Assignment - 1

Name: Kazi Raiyan Ahmed

ID : 22299181

Section: 23

Course : CSE421

Answer to the question-1

a) 1. Data Link

2. Physical

3. Presentation

4. Transport

5. Session

6. Network

7. Application

∴ sequence; → $2 → 1 → 6 → 4 → 5 → 3 → 7$.

b) Not in syllabus.

c) Given,

Access link speed = 123 Mbps

Lan link speed = 1023 mbps

Server uploads 40 object, each 40mb

∴ TI = (40×4) = 160 mbps

∴ Lan utilization = $\left(\dfrac{160}{1023}\right) \times 100\%$

= $\boxed{15.64}\%$

∴ Access link utilization = $\left(\frac{160}{123}\right) \times 100\%$.

= $\boxed{130.08\%}$

We can see that, access link utilization is 130.08%. which is creating bottleneck and over utilized. So adding a proxy server would help significantly.

d) If we delete the "Date" field in the HTTP Response/Request header caching mechanisms will fail as we can not determine the age of cached content and cache expiration policies cannot be enforced and conditional get requests might not work properly.

a) **IMAP** is better than POP3 for a very slow internet connection on a mobile phone. Because, IMAP downloads only the email headers at first, then if needed full body of the specific email can be downloaded later. On the other hand, POP3 download all new emails at once which can be extremely time consuming for a slow internet connection. So, we can say than IMAP would be better.

b) This is possible because of **HTTP cookies**. When I first visit daraz.com and add items without logging in, the server creates a session and send cookie to the browser. When, we visit the website few days later, the browser sends the cookie back to the server

with each request. This cookie persists across the session until expires.

③① Phonte's PC's RTT to fetch IP address = (2×44) ms

$$= \boxed{88} \, ms$$

(Ans)

⑪ from A,

ONS RTT = 88 ms

total object = 28

server RTT = (2×89) = 178 ms

∴ total RTT = 88 ms + 2×178 ms × 28

$$= 88 + (356 \times 28) \, ms$$

$$= \boxed{100\,56} \, ms$$

(Ans)

(iii) Given;

total observed time = 19988 ms

∴ total RTT = 100 56 ms

∴ total transfer time = (19988 - 10056) ms

= 9932 ms

∴ total data size = (28 × 24 × 8) Mb

= 5376 mb

∴ $9932 = \dfrac{5376}{X} \times 1000$

$\Rightarrow X = \dfrac{5376000}{9932}$ mbps

= $\boxed{541.28}$ Mbps.

Answer to the question-3

5) Three repeated acknowledgement for same segments means a segment was lost and receiver keeps sending acknowledgement of the last correctly received segment. This initialize the fast retransmits the missing segment from the sender. Thus, three repeated acknowledgements for the same segment allows some time to be saved.

(Ans)

C)

① For 4th Data Segment,

$$\therefore \text{sequence number} = 9429+1+(889 \times 3)$$

$$= \boxed{12097}$$

$$\therefore \text{ACK number} = 8484+1+(235 \times 4)$$

$$= \boxed{9425}$$

(Ans)

Given,

Client ISN = 8484, RWND = 1000

Server ISN = 9429

RWND = 23080

HTTP Request size = 235 bytes

Data segment size = 889 bytes

(ii) For client to server 11th HTTP request;

∴ sequence number = 8484+1 + (10×235)

$$= \boxed{10835}$$

∴ ACK number = ~~9460420~~ 9429+1 + (8×889)

$$= \boxed{16542}$$ [∵ Because 9th segment got lost]

(Ans)

(iii) Given,

Initial RWND of client = 10005 bytes

first 5 segments were processed by client

9th segment got lost; so, 10, 11, 12, 13th segments will be discarded.

∴ only 6,7,8 segments left to processed

∴ buffer data size = (3×889) bytes

$$= 2667 \text{ bytes}$$

∴ Client RWND at 13th segment = (10005-2667) bytes

$$= \boxed{7338} \text{ bytes} \quad \text{(Ans)}$$