B

BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination : Semester Midterm
Duration: **1 Hour 10 Minutes**

Semester: Spring 2025
Full Marks: **45**

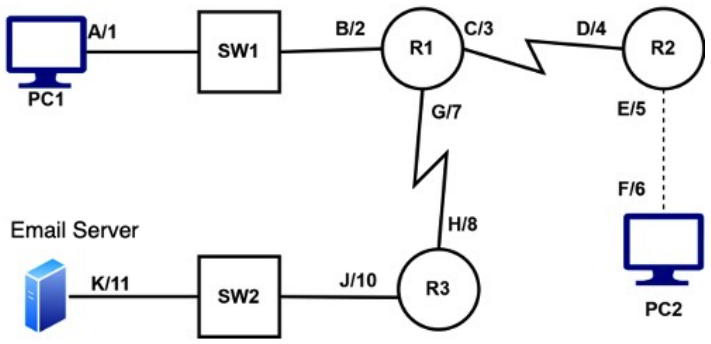
CSE421 / EEE465 : Computer Networks

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

Figures in the right margin indicate marks.

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

Q1 [CO1] A request packet, originally generated by PC1, is currently being forwarded by Router R1 to the Email Server. Identify the **source and destination Port, IP, and MAC** Addresses. Consider the alphabets as physical addresses and the numbers as logical addresses (given beside the devices in the figure). You need to figure out the port addresses yourself, or you can mention the type of port address used.



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Q2 [CO2] A university's document submission portal allows students to:

I. Upload a new assignment.
II. Update a previously submitted assignment.
III. Delete a mistakenly uploaded assignment.

State HTTP methods should be used for each action, and the method used for action number **(II)** should be explained.

3 + 2

Q3 [CO2] A university is hosting its website (www.university.edu) on a cloud server and wants to configure its DNS settings correctly. The IT team must ensure that www.university.edu can be accessed via a domain name instead of an IP address. Users should be able to access the website even if they type university.edu without 'www'.

State the two DNS records that should be used to achieve these tasks, and **explain** in one line their purpose in each case.

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Q4 [CO2] You have created an e-commerce website that sells computer parts. However, when customers search for specific products, your website does not appear at the top of search results, even though the search terms exactly match the product names on your website. Later, you made an important security improvement to your website, and after that, it started appearing higher in search results.

State the likely issue that caused your website to rank lower, and **mention** what type of security improvement was made.

2 + 2

Q5 [CO2] Dipu is watching two IPTV channels in two tabs of his browser. **Identify** which fields will be used to demultiplex the data once the device receives the segments from the servers. For one of the channels, your device has segments in this sequence: 4, 2, 5, 1, 3. **Determine** the sequence in which the segments will be sent to the application layer. **2 + 3**

Q6 [CO2] On **March 18th, 2025**, a request was sent to the proxy server for a webpage. The proxy server has a copy of the page stored with a TTL of **5 days** from **March 16th, 2025**. **Mention** what action the proxy server will take in response to the request. And also, **explain** how this action helps save bandwidth and improves efficiency. **2 + 3**

Q7 Phil is browsing an online store and requests a product page with several objects (images, scripts, and stylesheets) to load. It took **60 ms in total** to get the IP address from the local DNS server, and a **non-persistent** connection was opened between Phil's laptop and the web server. The page consists of **15 objects** (including the base HTML file). The first **10 objects** are **3 MB** each, and the remaining objects are **7 MB** each. **4 + 3**

[CO3] **I.** If the **total RTT delay** for all objects is **1200 ms** after the DNS resolves the IP address, **calculate** the **single RTT (in ms)** from Phil's device to the server and back.

[CO3] **II.** If the **server's speed is 100 Mbps**, calculate the file transmission time for all objects in **ms**.

Q8 After the TCP handshaking, the client with **RWND=8000 bytes** and the server with **RWND=16000 bytes** transferred the following segments using **Go-Back-N** protocol. The ISN of the client is **9876** and the ISN of the server is **5432**. **4 + 3 + 3**

From	To	Segment Name	Data Size (bytes)	Lost
Client	Server	C1	645	No
Server	Client	S1	687	**Yes**
Server	Client	S2	586	No
Server	Client	S3	652	No
Client	Server	Ack-1		No
Server	Client	S1	687	No
Client	Server	Ack-2		No

[CO3] **I.** **Calculate** the sequence and the acknowledgment number of the Ack-1 segment sent by the Client.

[CO3] **II.** **Calculate** the receiving window size of the Ack-2 segment.

[CO3] **III.** **Calculate** the server's Sn value after sending the second S1 segment.

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