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BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination : Semester Midterm | Semester: Summer 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. CO1 **a)** Proxy servers act only as servers [Agree or Disagree]. **Explain** briefly how a proxy server minimizes the access link load to the Internet. **5**

b) **(i) Discuss** if an organization's Web server and mail server may have the same alias for a hostname (for example cs.iist.bd.). **3 +**
(ii) A new peer 'Alpha' joins BitTorrent without possessing any chunks. She cannot become a top-four uploader for any of the other peers, since she has nothing to upload. **Discuss** how Alpha will get her first chunk. **2**

c) On the **10th July 2022** at **13:01:22**, **PC B** visited the website **whatanexam.com**. To access the website, the local DNS server replied to **PC B's** DNS request with **(whatanexam.com, 100.3.40.56, A, 24)**, where TTL is given in **hours**. The local DNS server used **iterative DNS lookup**, with an RTT of **50 ms** each, to retrieve the IP address for **PC B**. Next, on the **11th of July** at **10:01:23**, **PC B** visited the same website. **2 + 4 + 4**

I. **Determine** the total RTT for **PC B** to fetch the IP address on the 11th of July.

After fetching the IP address, **PC B** sends the request to the website server (which takes **25ms** to be sent) to open a **non-persistent** HTTP connection with the server and request **12 objects**, including the base HTML page, each requiring **85ms** to be downloaded.

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

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

Q 2. CO2 **a)** Rifat opens a chrome tab to access his **Daraz** account to buy a laptop. **List** the number and the type of the source and destination port addresses that are being used in the request segment sent via the chrome tab to the Daraz Server. **4**

b) **I.** For connectionless demultiplexing, **list** the addresses required to send a segment to the appropriate socket. **3 +**

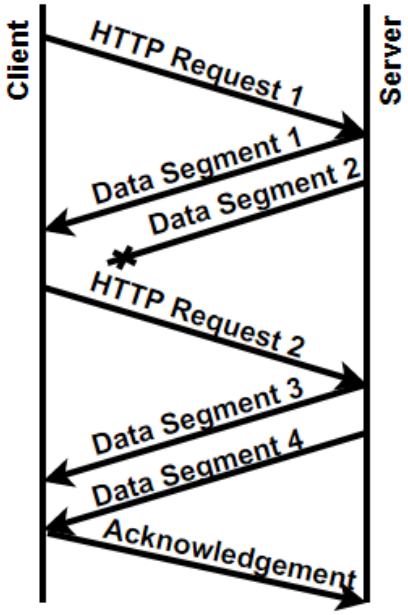
II. Given that the value of **HLEN** of the TCP header is **1010(binary)**. **Determine** the header length. **3**

c) In a **selective-repeat** TCP connection, client & server have the following values (next page): **4**

I. **Calculate** the **sequence** and **acknowledgment** number of the server's **Data Segment 1** sent to the client. **+ 3**

II. The **2nd** data segment was lost on its way to the client, and the client processed the **1st** data segment as soon as it had received the first segment. **Calculate** the **sequence** number and **rwnd** of the **acknowledgment segment** that the client sends to the server after it receives the **4th** segment. **+ 3**

	Client	Server
ISN (At the start of TCP handshake)	9666	5549
Segments sent	**HTTP Request 1** *(Also the third segment of the 3 way handshake)*: 569 bytes	**Data Segment 1:** 568 bytes **Data Segment 2:** 650 bytes
	HTTP Request 2: 999 bytes	**Data Segment 3:** 266 bytes **Data Segment 4:** 123 bytes
rwnd	8000	7000



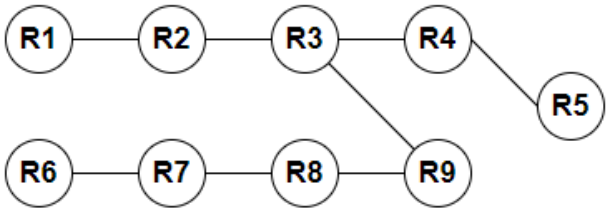
Q 3. a) CO3 **I.** Alice is **sending** data to Bob. Alice needs to re-arrange the following tasks in the correct order so that the data can leave her computer. Help her. **Traverse** as per the order in the OSI layers. Just write the numbers in sequence. **3 + 2**

- - - - **1.** The data is transmitted over the medium.
- - - - **2.** Creates a reliable process-to-process connection.
- - - - **3.** Encrypts data.
- - - - **4.** Controls sessions.
- - - - **5.** Alice composes a letter for Bob.
- - - - **6.** Fixes the source and destination IP addresses.
- - - - **7.** Provide hop-to-hop delivery

II. **Identify** the addresses that remain the same at each hop during data transmission.

b) Given, the ping output of Router **R2**. The routers in the topology set the default max TTL value of **123**. Determine if the ping was successful and the router that the **R2** was pinging. **5**

```
Request timed out.
Reply from 10.10.111.10: bytes=32 time=23 TTL=119
Request timed out.
Request timed out.
```



c) Given, a **datagram** of size **28939 bytes** and a **MTU** of **3038**. Also, the header of the packets consumes **38 bytes**. Assume data starts from **0** byte number. **2 +**

I. **How many** packets are required to transfer the whole datagram? **2**

II. **What's** the **MF** of the **3rd last** packet? **+**

III. **What's** the **data** size of the **last** packet? **3**

IV. **What's** the **offset** value of the **2nd** packet? **+**

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END OF QUESTION PAPER **2**

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END OF QUESTION PAPER