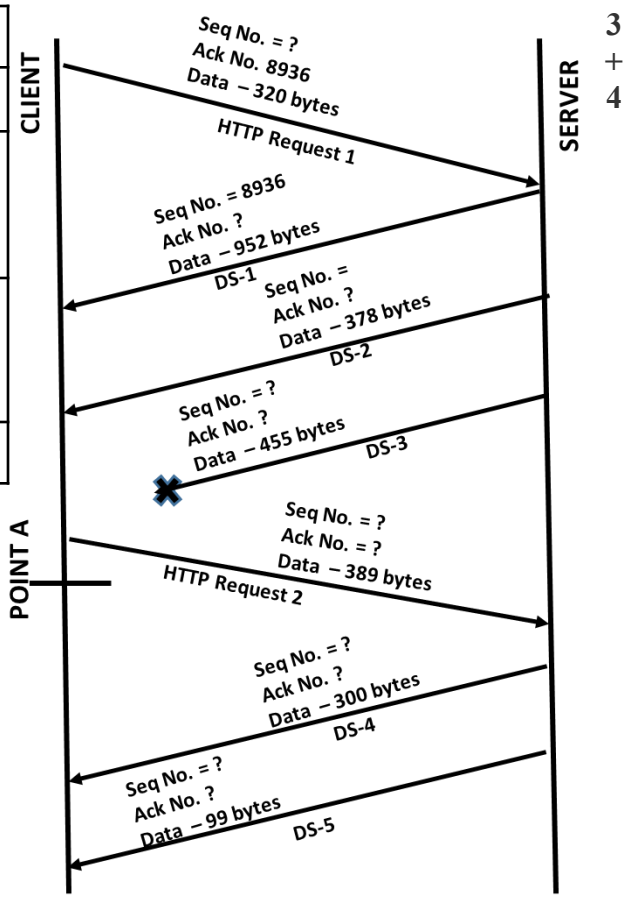
III. **Calculate** the total time **PC A** takes to load the webpage.

Q 3. a) CO3 The UDP header has a field called checksum. **Explain** what this field does. **4**

b) PCA sends data of 1800 bytes starting from sequence number 3001 to PCB. PCA wishes to indicate that 700 bytes of data have to be processed urgently. **Discuss** how PCA will inform this to PCB. **5**

c) In a **go-back-n** TCP connection, the client & server have the following values and flow: **4 + 3 + 4**

	Client	Server
ISN	**2045**	**8935**
Segment Sizes DS - Data Segment	**HTTP Request 1:** *(Also the third segment of the 3 way handshake)*: 320 bytes	**DS 1:** 952 bytes **DS 2:** 378 bytes **DS 3:** 455 bytes
	HTTP Request 2: 389 bytes	**DS 4:** 300 bytes **DS 5:** 99 bytes
RWND	**3020**	**6450**



I. **Calculate** the sequence and acknowledgment number of the server's HTTP Request 2 sent to the server.

II. The client sends all the received segments to the upper layers at point A. **Determine** the rwnd of the client after the client receives DS-5?

III. **What** are the sequence number and acknowledgment number of the client after receiving DS-4?

==========**THE END**==========