

CSE 421

Assignment - 1

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Sec : 23

Ans no: 1

When R1 forwards the packet (so R1 → Email Server):

- Source IP: (PC1's IP, unchanged)
- Destination IP: 3 (Email Server's IP, unchanged)
- Source MAC: B (R1's outgoing interface)
- Destination MAC: C (Email Server's MAC)
- Source Port: Random ephemeral port (e.g., 49152 - 65535)
- Destination Port: 25 (SMTP) - Since Email Server.

Ans no: 2

Action	HTTP Method	Explaton	Task
①. Upload new assignment	Post	Creates new resource on the Server.	Access via www.univers
②. Update submitted assignment	PUT	Replaces/updates an existing resource entirely (idempotent).	Access via university.ed (without www)
③. Delete mistakenly uploaded file	DELETE	Removes the resource from the server.	
■ Explanation:	PUT is used when the client wants to update an existing resource with new content. It is idempotent, meaning sending the same update multiple times produces the same result.		

Ans no: 3

Task

Access via  
www.university.edu

DNS Record

A Record

Purpose

Maps the domain  
name  
www.university.edu  
to its IP  
address (IPv4)

Access via  
university.edu  
(without www)

CNAME record

Maps university.  
edu as an alias  
for www -  
university.edu,  
so both point  
to the same site

Ans no: 4

Problem: Website not ranking high initially.

Cause: Site didn't use HTTPS → not considered secure by search engines.

Security improvement: Added SSL/TLS certificate (HTTPS).

Search engines (e.g., Google) rank HTTPS websites higher.

Ans no: 5

Demultiplexing fields:

- Source IP, Destination IP, Source Port, Destination port (used by the Transport layer to distinguish streams).

Out-of-order segments: Sequence =  
4, 2, 5, 1, 3

→ Application layer gets them in order: 1, 2, 3, 4, 5

Ans. no: 6

Q

Cache stored on March 16 with TTL = 5 days → expires on March 21.

Request made on March 18 → still valid.

□

Action: Proxy Server serves the cached copy (no new request to the Origin Server).

□

Explanation:

This saves bandwidth (no duplicate data transfer) and improves efficiency (faster response, reduced server load).

Ans no: 7

Given:

- DNS lookup time = 60 ms
- Non-persistent connection
- 15 objects (10 of 3mb, 5 of 7MB)
- Total RTT delay = 1200 ms
- Server speed = 100 Mbps

① Find single RTT

For non-persistent: each object needs 2 RTTs (1 for TCP setup + 1 for request/response).

Total RTTs for  $15 \times 2 = 30$  RTTs.

$$30 \times (\text{RTT single}) = 1200 \text{ ms}$$

$$\text{RTT single} = \frac{1200}{30} = 40 \text{ ms}$$

$$\text{Total data} = 103 + 57 = 30 + 35 = 65 \text{ MB}$$

$$65 \text{ MB} = 658 = 520 \text{ Mb}$$

$$\text{Transmission Time} = \frac{520}{100} = 5.2 \text{ seconds}$$

$$= 5200 \text{ ms}$$

$$200000 \text{ ms} = 200 \text{ TTR Total}$$

$$294 \text{ Mb} = 5592 \text{ ms}$$

$$\text{TTR slant band } 3$$

about 100 ms transmission time

$$25000 \text{ ms}$$

$$\text{Total RTT} = 100 + 25000 = 25100 \text{ ms}$$

$$25000 \text{ ms} = (\text{slant TTR}) \times 8$$

$$25000 \text{ ms} = \text{slant TTR}$$

Ans no: 8

Given:

- Client ISN = 0876
- Server ISN = 5432
- Client RWND = 8000 bytes
- Server RWND = 16000 bytes
- Segments:

From	To	Name	Data	Lost
Client	Server	C1	645	No
Server	Client	S1	687	Yes
Server	Client	S2	586	No
Server	Client	S3	652	No
Client	Server	Ack-1	-	No
Server	Client	S1(retransmit)	687	No
Client	Server	Ack-2	-	No

- Client sent C1 (645 bytes).
- Next byte expected by server =  $9876 + 645 + 1 = 10522$

ACK-1:

- Seq = Server's ISN + 1 = 5433 (assuming handshake done)
- Ack = 10522

ACK-2

Client RWND = 8000 bytes.

One segment = 645 bytes

S1:

Server ISN = 5432

After sending S1 retransmission = 687 bytes

$$\therefore \text{Next Sn} = 5432 + 1 + 687 = 6120$$

(Ans)