1. Which of the following is NOT a common optical network topology?
a) Ring
b) Mesh
c) Star
d) Linear

Answer: d) Linear

Explanation: Optical networks commonly employ ring, mesh, and star topologies for their infrastructure. A linear topology, while possible, is less common due to its limited redundancy and scalability compared to other topologies.

2. What is the primary function of SONET (Synchronous Optical Networking)?
a) To provide wavelength division multiplexing
b) To synchronize data transmission over optical fibers
c) To amplify optical signals
d) To regulate network traffic

Answer: b) To synchronize data transmission over optical fibers

Explanation: SONET is a standardized protocol used in optical networks to synchronize the transmission of data over fiber optic cables, ensuring reliable and efficient communication.

3. Which optical amplifier is based on stimulated Raman scattering?
a) EDFA (Erbium-Doped Fiber Amplifier)
b) SOA (Semiconductor Optical Amplifier)
c) Raman amplifier
d) WDM amplifier

Answer: c) Raman amplifier

Explanation: Raman amplifiers utilize stimulated Raman scattering to amplify optical signals in fiber optic communication systems. Unlike EDFA, which uses erbium-doped fiber, Raman amplifiers rely on the inherent properties of the fiber to achieve amplification.

4. What does WDM stand for in the context of optical networks?
a) Wavelength Division Multiplexer
b) Wideband Data Modulation
c) Wireless Data Management
d) Waveform Distribution Method

Answer: a) Wavelength Division Multiplexer

Explanation: WDM (Wavelength Division Multiplexing) is a technology used in optical networks to combine multiple optical signals onto a single fiber optic cable by assigning each signal a different wavelength.

5. Which type of optical network is characterized by the absence of powered active elements?
a) Passive Optical Network
b) Active Optical Network
c) Hybrid Optical Network
d) Dynamic Optical Network

Answer: a) Passive Optical Network

Explanation: A Passive Optical Network (PON) relies solely on passive components such as

splitters and combiners to distribute optical signals, without the need for powered active elements like amplifiers or switches.

6. Which component is commonly used to boost optical signals without converting them to electrical signals?
a) Photodetector
b) Laser diode
c) Optical amplifier
d) Optical switch

Answer: c) Optical amplifier

Explanation: Optical amplifiers, such as EDFA (Erbium-Doped Fiber Amplifier) and Raman amplifiers, are used to increase the power of optical signals directly in the optical domain, without the need for converting them to electrical signals.

7. What is the primary advantage of using WDM (Wavelength Division Multiplexing) in optical networks?
a) Increased security
b) Higher data rates
c) Reduced latency
d) Greater scalability

Answer: d) Greater scalability

Explanation: WDM allows multiple optical signals to be transmitted simultaneously over a single fiber optic cable by utilizing different wavelengths for each signal, thereby increasing the capacity and scalability of optical networks.

8. Which network protocol is commonly used for carrying voice and data traffic over optical networks?
a) TCP/IP (Transmission Control Protocol/Internet Protocol)
b) Ethernet
c) MPLS (Multiprotocol Label Switching)
d) ATM (Asynchronous Transfer Mode)

Answer: d) ATM (Asynchronous Transfer Mode)

Explanation: ATM is a network protocol commonly used for carrying voice, data, and video traffic over optical networks, providing efficient and reliable transmission of multimedia services.

9. What is the primary function of a passive optical splitter in a PON (Passive Optical Network)?
a) To amplify optical signals
b) To combine multiple optical signals into one
c) To distribute optical signals to multiple users
d) To convert optical signals to electrical signals

Answer: c) To distribute optical signals to multiple users

Explanation: Passive optical splitters are used in PONs to divide an incoming optical signal into multiple output signals, allowing for the distribution of optical signals to multiple end-users without the need for powered active elements.

10. Which type of optical amplifier is commonly used for long-haul communication networks?
a) Semiconductor Optical Amplifier (SOA)

b) Raman amplifier
c) Optical Pre-Amplifier
d) Erbium-Doped Fiber Amplifier (EDFA)

Answer: d) Erbium-Doped Fiber Amplifier (EDFA)

Explanation: EDFA (Erbium-Doped Fiber Amplifier) is commonly used in long-haul communication networks to amplify optical signals over extended distances, offering low noise and high gain performance suitable for large-scale optical transmission systems.

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