Ans to the que NO: 1

a) Data link layer is responsible for hop-to-hop delivery. In hop-to-hop delivery, it moves the frames between two connected node. switch-to-switch, router-to-router where host-to-host delivery happens between the source and destination hosts which is a logical communication. Again hop-to-hop uses the MAC address and Host-to-Host uses the IP-adress.

b) When the play is pressed on Iron Man 4 at www.cinema... the page fetches a DNS for the video servers address. The the CDN looks at the users network location and how busy the servers are. It then picks a server close to the user. DNS gives the user that server IP address. The users app connects to that nearby server and strats streaming. If the video is not there yet, the server gets it from the main site and keeps a copy. The DNS answer/response expires quickly so, if things change, the next lookup can send user to a better server.

c) In client server, the server is the only original source of the file. only one fixed uploader keeps all the copies, so time scales up with the user count. On the other hand, in P2P the server only needs to seed once. Here every new user becomes an additional uploader after receiving pieces, so total supply scales with demand, keeping the growth distribution time much slower.

d) 40% origin server
20% proxy server one
40% proxy server two

LAN delay = 50 ms

Access delay = 44 ms

Internet delay = 3.05s

Delay to origin server = $\frac{50}{1000} + \frac{44}{1000} + 3.05$ = 3.144 s

delay to proxy one = 50 ms = 0.05 s

delay to proxy two = 50 + 44 ms = 94 ms = 0.094 s

Total delay = $0.4 \times 3.144 + 0.2 \times 0.05 + 0.4 \times 0.094$

= 1.31 s

Ans to the que NO:2

a) I did not see my past searches because the website used a session cookie. A session cookie ends when the user close the browser or after some time. So by 6 pm the cookie was gone and the server could not remember my searches. This also occurs when user clears cookies or blocks cookies

b) IMAP is better on a mobile phone. It keeps emails on the server and sync across all devices. It also helps to fetch headers first and use less data. where POP3 downloads mail to one device and often removes it from the servers. So it does not sync well.

c)

1) RTT for each is 26 ms

RTT for Saifs PC = 2×2×26 = 104 ms

II) Each object takes: 39 ms

Server preparation: 4 ms

Download = 215 ms

Total RTT = $30 \times 2 = 60$ RTT $\times 39 = 2310$ ✓

III

RTT = $2 \times 39 = 78$ ms

server processing = 4 ms

Download time = 215 ms

Per object total = $78 + 4 + 215 = 297$

For 30 objects = $297 \times 30 = 8910$ ms

Total page load = DNS + 8910 ms

$= 104 + 8910 = 9014$ ms
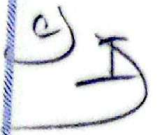
Ans to the que.No: 3

a) This is the start of closing a TCP connection.
The client checks FIN flag as true to send let
the server know that they have finished their work and
ACK flag from server shows the acknowledgement. This means
the session should end.

b) In UDP the destination port is usually a fixed service port.
Here the source port is temporary port chosen by the computer
when 3 tabs are opened, the systems picks a different
temporary port for each separate UDP connection to the
same server, so they cannot all be the same. So they
all have different source port.

c) I   sequence number : 11286
        Acknowledgement number : 2138

II) client gives total 1429 bytes to the app
after receives data from DS4 and DS5

So total $1429 + 99 + 201 = 1684$

DS-3 data lost $= \cancel{1429} \; 1684 - 300$

$\qquad\qquad\qquad = 1384$ Ans

III) Sequence number: 2138
Acknowledgement number: 11286