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Nokia Optical Networking Fundamentals

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Question: 244

What is the primary function of an Optical Multiplexer in Wavelength Division Multiplexing (WDM)?

A. To combine multiple wavelengths onto a single fiber
B. To split a single wavelength into multiple wavelengths
C. To amplify the optical signal
D. To filter out unwanted wavelengths

Answer: A

Explanation: The primary function of an optical multiplexer in a WDM system is to combine multiple wavelengths (or channels) onto a single optical fiber. This allows for the transmission of higher data rates by utilizing the wide available bandwidth of the fiber.

Question: 245
What is the purpose of the optical time-domain reflectometer (OTDR) in optical networks?

A. OTDR is used to measure the optical power of the signal at different points along the fiber.
B. OTDR is a technique for multiplexing multiple wavelengths onto a single fiber using WDM.
C. OTDR is used to locate and identify faults, splices, and other events along the length of an optical fiber.
D. OTDR is a method for compensating for chromatic dispersion in the optical fiber.

Answer: C

Explanation: The optical time-domain reflectometer (OTDR) is a valuable tool used in optical networks to locate and identify faults, splices, and other events along the length of an optical fiber. By analyzing the reflected light signals, the OTDR can provide information about the fiber's condition, including the location and nature of any issues, which is crucial for maintenance and troubleshooting.

Question: 246
Which of the following is a key advantage of using Wavelength Division Multiplexing (WDM) in an optical network?

A. Increased transmission capacity by utilizing multiple wavelengths
B. Reduced power consumption compared to single-wavelength systems
C. Simplified optical fiber installation and maintenance
D. All of the above

Answer: D
Explanation: WDM allows multiple wavelength channels to be transmitted over a single optical fiber, dramatically increasing the total data capacity. It also reduces the need for additional fiber infrastructure and simplifies network management and maintenance compared to deploying multiple independent fiber links.

Question: 247

Which of the following is a key component in Nokia's Photonic Service Engine (PSE) architecture?

A. Optical cross-connect (OXC)
B. Dispersion compensating module (DCM)

C. Reconfigurable optical add-drop multiplexer (ROADM)
D. Intelligent optical controller (iOC)

Answer: D

Explanation: The key component in Nokia's Photonic Service Engine (PSE) architecture is the intelligent optical controller (iOC). The iOC is a centralized, software-defined control system that manages and optimizes the performance of the optical network. It enables dynamic reconfiguration, wavelength allocation, and end-to-end service provisioning, allowing for efficient utilization of network resources and rapid response to changing traffic demands.

Question: 248

What is the primary purpose of an Optical Wavelength Selective Switch (WSS)?

A. To multiplex multiple wavelength channels onto a single fiber.
B. To amplify optical signals.
C. To selectively route or switch individual wavelength channels.
D. To convert between different fiber types.

Answer: C

Explanation: The primary purpose of an Optical Wavelength Selective Switch (WSS) is to selectively route or switch individual wavelength channels. It allows the network operator to dynamically control the flow of specific wavelength channels in an optical network.

Question: 249
Which of the following is a key characteristic of the Differential Phase Shift Keying (DPSK) modulation format?

A. It offers higher spectral efficiency compared to On-Off Keying (OOK).
B. It is more resilient to nonlinear effects in the fiber.
C. It provides better sensitivity and receiver performance.
D. All of the above.

Answer: D

Explanation: The Differential Phase Shift Keying (DPSK) modulation format offers several key advantages over On-Off Keying (OOK): higher spectral efficiency, better resilience to nonlinear effects in the fiber, and improved sensitivity and receiver performance. These characteristics make DPSK a popular choice for high-speed and long-haul optical transmission systems.

Question: 250

What is the role of the Optical Channel Transport Unit (OTU) in the OTN frame structure?

A. The OTU provides the payload area for transporting client signals over the optical network.
B. The OTU is responsible for the forward error correction (FEC) processing of the optical data.
C. The OTU implements the Optical Supervisory Channel (OSC) for control and management.
D. The OTU adds the necessary overhead and framing to the ODU for transmission over the optical fiber.

Answer: D

Explanation: The Optical Channel Transport Unit (OTU) is the outermost layer of the OTN frame structure, and its primary role is to add the necessary overhead and framing to the Optical Channel Data Unit (ODU) payload. The

OTU layer is responsible for incorporating functions like forward error correction (FEC), tandem connection monitoring, and other overhead information required for the reliable transmission of the optical data over the fiber-optic network.

Question: 251

How does a Raman pump work in the 1830 specific implementation?

A. The amplification is done simultaneously for all channels as they enter the board.
B. As the incoming signal power increase, the gain of the amplifier is reduced.
C. The pump light travels in the same direction of the signal, amplifying it while it flows in the fiber towards the following node.
D. The pump light travels in the opposite direction of the signal to be amplified, amplifying it while it arrives from the adjacent node.

Answer: C

Explanation:

In the 1830 implementation, the Raman pump uses a technique called co-propagation, where the pump light (which provides the energy for amplification) travels in the same direction as the signal. This setup is used to amplify the signal as it flows through the fiber towards the next node

Question: 252

Which of the following sentences about FlexGrid is false?

A. FlexGrid allows a more efficient channel spacing.
B. Channels in FlexGrid systems are allocated with a granularity of 27.5GHz.
C. FlexGrid systems use specific sets of boards. Old generation WDM systems need to be upgraded to support FlexGrid.
D. The FlexGrid is currently standardized by ITU-

Answer: B

Explanation:

This statement is false. In a FlexGrid system, the channels are allocated with a granularity of 6.25 GHz, not 27.5 GHz. This allows for more efficient use of the optical spectrum and better flexibility.

Question: 253

Which of the following statements is true about chromatic dispersion (CD)?

A. Different channels have different bandwidth and this causes different CD performances.
B. The fiber attenuation changes along the fiber, and when the light crosses these differences the CD takes place.
C. Different wavelengths propagate at different speeds within the same media and therefore different colors travel in the fiber with different speed.
D. The fiber attenuation introduces inter-channel interference.

Answer: C

Explanation:

Different wavelengths propagate at different speeds within the same media and therefore different colors travel in the fiber with different speed. This phenomenon is known as chromatic dispersion and causes light to spread out as it travels through the fiber over distance, leading to signal attenuation and distortion. The fiber attenuation does not introduce inter-channel interference, but it can cause attenuation of the signal. Different channels have different bandwidths, but this does not affect CD performance.

Question: 254

Which of the following applications is related to Wavelength Tracker tool?

A. Collecting logs related to possible issue affecting a wavelength path
B. Tracking the protection path for a specific wavelength
C. Tracing the end-to-end wavelength optical power
D. Correcting errors related to wavelength inconsistencies

Answer: C

Explanation:

The Wavelength Tracker tool is used for real-time tracking and monitoring of wavelength paths in an optical network. Its key function is to trace the end-to-end optical power of a particular wavelength. This aids in network troubleshooting and performance optimization.

Question: 255

What is the purpose of the validate step in the EPT design process?

A. During this step, the configuration available on the involved network elements is compared with the design provided byEP
B. This step is used to measure optical power performances over an existing network before making changes.
C. This step is optional and is useful to verify the network element layout before going through the commission step.
D. During this step, the run design action is triggered for network design consistency check and errors fixing.

Answer: A

Explanation:

In the EPT design process, the validate step is crucial to compare the actual configuration of network elements with the design provided by EPT (Engineering Planning Tool). This step ensures that the network has been set up correctly according to the design.

Question: 256

What is a degree-1 node?

A. A node with only one direction and therefore a terminal node
B. A node with only one express channel and therefore made of two sides

C. A node with only east and west sides without directions towards north and south
D. A node with one direction only and therefore used as In-Line-Amplifier (ILA)

Answer: A

Explanation:

A degree-1 node is a node that only has one direction, and it is therefore a terminal node. This means that the node only has one input and one output port. It does not have any other ports to connect to other nodes or fibers. This is a common feature of some optical transport networks, such as ring networks, where a degree-1 node serves as the endpoint of the ring.

Question: 257

What is the function of a pre-amplifier in an optical network?

A. Through the pre-amplifier, the optical signal is amplified at the receiver side after it travels along the fiber from another node.
B. Through the pre-amplifier, the optical signal is amplified at the transmitter side before it is sent to the line span.
C. Through the pre-amplifier, the optical signal is amplified both the receiver side and at the transmitter side.
D. Through the pre-amplifier, the optical signal is amplified within the node internally to recover internal losses due, for instance, to cascaded filters.

Answer: A

Explanation:

The main function of a pre-amplifier in an optical network is to amplify the optical signal at the receiver end after it has travelled along the fiber from the transmitter side. This ensures that the signal power is strong enough for detection at the receiver side.

Question: 258

What does it take to get connected to the NSP platform?

A. A browser and the NSP IP address; and from the landing page, the NSP application should be downloaded and launched.
B. A browser and the NSP IP address. Then, a browser plugin needs to be installed and the laptop rebooted before the NSP can be correctly reached.
C. A browser, the NSP IP address, and the credentials to access the web-based interface (WebUI).
D. The NSP package should be downloaded from the Nokia website and properly licensed for thespecific workstation to be used.

Answer: C

Explanation:

To get connected to the Nokia Service Platform (NSP) platform, you need a browser and the NSP IP address. Then, you need the credentials to access the web-based interface (WebUI) for the NSP platform. Once you have these, you

can access the NSP platform from a web browser.

Question: 259

Is it possible to mix PSS-24x and PSS-8x shelves In an SWDM configuration?

A. Yes, as both can be equipped within the same node
B. No, as they are not compatible and cannot be used within the same node
C. Yes, but the PSS-24X shelf must be configured as a master
D. Yes, but the PSS-8X shelf must be configured as a master

Answer: A

Explanation:

PSS-24x and PSS-8x are Nokia Photonic Service Switches that can be equipped within the same node. They have different capacities but can coexist in the same configuration.

Question: 260

What is the metro area network?

A. The metro area network is that portion of network that passes through a city to provide connections to several customers.
B. The metro area network is located between access and core domains.
C. The metro area network is made of OCS/SWDM nodes only, as no pure photonic nodes are used here.
D. The metro area network is located in between two access area networks and made of photonic nodes only (no OCS/SWDM nodes are used there).

Answer: B

Explanation:

A Metropolitan Area Network (MAN) typically spans a city or campus and is larger than a local area network (LAN) but smaller than a wide area network (WAN). It often serves as the link between access and core networks, aggregating traffic from multiple access networks and transporting it to the core network.

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