B

BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination : Semester Midterm | Semester: Summer 2025
Duration: **1 Hour 10 Minutes** | Full Marks: **45**

CSE421 / EEE465 : Computer Networks

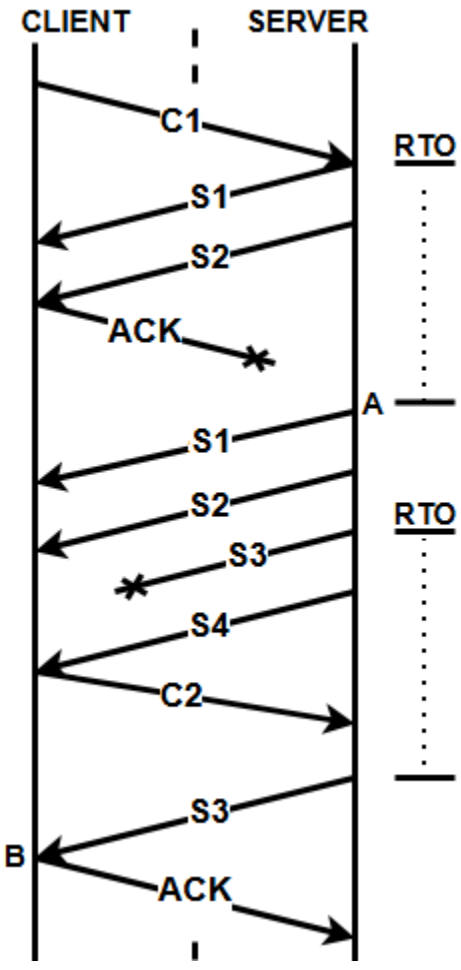
Answer **ALL** questions. (**Pages: 2**)

Figures in the right margin indicate marks.

Name:	**ID:**	**Section:**

Q1 [CO1]	**Identify** the OSI model layers involved when: **I.** The email client converts the composed message into a data stream for transmission. **II.** The computer checks if any data was lost or damaged and asks for it again if needed. **III.** The data is encrypted or compressed so it can be sent more securely or quickly. **IV.** The message is sent as electric pulses or radio waves through cables or air.	**4**
Q2 [CO2]	Shirin set up Jamil's email account on his tablet. Later, Jamil read an important email on that tablet. But when he got to his office and opened his email on his desktop computer, the email was missing. Jamil says he did not delete the email from the tablet, and no one else used his devices. **State** the most likely reason the email is still on the tablet but not showing on the desktop computer.	**4**
Q3 [CO2]	LazyStream Inc. is receiving complaints from users about slow video streaming and long loading times for popular content. Many users in the same geographic area are accessing the same videos and web pages repeatedly. As a network engineer at LazyStream Inc.: **I.** **Mention** what network-based solution you can suggest to make video streaming faster for all users in that area, without upgrading their individual internet connections. **II.** **Find out** why the very first user who accesses a video in that area might experience slower performance than users who access it later.	**3 + 3**
Q4 [CO2]	Your company's website www.mycompany.com is hosted on a server with the IP address 192.0.2.50. You recently bought a second domain name, myccompany.com, and want it to also point to the same website. You added a DNS record to your authoritative DNS server to make this work. The TTL (Time To Live) for the record is set to 3600 seconds. **I.** **Mention** the type of DNS record you likely added to make myccompany.com point to www.mycompany.com? **II.** If you later change the IP address of www.mycompany.com, will myccompany.com automatically point to the new IP? **Explain** why or why not.	**3 + 3**
Q5 [CO2]	Rina is testing a chat application that runs on her laptop. When she sends a message to a friend, the app connects to a central chat server on the internet. The server is set up to listen on port 443. Rina uses a tool to inspect the outgoing packets and sees that her computer is using port 53241 to send the message. **Identify** the following:	**3 + 3**

	I. What type of port is port 443, and why is it used by the chat server? **II.** What type of port is port 53241, and why is it used by Rina's computer in this case?	
Q6 [CO3]	A browser needs to load an HTML page that includes references to the following resources using a **non-persistent HTTP** connection *(The network link has a bandwidth of T)*: • Base HTML file, taking **321 ms** to download • 3 embedded videos, each taking **250 ms** to download • 5 Java applets, each taking **111 ms** to download Each of the three control packets, such as **SYN packet, SYN-ACK packet, and ACK-HTTP request packet,** incurs a one-way delay of **64 ms**. In contrast, an HTTP Response experiences a one-way delay of **48 ms**. All transfers occur at a constant rate, with no use of parallel TCP connections or HTTP pipelining. **I.** Calculate the **total round-trip time** for loading the HTML Page. **II.** Compute the **total time required** to fetch the HTML page **III.** State, mathematically, how the total time in **(II)** changes if the **link bandwidth T is halved.**	**3 + 3 + 3**
Q7 [CO3]	In a **Go-Back-N** TCP connection, the client and server have the following values and flow: ISN of Client = **1100**, RWND of Client = **8000**; ISN of Server = **1214**, RWND of Server = **3200** The data size of the segments is given as shown in bytes: C1=**?**, C2=**132**, S1=**1260**, S2=**1443**, S3=**122** and S4=**220** **I.** If the **acknowledgement** number of the **second S2** segment is **2000**, calculate the data size of **C1**. **II.** Calculate the **sequence** and the **acknowledgement** number of the **C2** segment. **III.** Calculate the rwnd of the client at **point B**.	**3 + 4 + 3**



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