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F2

Ans 1. (a) There will be three connections since each connection transports exactly one request message and a response message.

(b) A persistent HTTP connection stays open after a request message. So, two distinct web pages can be sent over the same connection.

(c) Each TCP segment can only carry one request. It is not possible for the TCP segment to carry two distinct HTTP request message.

Ans 2. LAN speed = 10 Mbps

Access link speed = 1.5 Mbps

Average obj. size = 100000 bits

Avg. request rate = 15 requests/sec

(a) Time to transmit over LAN = $\dfrac{100000}{10000000}$ = 0.01 sec

Intensity over LAN = 15×0.01 = 0.15

Time to transmit over access link = $\dfrac{100000}{1500000}$ = 0.0667 sec

Traffic intensity over access link = 15×0.0667 = 1

(b) As ΔB over access link is 1, we will consider maximum delay of 1 minute.

(c) Hit rate = 0.4

Average access delay = $\dfrac{0.0667}{1 - 0.6 \times 1}$ = 0.16675 sec

Average response time = $0.16675 + 2$ = 2.16675 sec

Total response time = $0.4 \times 0 + 0.6 \times 2.16675$

= 1.3 sec

Ans 3. (a) $d_{prop} = \dfrac{m}{s}$ sec

(b) The transmission time of packet, $d_{trans} = \dfrac{L}{R}$ sec

(c) End-to-end delay. $= \left(\dfrac{L}{R} + \dfrac{m}{s}\right)$ sec

(d) At $t = d_{trans}$, the last bit of packet is just leaving host A.

(e) If $d_{prop} > d_{trans}$, then at $t = d_{trans}$, the first bit is in the link and has not reached Host B.

(f) If $d_{prop} < d_{trans}$, then at $t = d_{trans}$, the first bit has reached Host B.

(g) For $d_{prop} = d_{trans}$

$$\dfrac{m}{s} = \dfrac{L}{R}$$

$$m = \dfrac{L}{R} \times s$$

For given values, $m = \dfrac{100}{28 \times 10^3} \times 2.5 \times 10^8$

$m = 892857$ metres

$m = 892.857$ km