SOLUTION QUIZ-01 BSE-6C

QUESTION-01

1. Answer: c) Mobile Phone

- *Explanation:* End systems are devices like phones, computers, or IoT devices that directly communicate over a network. Routers and DSLAM are part of the infrastructure.

2. Answer: b) Queuing Delay

1. *Explanation:* Queuing delay occurs when packets wait in a router's queue due to congestion.

3. Answer: b) Resources are shared on demand.

- *Explanation:* In packet switching, resources like bandwidth and buffers are dynamically shared among all users.

TRUE/FALSE

i. False
ii. True

QUESTION-02

Segment 1:

Transmission Delay

The end system, ES1, pushes the 1,500 Byte packet onto the wire.

$$\frac{L}{R} = \frac{1500\ B}{2Mbps} = \mathbf{6\ ms}$$

Propagation Delay

Once the packet hits the wire, the propagation delay is how long it takes the bit to be sent over the wire to R1.

$$\frac{D}{S} = \frac{5000\ km}{2.5 * 10^8 ms} = \mathbf{20\ ms}$$

Segment 2:

Transmission Delay

It's the same **6 ms** since the packet size is still 1,500Bytes and the transmission rate is still 2Mbps

Propagation Delay

The distance between R1 and R2 is now 4,000 km so we'll see a decrease in propagation delay to 16 ms.

$$\frac{D}{S} = \frac{4000\ km}{2.5 * 10^8 ms} = \mathbf{16\ ms}$$

Segment 3:

Tranmission Delay

Again, no change in L or R so it's still **6 ms.**

Propagation Delay

The distance from R2 to ES2 is 1,000km so again we'll see a lower propagation delay,

$$\frac{D}{S} = \frac{1000\ km}{2.5 * 10^8 ms} = \mathbf{4\ ms}$$

Router Processing Delay

Just for the sake of completion, let's say the router vendor told us the router processing delay is 5 ms. So any packet going through R1 or R2 will automatically incur a 5 ms delay for packet processing.

Overall End-to-End Delay

- Segment 1 delay = 26 ms
- Segment 2 delay = 22 ms
- Segment 3 delay = 10 ms
- Router Processing = 10 ms

Total End-to-End Delay = 68 ms