CSE421 Assignment 01 [MSMA | 2024 Fall]

Total points 90/100

Answer all the questions in this form. PDF submission is optional for the math problems/short answer questions. **You can submit only once even if you submit by mistake. Make sure that your answers are put correctly by refreshing the page. Deadline: November 05, 2024 (Tuesday) 11:59:59pm**

[This is optional] Submit your workings through a pdf file. Naming Format: ID_Name

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✗ **Q1. Which options of the following are correct? ***

2.5/5

- [x] Encapsulation is also done by the intermediary devices ✓
- [ ] Decapsulation is done only by the receiver end device
- [x] Protocols specify how to implement what needs to be done ✗
- [x] Two layers can have modifications simultaneously ✓

Correct answer

- [x] Encapsulation is also done by the intermediary devices
- [x] Two layers can have modifications simultaneously

✗ **Q2. Transport layer is concerned with *** 2.5/5

- [x] Sending the segments of multiple processes to the network layer simulteneously ✓
- [ ] Sending a packet from one host to another host
- [x] Adding port address to identify the application ✓
- [x] Adding sequence number to identify the order of the process ✗

Correct answer

- [x] Sending the segments of multiple processes to the network layer simulteneously
- [x] Adding port address to identify the application

Answer Q3 to Q6 based on the following scenario

You are requesting a webpage from BRACU server. There are 6 routers and 9 switches in between your computer and the server.

✓ **Q3. How many times the IP address of the packet will change? *** 5/5

0 ✓

✓ **Q4. How many times the MAC address of the packet will change? *** 5/5

6 ✓

✓ **Q5. How many times the network layer will be traversed? *** 5/5

8 ✓

✓ **Q6. How many times physical layer will be traversed? *** 5/5

17 ✓

✓ **Q7. "Application Protocols specify how Application Software will work along with specifying what the software will do."** *5/5

- ○ True
- ◉ False ✓

✓ **Q8. Client can work as both server and client in *** 5/5

- ☐ Client-Server method
- ☑ P2P method ✓

✗ **Q9. Upon getting a request for a webpage by the browser, the server *** 0/5

- ○ sends all the objects at a time
- ◉ sends the base file first ✗
- ○ sends the html code of the base file
- ○ sends the html code for all the objects at a time

Correct answer

- ◉ sends the html code of the base file

Answer Q10 to Q14 based on the following scenario

You have requested to visit www.bracu.ac.bd website using a **persistent HTTP connection**. There are **X objects** in total. Among them, the first **7 objects are 4 MBytes each** and the remaining **objects are 5 MBytes each**. Your computer's download speed is **80 Mbps**. It takes **16ms** for a small **TCP packet** to go from your computer to the BRACU server and come back; **18ms** for a small **HTTP packet** to come from the BRACU server to your Computer. Your device waits **5 ms** after getting an **HTTP response** to send the **next TCP/HTTP request** (Consider this a **separate waiting delay**). The **total RTT** to fetch all the objects is **772ms**.

✓ **Q10. Calculate the value of X.** * 10/10

21 ✓

Feedback

Let, total objects be X.
TCP RTT = 16 ms
*HTTP RTT = 18*2=36 ms*

*For persistent, total RTT = TCP RTT + X * HTTP RTT*
*=> 772 = 16 + X * 36*
=> X = 21

✓ **Q11. What is the file transmission time? (in ms)** * 10/10

9800 ✓

Feedback

*Total size = 7*4 + (21-7) * 5 = 98 Mbytes = 784 Mbits*
file transmission time = 784/80 = 9.8 s = 9800 ms

✓ **Q12. What is the total time taken to load the website? (in ms)** * 10/10

10672 ✓

Feedback

Total time = total RTT + file transmission time + extra delay
*= 772+9800+(21-1)*5 = 10672 ms*

✓ **Q13. If the web browser uses non-persistent HTTP connection instead of persistent HTTP connection,** *10/10

- [x] Total RTT would be higher ✓
- [ ] Total RTT would be lower
- [ ] Object transmission time would be higher
- [ ] Object transmission time would be lower
- [x] Total response time would be higher ✓
- [ ] Total response time would be lower

Feedback

Number of objects don't change, so the object transmission time will remain same.

✓ **Q14. What is the total response time if the browser uses non-persistent HTTP connection? (in ms) [The number of objects will be same as found in Q11]** *15/15

10992 ✓

Feedback

Total time = total RTT + file transmission time + extra delay
*= (16*21+36*21)+9800+(21-1)*5 = 10992 ms*