1. Which layer of the OSI model is responsible for establishing, maintaining, and terminating connections between devices?
a) Application layer
b) Transport layer
c) Network layer
d) Data link layer

Answer: b) Transport layer
Explanation: The transport layer in the OSI model is responsible for ensuring end-to-end communication by establishing, maintaining, and terminating connections between devices. It provides mechanisms for reliable data transfer and flow control.

2. Which transmission media is an example of guided media?
a) Radio waves
b) Fiber optic cables
c) Microwave
d) Infrared

Answer: b) Fiber optic cables
Explanation: Guided media refers to transmission media that provide a physical path for signals to travel. Fiber optic cables are an example of guided media as they guide light pulses through optical fibers.

3. Which type of switching establishes a dedicated communication path before the actual data transfer?
a) Circuit switching
b) Packet switching

c) Message switching
d) Datagram switching

Answer: a) Circuit switching
Explanation: Circuit switching establishes a dedicated communication path between source and destination before data transfer begins. This path remains reserved for the duration of the communication session, ensuring constant bandwidth availability.

4. Which transmission media is an example of unguided media?
a) Twisted pair cable
b) Coaxial cable
c) Satellite communication
d) Optical fiber

Answer: c) Satellite communication
Explanation: Unguided media, also known as wireless or unbounded media, refers to transmission media where signals propagate freely without the use of a physical conductor. Satellite communication is an example of unguided media as it relies on radio waves to transmit signals between Earth stations and satellites.

5. Which switching technique does not require the establishment of a dedicated path before data transfer?
a) Circuit switching
b) Packet switching
c) Virtual circuit switching
d) Message switching

Answer: b) Packet switching
Explanation: Packet switching does not require the establishment of a dedicated path before data transfer. Instead, data is divided into packets, which are then routed independently through the network based on destination addresses, allowing for efficient utilization of network resources.

6. Which layer of the OSI model is responsible for addressing, routing, and forwarding of data packets?
a) Transport layer
b) Data link layer
c) Network layer
d) Physical layer

Answer: c) Network layer
Explanation: The network layer in the OSI model is responsible for addressing, routing, and forwarding data packets between different networks. It determines the optimal path for data transfer and ensures delivery to the correct destination.

7. Which type of transmission impairment is caused by signal attenuation and distortion?
a) Thermal noise
b) Interference
c) Delay distortion
d) Channel capacity limitation

Answer: c) Delay distortion
Explanation: Delay distortion refers to the distortion of signals caused by variations in propagation delay, leading to overlapping or smearing of signal pulses. This impairment is

often caused by signal attenuation and distortion in the transmission medium.

8. Which switching technique involves the temporary creation of a virtual communication path for data transfer?
a) Circuit switching
b) Packet switching
c) Datagram switching
d) Virtual circuit switching

Answer: d) Virtual circuit switching
Explanation: Virtual circuit switching involves the temporary creation of a virtual communication path between source and destination devices for data transfer. This path is established dynamically and remains active for the duration of the communication session, providing a connection-oriented approach similar to circuit switching.

9. Which performance metric measures the amount of time it takes for a signal to travel from the sender to the receiver?
a) Bandwidth
b) Latency
c) Jitter
d) Throughput

Answer: b) Latency
Explanation: Latency measures the delay experienced by a signal as it travels from the sender to the receiver. It includes factors such as propagation delay, transmission delay, and processing delay, and is a critical performance metric in communication systems.

10. Which layer of the OSI model is responsible for ensuring error-free transmission of data over the physical medium?
a) Data link layer
b) Physical layer
c) Transport layer
d) Network layer

Answer: a) Data link layer
Explanation: The data link layer in the OSI model is responsible for ensuring error-free transmission of data over the physical medium. It provides mechanisms for error detection, correction, and flow control, as well as addressing and framing of data packets.