

Lecture 1 - Layers of the Internet Quiz ANS

1. Which of the following is a primary challenge related to the "Federation" of the Internet?

- A) The speed of light limits data transfer
- B) There is no single operator, requiring cooperation among rivals
- C) Hardware components fail frequently
- D) Wireless signals are prone to interference

ANS: B

2. The Internet is "Best-Effort" at Layer 3. What does this mean?

- A) The network guarantees 100% delivery of all packets
- B) The network will tell you immediately if a packet fails to arrive
- C) The network tries its best to deliver packets but makes no guarantees
- D) The network prioritizes important emails over video streaming

ANS: C

3. Which organization is responsible for standardizing and publishing Internet protocols in RFC documents?

- A) IEEE (Institute of Electrical and Electronics Engineers)
- B) ISO (International Organization for Standardization)
- C) IETF (Internet Engineering Task Force)
- D) W3C (World Wide Web Consortium)

ANS: C

4. In the context of protocols, what does "Syntax" refer to?

- A) The actions taken in response to a message
- B) The format of messages (what the 1s and 0s mean)
- C) The speed at which messages are sent
- D) The physical medium used to send messages

ANS: B

5. Layer 1 (Physical Layer) is responsible for:

- A) Moving bits across space using physical technology
- B) Connecting local networks together
- C) Ensuring reliable delivery of data
- D) Breaking large data into smaller packets

ANS: A

6. What is the main function of Layer 4 (Transport Layer)?

- A) To convert digital signals into analog waves
- B) To build reliable delivery (e.g., re-sending lost packets) on top of Layer 3

- C) To physically connect two machines with a wire
- D) To route packets between different towns

ANS: B

7. Why is Abstraction (or Modularity) considered powerful in Internet design?

- A) It allows all layers to be combined into one fast software block
- B) It ensures that a change in Layer 2 protocols does not affect other layers
- C) It guarantees that hardware never fails
- D) It eliminates the need for physical wires

ANS: B

8. In the failure analysis example, if a system has 50 components each working 99% of the time, what is the approximate chance that at least one fails?

- A) 1%
- B) 10%
- C) 39.5%
- D) 99%

ANS: C (The probability that all 50 components work is: $0.99^{50} \approx 0.605$. So the probability that at least one component fails is: $1 - 0.605 \approx 0.395$)

9. What distinguishes a Host from a Switch or Router?

- A) Hosts forward packets; Switches generate data
- B) Hosts are end machines (like laptops); Switches forward packets toward destinations
- C) Hosts operate at Layer 1; Switches operate at Layer 4
- D) Hosts are only for receiving; Switches are only for sending

ANS: B

10. Which of the following is true about Layer 3 (The IP Layer)?

- A) It strictly uses only wired links
- B) It connects many local networks to form a global network
- C) It handles the physical voltage on the wires
- D) It guarantees the order of packet arrival

ANS: B

11. What term is used to describe a stream of packets exchanged between two endpoints at Layer 4?

- A) Flow (or Connection)
- B) Circuit
- C) Voltage
- D) Spectrum

ANS: A

12. Which of the following is a characteristic of Layer 3 (Best-Effort service)?

- A) Packets are guaranteed to arrive in order
- B) The network notifies you if a packet is lost
- C) Packets are limited in size and could get lost, reordered, or corrupted
- D) The network uses encryption to protect all packets

ANS: C