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Assignment - I
CSE421 Computer Networks

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Sec: 22

Fall 25

→ Solution of Mid ←
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set - A

Q1. a) Disagree. Proxy servers act as both Client and Server.

Proxy servers store frequently accessed web data and serves it to user locally. It reduces repeated requests to the internet. Which results in reducing response time for client request and saves bandwidth by preventing downloading of same content multiple times. Thus, a proxy server minimizes the access link load to the Internet.

b) i) Yes, a web server and a mail may have the same alias/
domain name like cs.iist.bd. But they maintain different DNS
Records, such as: Type A or CName for the web server and
Type MX for the mail server.

ii) In BitTorrent, Alpha gets her first chunk from seeders or from other peers willing to upload to new members randomly. Once she receives a chunk, she can start uploading and become eligible for top-four uploader.

(c) I. TTL = 24h, visit within \rightarrow 24h.

So, IP address record is still valid. Local DNS will reply immediately. No iterative lookups.

So, RTT = 0ms.

II. After fetching IP Address, meaning \rightarrow 11 July.

$$\begin{aligned}\text{Total RTT} &= \text{TCP RTT} \times 12 + \text{HTTP RTT} \times 12 \\ &= 50 \times 12 + 25 \times 12 \\ &= 900 \text{ ms}\end{aligned}$$

$$\begin{aligned}\text{III. Total Time} &= 0 + \cancel{\text{RTT}} + \text{FTT} \\ &= 0 + 900 + 12 \times 85 \\ &= 1110 \text{ ms} \\ &= 1.11 \text{ s}\end{aligned}$$

— o —

Q2. (a) source Port:

<u>Number Range</u>	<u>Port Type</u>
49152 to 65535	Private/Dynamic Port

Destination Port:

<u>Number Range</u>	<u>Port Type</u>
0 - 1023	Well known port

[For destination, we can say the port number at Paraz may be 443, if we assume it uses HTTPS connection]

(2)

- (b) i. For connectionless Demultiplexing (UDP), required address:
- Destination IP Address
 - Destination Port ~~At~~ Number (only).

II. value of HLEN = 1010_2

$$= 10_{10}$$

So, Header Length = 10×4 bytes = 40 bytes.

(c) i. seq. Number = Server's ISN + 1 (for SYN)
 $= 5549 + 1$
 $= 5550$

ACK number = Client ISN + 1 + HTTP request size
 $= 9666 + 1 + 569$
 $= 10236$

ii. segment 1 \rightarrow received: seq : 5550

segment 2 \rightarrow lost : client expected $5550 + 568 = 6118$

Segment 3 \rightarrow seq : $6118 + 650 = \cancel{1268} 6768$

Segment 4 \rightarrow seq : $6768 + 266 = 7034$

Segment 2 was lost.

So, ACK \rightarrow Server's ISN + 1 + Segment 1 size

$$= 5549 + 1 + 568$$

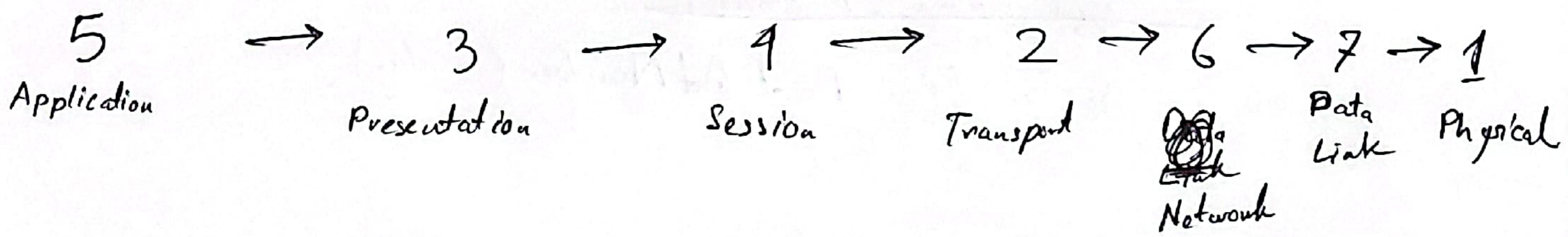
$$= 6118$$

$$\left. \begin{array}{l} \text{rwnd} = 8000 - 568 - 266 \\ \quad \quad \quad - 123 \end{array} \right\}$$

$$= 7043.$$

$$\text{Seq Number} \rightarrow 10236$$

Q3. a) 1.



II. During Data Transmission, Source & Destination IP Addresses remain the same at each hop.

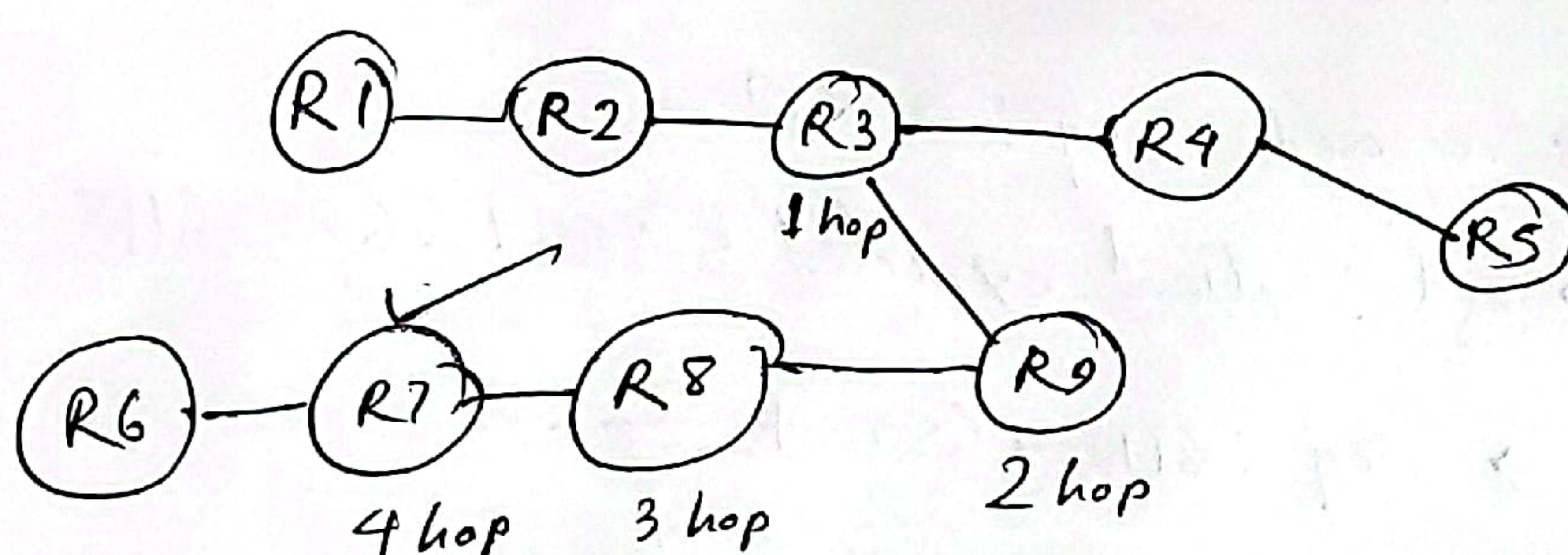
(b) Default Max. TTL = 123

Reply TTL = 119

$$\text{TTL Decreased} = 123 - 119 = 4$$

[So, 4 hops between Source and Destination]

Now, Tracing :



So, Yes, ping was successful, the R2 was pinging R7.

(3)

Q 3. (c)

[I think, Q3 (b) and (c) are not discussed in our Syllabus. So, I tried to solve by watching YouTube videos and using online Resources.]

I. Max payload size = $3038 - 38 = 3000$ byte.

So, packets required to transfer the whole datagram

$$= \frac{28939}{3000}$$

$$= 9.64$$

≈ 10 packets.

II. 3rd Last Packet means \rightarrow 8th packet.

As, 8th packet is not the last packet, so, MF must be set to 1.

So, MF \rightarrow 1.

III. Data carried by 1st 9 packets = 9×3000
 $= 27000$ bytes

So, Data size of 10th packet = $28939 - 27000$
 $= 1939$ bytes.

IV. offset value of 2nd packet = $\frac{3000}{8} = 375$.