

Multiple Choice Questions

1. Which of the following is not a network edge device?
 - (a) PC
 - (b) Smartphones
 - (c) Servers
 - (d) Switch

2. A set of rules that governs data communication is called ...
 - (a) Protocols
 - (b) Standards
 - (c) RFCs
 - (d) None of the mentioned

3. OSI stands for
 - (a) open system interconnection
 - (b) operating system interface
 - (c) optical service implementation
 - (d) none of the mentioned

4. Which of the following is false with respect to UDP?
 - (a) Connection-oriented
 - (b) Unreliable
 - (c) Transport layer protocol
 - (d) All of the mentioned

5. Application layer protocol defines
 - (a) types of messages exchanged
 - (b) message format, syntax and semantics
 - (c) rules for when and how processes send and respond to messages
 - (d) all of the mentioned

6. Which of the following is true with respect to TCP
 - (a) Connection-oriented
 - (b) Process-to-process
 - (c) Transport layer protocol
 - (d) All of the mentioned

7. The 4-byte IP address consists of
- (a) network ID
 - (b) host ID
 - (c) both (a) and (b)
 - (d) none of the mentioned
8. The full name of SMTP is
- (a) Simple Mail Transfer Protocol
 - (b) Simple Message Transfer Protocol
 - (c) Simple Mail Transmission Protocol
 - (d) Simple Message Transmission Protocol

Short Answer Questions

Question 1

Compare packet switching and circuit switching in terms of their operation and performance.

Question 2

Draw the hierarchy of servers of the DNS database system. Describe briefly the role of each type of servers.

Question 3

Consider a packet of length L which begins at end system A and travels over three links to a destination end system. These three links are connected by two packet switches. Let d_i , s_i , and R_i denote the length, propagation speed, and the transmission rate of link i , for $i = 1, 2, 3$. The packet switch delays each packet by d_{proc} . Assuming no queuing delays, in terms of d_i , s_i , R_i ($i = 1, 2, 3$), and L , what is the total end-to-end delay for the packet? Suppose now the packet is 1,500 bytes, the propagation speed on all three links is $2.5 \cdot 10^8$ m/s, the transmission rates of all three links are 2 Mbps, the packet switch processing delay is 3 msec, the length of the first link is 5,000 km, the length of the second link is 4,000 km, and the length of the last link is 1,000 km. For these values, what is the end-to-end delay?

Question 4

Suppose N packets arrive simultaneously to a link at which no packets are currently being transmitted or queued. Each packet is of length L and the link has transmission rate R . What is the average queuing delay for the N packets?

Note: "Short Answer" does not necessarily means that an answer will be very short. It means that the answer should be concise and should not be an essay.