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BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination : Semester Midterm | Semester: Spring 2022
Duration: 1 Hour 20 Minutes | Full Marks: 55

CSE421 / EEE465 : Computer Networks

Answer all the following **3** questions. (**Pages: 2**)
Figures in the right margin indicate marks.

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

Question 1. CO1

a) An ecommerce company called "e-buys" has its own DNS server. The Resource Records (RR) for this company in the top level server ".com" are : (e-buys.com, dnscontrol.e-buys.com, NS) and (dnscontrol.e-buys.com, **200.112.10.1**, A). Their web server "e-buys" has the IP address **200.112.30.5**. First state the RR for the web server that they need to put in their own DNS server. **1 + 4**
You enter "www.e-buys.com" in your PC browser to visit their website. Draw or list the steps required to find the IP address, without putting extra burden on the Root Servers.

b) A FTP server has an upload speed of **100Mbps**. It is trying to upload a **20 Mbytes** file to 15 clients. How much time should it take to distribute the file to all clients? Is there anything else that we should consider when we calculate the maximum time required to distribute the file? **3 + 2**

c) You want to watch a movie from Netflix. You send a request to Netflix. Do you stream the movie directly from the Netflix servers in the cloud? Explain in brief. **5**

Question 2. CO2

a) Bob uses Chrome to open his email account and has sent Charlie an email. Charlie receives the email in such a manner that he is able to read it only once. **Choose** the correct protocol/s involved between **2 + 1**

- **I.** Bob's PC and Bob's Email Server (state in one line why this protocol was used) **+ 2**
- **II.** Bob's Email server and Charlie's email server
- **III.** Charlie's email server and Charlie's PC.

b) Your cookie ID for "**www.nike.com"** was 98021, but you accidentally cleared all cookies from your browser. Explain what will happen when you visit Nike's website a few days later. **5**

c) Given, you want to visit "**welcomebacktophysicalexams.com"**. Your network has a local DNS server and is using a recursive lookup to fetch IP addresses and RTT of **29ms**. Others in your network have already visited the above website a few hours before your visit. **2 + 4 + 4**

Please turn over the page

After fetching the IP address, your PC sends a **persistent** HTTP request of size **109 bytes** to bring **13 objects** of size **31 bytes** each. In this particular connection, it requires the PC **67ms** to send the TCP request to the server.

I. What is the total RTT **in ms** in the DNS lookup?

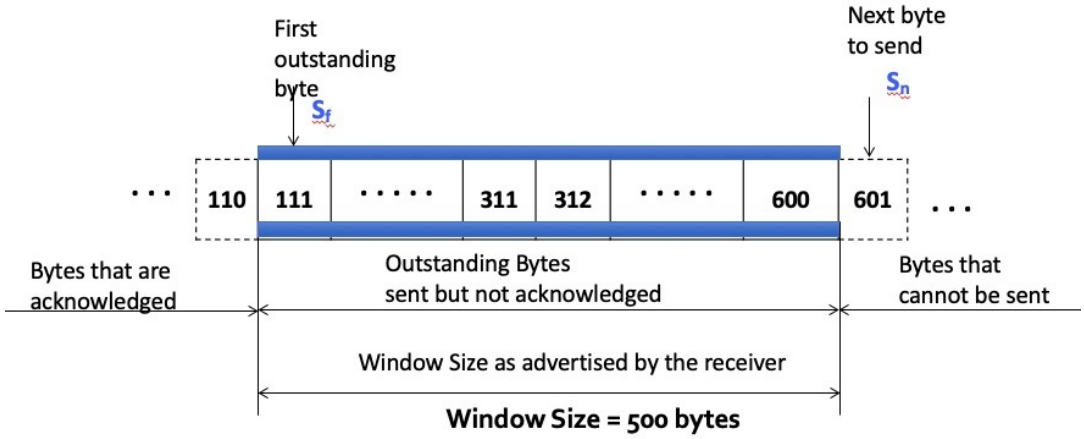
II. What is the total RTT **in ms** required (including DNS) to bring the full object?

III. What is the total file transmission time **in ms** after fetching the IP address?

Question 3. CO3

a) You have opened two applications in your laptop and are using them to send data. One is Microsoft Outlook and the other is a web browser. What will be the type of source port numbers and destination port numbers of the two applications? State the port numbers used for the destination application. **3 + 2**

b) Refer to the diagram below. The diagram represents the window of a sender device. The sender device receives an acknowledgement segment from the receiver with the acknowledgement number **313** and the rwnd of **300 bytes**. What will the values of the **Sf** and **Sn** variable be now? **5**



c) Client A and Server B are communicating over a TCP connection. Client A started the three way handshake with the initial sequence number of **2905**. Server B's initial sequence number is **196**. The window size of Client A is **591 bytes** and the window size of Server B is **243 bytes**. Client A sends the HTTP GET request of size **130 bytes** within the third step of the TCP 3 way handshake (the ACK segment from the client). Server B answers with 2 segments containing the requested data. The first segment size is **68 bytes** and the second segment size is **31 bytes** respectively. **6 + 4**

Client A receives only the first segment within the timer. Unfortunately, the second segment did not reach Client A. So Client A sends an acknowledgement segment. Assume that Client A uses Go Back N protocol.

I. What is the sequence number and acknowledgement number of the HTTP GET request segment from Client A?

II. What will be the window size of the second ACK segment sent by Client A?

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END OF QUESTION PAPER