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Sec; 23

CSE421 Assignment-01

Fall-2024 (B)

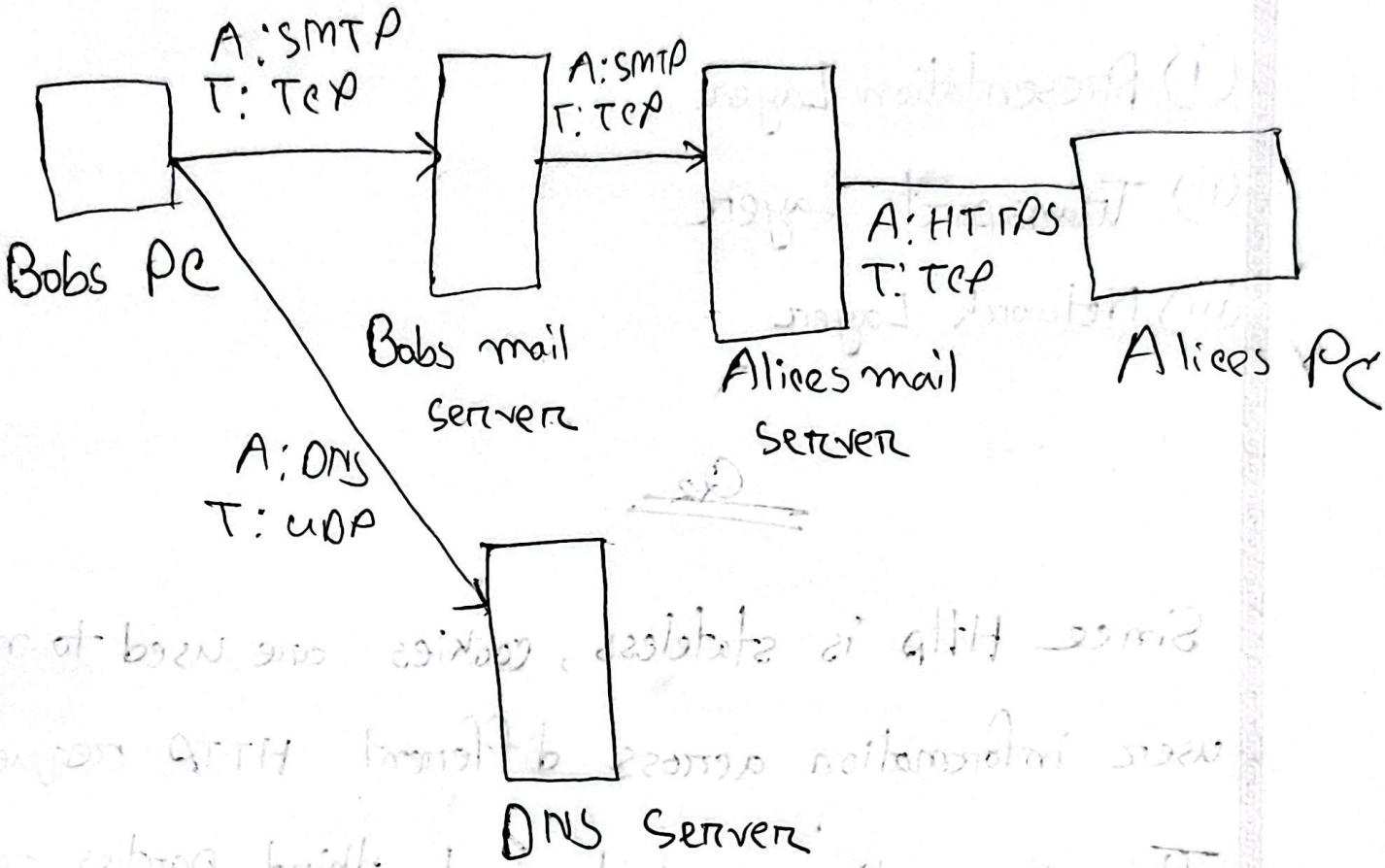
Q1

(i) Presentation Layer
(ii) Transport Layer
(iii) Network Layer

Q2

Since Http is stateless, cookies are used to maintain user information across different HTTP requests. Through cookies, websites and third parties can identify users, recall their activities, and display personalized advertisements. That is how social media platform knew about my choices.

Q3


A: SMTP
T: TCP
A: SMTP
T: TCP
A: HTTPS
T: TCP
Bobs PC
Bobs mail server
Alices mail server
Alices PC
A: DNS
T: UDP
DNS Server

Q4

www.gamingforall.com

200.10.20.7

Records:

1. (gamingforall.com, 200.10.20.7, A)
2. (gamingforall.com, dns.gamingforall.com, NS)
3. (gamingforall.com, www.gamingforall.com, CNAME)
4. (gamingforall.com, mail.gamingforall.com, MX)

Q5

Each TCP has Source Ip, Source port, Destination IP Destination Port. Both tabs use the same Source IP Destination IP/Port but each browser tab uses a different source port. That's how the server differentiates these requests. The destination ports will be the source ports used.

Tab 1: 49152, Tab 2: 49153

Q6

(i) TCP: 12ms

HTTP: 15ms

Return trip: 12ms

∴ RTT per object = 12 + 15 + 12 = 39ms

∴ total RTT = 39 × 18 = 702 ms

(ii) Each object = 12 × 8 = 96 Mb

server rate = 42 Mbps

Transmission time per object = $\frac{96}{42}$ = 2285.7ms

∴ Total transmission time = 2285.7 × 18

= 41,143 ms

Q7

(i) CSE Proxy hit:

Time = CSE LAN delay = 35ms

Bracu Proxy hit:

Time = CSE LAN + BracuLAN = 35 + 50 = 85ms

Origin Server hit:

Time = CSE LAN + Bracu LAN + Access + Internet delay

= 35 + 50 + 200 + 300 = 585

∴ Average = 0.5 (35) + 0.25 (85) + 0.25 (585)

= 185ms

(ii) Since a device from CSE department has just visited xyz.com, the webpage is now cached in the CSE depatchment's proxy server.

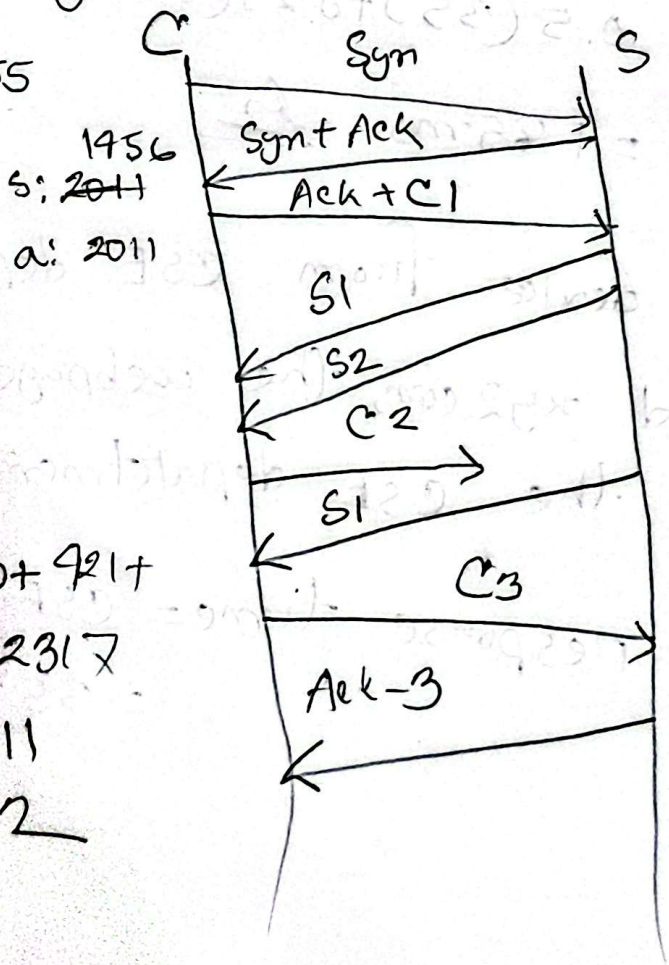
∴ PC A's response time = CSE LAN delay

= 35ms

Q8

(i) Server resends S1 because it never got an ACK for that segment. When the client recieves the retransmitted S1 it will accept it and advance its next-expected byte, sending Ack = 2010 + 220 = 2230. Any previously discarded out of order S2 will be ignored and must be resent by the server.

(ii)



S = 1456 + 220 + 421 + 220 = 2317

a: 2011 + 111 = 2122

Ans:
S = 2317
a: 2122

(iii) initial rwnd = 10,000 bytes.

after C3, data = 320 + 111 + 260 = 691

S rwnd = 10000 − 691 = 9309 bytes.

Ans