Exam : 642-321

Title : Cisco Optical SDH Exam

Ver : 09.26.07

QUESTION 1
For lasers with tightly controlled wavelengths, approximately how far apart are the centers of adjacent wavelengths when 100 GHz spacing is used in a DWDM system?

A. 0.4 nanometers
B. 0.6 nanometers
C. 0.8 nanometers
D. 1.2 nanometers
E. 1.6 nanometers

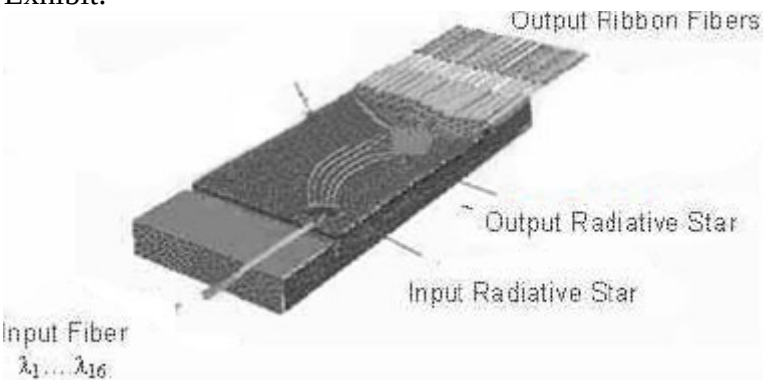
Answer: C

QUESTION 2
The dispersion of a non-zero dispersion shifted fiber is 6 ps/nm*km at 1550 nm and 10 ps/nm*km at 1610 nm.
What is the minimum dispersion compensation required if an L-Band DWDM signal travels through 200 km of fiber and has a dispersion of 1800 ps/nm?

A. None
B. -600 ps/nm
C. -200 ps/nm
D. +600 ps/nm
E. +600 ps/nm

Answer: C

QUESTION 3
Exhibit:



Which type of multiplexer is shown in the exhibit?

A. Thin film filter
B. Fiber Bragg Grating
C. Arrayed Wave Guide
D. Erbium fiber amplifier

Answer: C

QUESTION 4
In the OSNR model for EDFA amplifier, SNRout= 1/(1(SNRIN + FhvB/PIN), what does the SNRIN represent?

A. The signal to noise of the current optical amplifier.
B. The signal to noise of the previous amplifier of source.
C. The signal to noise introduced by the optical amplifier.
D. The accumulated noise to signal ratio of the optical channel.

Answer: B

QUESTION 5
How is a Thin filter fabricated?

A. The glass core is doped with an Erbium in periodic segments of the fiber.
B. Layers of high index and low index material are deposited on a glass substrate.
C. Thin layers of silica glass are place onto wafers to produce a prism-like effect.
D. Fiber is etched with an ultraviolet laser that is precisely spaced for specific wavelength filtering.

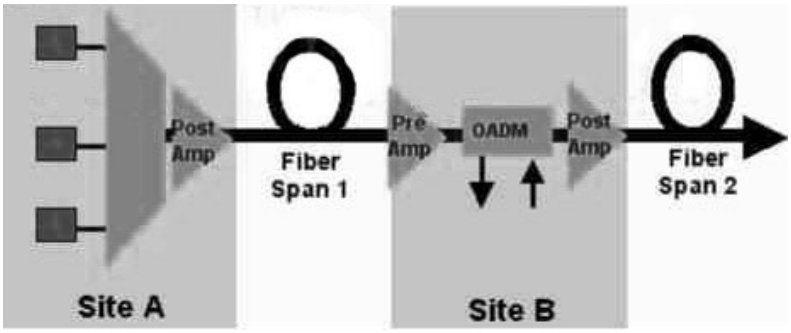
Answer: B

QUESTION 6
What are three factors that limit the maximum distance of an amplified optical signal without regeneration? Select three

A. Fiber dispersion
B. Signal attenuation
C. Transmitter power
D. Amplifier bandwidth
E. Receiver dispersion tolerance

Answer: A, B, E

QUESTION 7
Exhibit



When designing a CDWM system with multiple amplified spans, a pre-amp is needed Site B to _____. Choose three.

A. Offset the OADM loss at site B.
B. Overcome the high multiplexer loss at Site A.
C. Amplify signal levels after the high loss through Fiber Span 1.
D. Adjust add channels at Site B to be at the same level as the passthrough channels.
E. Ensure that the per channel power is higher than the minimum needed for the post-amp at Site B.

Answer: A, B, C
Note: Uncertainty.

QUESTION 8
If the dispersion of a given fiber is 17ps/nm*km at 1550 nm and zero at 1310 nm, then what is the accumulated dispersion of an ITU wavelength after it travels 200 km?

A. 0 ps/nm
B. 200 ps/nm
C. 340 ps/nm
D. 3400 ps/nm
E. More information is needed

Answer: D

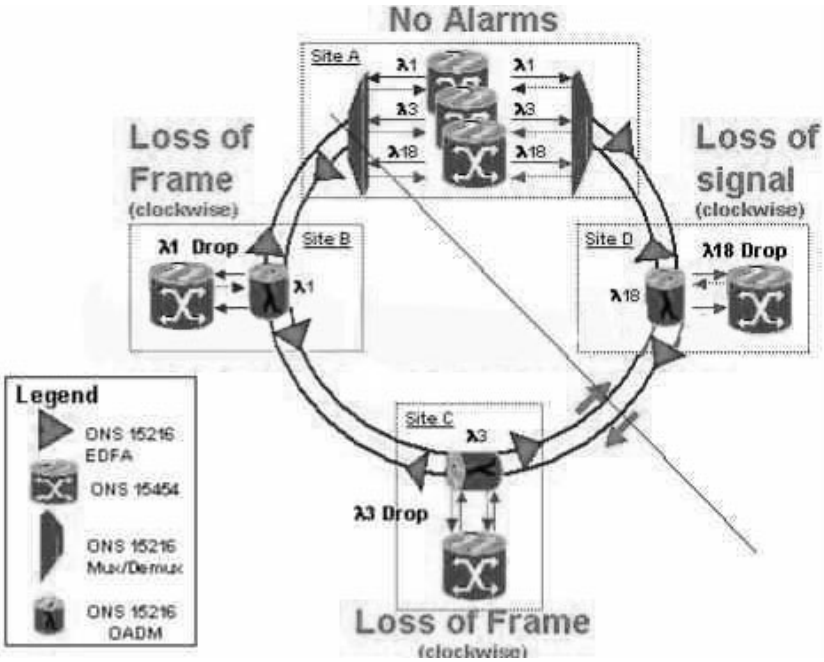
QUESTION 9
The ONS 15216 is a 32-channel system. The ONS 15216 OADMs are capable of adding and dropping one, two, or four channels.
How are the OADMs provisioned to add and drop specific channels?

A. The ONS 15216 OADM can be provisioned to add/drop one two, or four channels via Cisco Transport Manager (CTM).
B. The ONS 15216 OADM consists only of a four-channel module, and the number of ports utilized determines whether it is a one, two, or four channel OADM.
C. Three separate OADM modules are available for one, two, and four channels. The wavelengths to be dropped and added are programmable via Cisco Transport Manager

(CTM).
D. The ONS 15216 OADM consists only of a four-channel modul. Two-channel and four-channel support is available by stacking the single-channel module.
E. The ONS 15216 OADM is available in one, two, four channels. There are 32 single-channel OADM modules, 16 two-channel OADM modules, and 8 four-channel OADM modules.

Answer: E

QUESTION 10
Exhibit



The exhibit shows a 15454/15216 DWDM system and alarm indications.
What are two possible sources of trouble shown in the system? (Choose two.)

A. Fiber failure between Sites A and D.
B. EDFA failure at Site A (clockwise direction)
C. EDFA failure at Site C (clockwise direction)
D. 15217 multiplexer at Site A (counter-clockwise direction)
E. OADM pass-through (West "OUT") failure at Site (Clockwise)
F. Wavelengths 1 and 3 transmitter failures at Site A (clockwise direction)

Answer: B, F

QUESTION 11
What are two important considerations when using 2- or 4-channel 15216 OADMs?
Choose two

A. All "Add" channels require uniform power levels.

B. The flexibility of wavelengths per OADM is limited.
C. It is easier to balance "Pass-Through" and "Add" channels.
D. There is lower pass-through loss using multi-channel OADM.s
E. You can extract a single channel without dropping other channels.

Answer: A, E

QUESTION 12
A 2.5 Gb/s (OC-48 or STM-16) optical signal with a dispersion tolerance of 1200 ps/nm goes through fiber with 18ps/nm*km of dispersion.
How many 15216-DCU-350 equivalents are needed for enough compensation after traveling 100 km?

A. 0
B. 1
C. 2
D. 3
E. 4

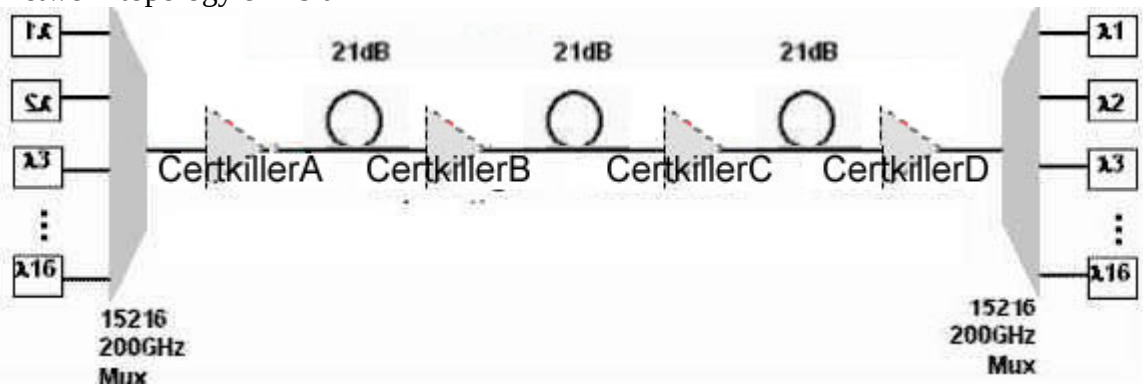
Answer: C

QUESTION 13
What are three relevant design considerations when using the 15216 EDFA? Choose three

A. dispersion
B. Optical SNR
C. Span attenuation
D. Four wave mixing
E. Receiver sensitivity

Answer: B, C, E

QUESTION 14
Network topology exhibit

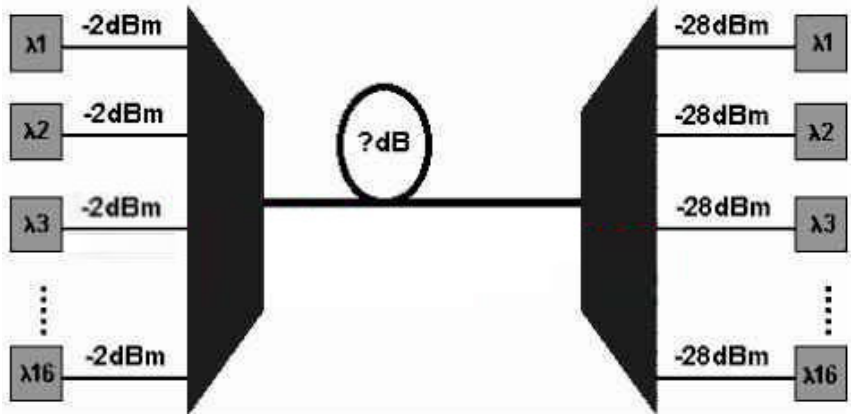


Give the following paramers:
Transmitter output (min): -2 dBm
Receiver input (min): -28 dBm
15216 Mux and Demux loss: 4.5 dB
16 channels maximum
In which sites shown in the exhibit could the 15216 EDFAs be placed to minimize the number of EDFAs needed`?

A. Locations Certkiller B and Certkiller C only
B. Locations Certkiller A, Certkiller B ,and Certkiller C only
C. Locations Certkiller A, Certkiller B ,and Certkiller D only
D. Locations Certkiller B, Certkiller C ,and Certkiller D only
E. Locations Certkiller A, Certkiller B , Certkiller C, and Certkiller D

Answer: A

QUESTION 15
Exhibit



What is the maximum allowable loss budget between the ONS 15216 Mux (left side) composite output and the ONS Demux (right side) composite input, with the optical values given in the exhibit?
(Assume the worst case loss of 4.5 dB for 15216 200 GHz Mux/Demux and ignore power penalties or extra margin.)

A. 15 dB
B. 17 dB
C. 21 dB
D. 26 dB
E. 27 dB

Answer: B

QUESTION 16
A VC-4-4c consists of _____.

A. An STM-16
B. Any four VC-4s
C. Four contiguous VC-4s
D. Four contiguous STM-4s
E. Two groupings of four VC-4s

Answer: C

QUESTION 17
Which timing mode is appropriate for an SDH NE that is adjacent to an SDH NE Bits-1 timing?

A. DUS
B. Line timing
C. Loop timing
D. Internal tiing
E. Through timing

Answer: B

QUESTION 18
What are two major differences between MS-SPRing and SNCP? Select two

A. In an MS-SPRING, all paths are protected.
B. MS-SPRing is always a high-order protections.
C. A low order circuit cannot be protected by an MS-SPRing.
D. There is no theoretical limit in the number of nodes in an SNCP ring.

Answer: A, B

QUESTION 19
What protection method is used in 4F MS-SPRing networks?

A. Each fiber has half of its capacity reserved for protection.
B. Two fibers carry their full capacities while the other two fibers are reserved for protection.
C. The signal is sent simultaneously in both directions around the ring. The receiver determines which fiber to listen to based on signal quality.
D. The signal is sent simultaneously in both directions around the ring. The transmitter determines which fiber has the working bit set for the receiver to acknowledge.

Answer: B

QUESTION 20
DRAG DROP

Your boss at Certkiller.com asks you to match compatible concepts in SONET and SDH terminology.

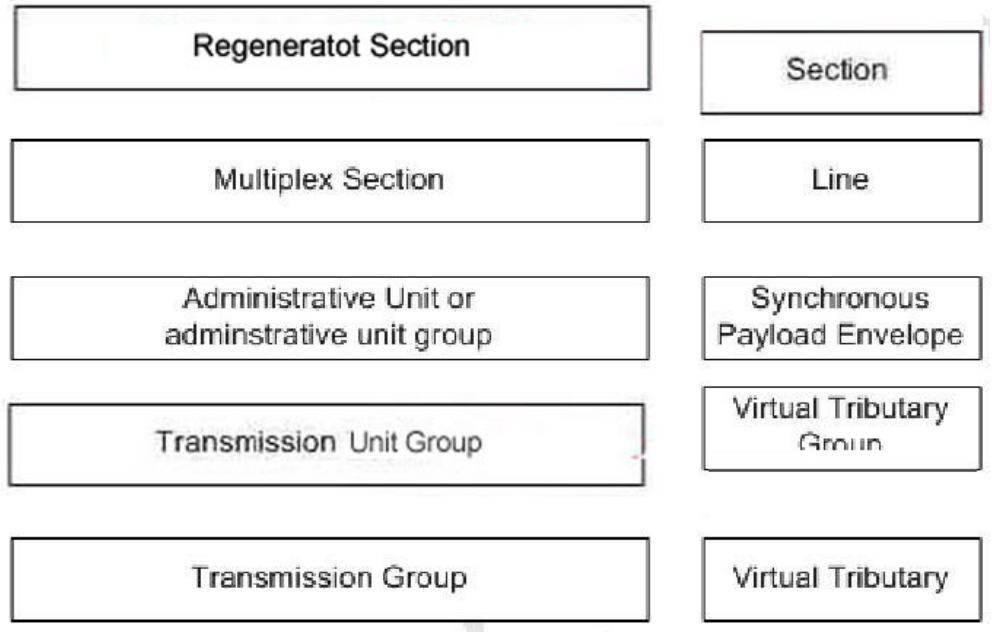
Regeneratot Section	*Place here*
Multiplex Section	*Place here*
Administrative Unit or adminstrative unit group	*Place here*
Transmission Unit Group	*Place here*
Transmission Group	*Place here*

Select from these

line | Section | Synchronous Payload Envelope | Virtual Tributary | Virtual Tributary Group

Answer:

Your boss at Certkiller.com asks you to match compatible concepts in SONET and SDH terminology.



QUESTION 21
What is a legitimate bandwidth matched pair?

A. DS-1;E1
B. DS-1;STM-1
C. OC-3;STM-1
D. STS-1;STM-1
E. OC-192;STM-192

Answer: C

QUESTION 22
How is SNCP and MS-SPRing traffic rerouted during a protection switch when a complete fiber cable cut occurs?

A. SNCP traffic is switched from the first node that receives the AIS. MS-SPRing traffic is rerouted from the first in the ring.
B. SNCP traffic is selected at the destination node in the ring. MS-SPRing rerouted from the originating node in the ring.
C. SNCP traffic is rerouted from the originating node in the ring. MS-SPRing traffic is rerouted from the originating node in the ring.

D. SNCP traffic is selected at the destination node in the ring. MS-SPRing traffic is rerouted from the last reachable node in the ring

Answer: D

QUESTION 23
In order to avoid misconnections due to a failed node in an MS_SPRing, Alrm Indication Signals (AISs) are sent on every channel normally terminating inthat node.
What is the name of this process?

A. Bridging
B. Switching
C. Squelching
D. Nodal bypass
E. Node failure insertion

Answer: C

QUESTION 24
What is an advantage of an externally modulated laser over a directly modulated laser?

A. Lower cost
B. Higher chirp
C. Easier to manufacture
D. Higher dispersion tolerance
E. Higher optical signal-to-noise ratio

Answer: D

QUESTION 25
SDH Code violations (CVs) totals in the PM tables are actually an accumulation of the number of _____.

A. J0 errors detected in a specified interval
B. Errors detected in a given Errored Seconds (ES)
C. Errors detected in a given Severly Errorod Seconds (SES)
D. Errors the encryption algorithm detects in a specified interval
E. Bit Interleaved Parity (BIP) errors detected in a specified interval

Answer: E

QUESTION 26
On an ONS 15454 node you can tunnel a(n)_____.

A. SDH circuit over a SONET network delivering it as an SDH signal.
B. SDH circuit over a SONET network delivering it as an SONET signal.
C. SONET circuit over a SDH network delivering it as an SDH signal.
D. SONET circuit over a SDH network delivering it as an SONET signal.

Answer: A

QUESTION 27
If node 2 is accepting line timing from node 1, node 2 will send _____ to node 1 as its SSM message.

A. AMI
B. DUS
C. ESF
D. PRS
E. MSC
F. B8ZS

Answer: B

QUESTION 28
Which two can be transported in one AU-4? Choose two.

A. 3 E3
B. 4 E4
C. 64 E1
D. 21 E1 and2 E3
E. 42 E1 and 2 E3

Answer: A, D

QUESTION 29
A customer has 20 E1s to add between far-end nodes in an SNCP ring. What type of circuit would you recommend?

A. L0-PATH circuits
B. HO-PATH circuits
C. 1:1 protections circuits
D. 1:N protections circuits
E. LO-PATH tunnel cirtuits

Answer: E

QUESTION 30
You are provisioning an E-1 circuit on an ONS 15454 MS-SPRing configuration and XC-VXL-10G card. Each VC-12 connections must also terminate via the VC-3

matrix.
How many VC-3 ports remain after this circuit is created, assuming no other circuits?

A. 92
B. 93
C. 94
D. 95
E. 95

Answer: C

QUESTION 31
The ML-series Ethernet card on the ONSD 15454 provides up to_____ active Q-in-Q instances per card

A. 512
B. 255
C. 1024
D. 4096

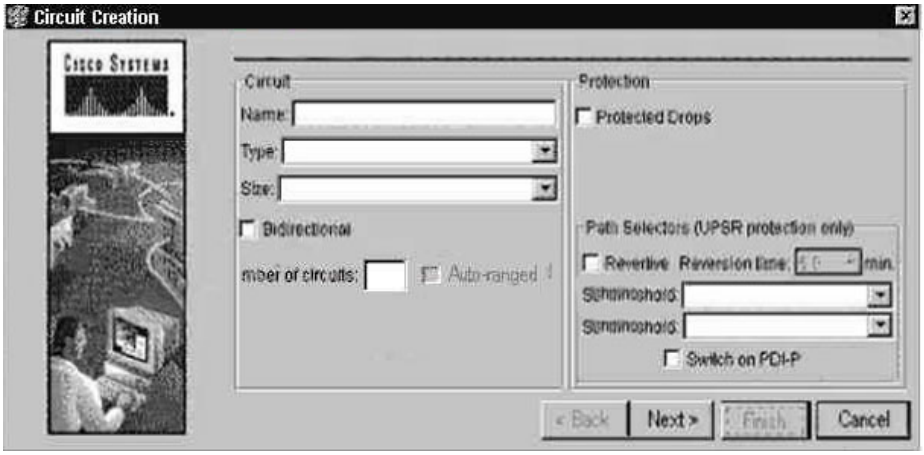
Answer: B

QUESTION 32
Which timing mode is most appropriate for an ONS 15454 that has lost its BITS-1 and optical references?

A. Line timing
B. Loop timing
C. Internal timing
D. Through timing
E. External timing

Answer: C

QUESTION 33
Exhibit



Within an ONS 15454, you are provisioning a circuit on an unprotected SNCP ring.
In the exhibit, which two must you configure? Choose two

A. Revertive
B. Circuit size
C. Circuit type
D. Bidirectional
E. Protected drops
F. Switch on PDI-P

Answer: B, C

QUESTION 34
What are two characteristics of dual-ring interconnect in SDH Networks? Choose two

A. It protects signals against node failures between rings.
B. It protects signals against node failure within a single ring.
C. It allows for traffic to be preempted when a ring switch occurs.
D. Traffic can be dropped and continued at interconnecting nodes.
E. It protects preemptible traffic from being dropped when a ring switch occurs.

Answer: A, D
Ref. CiscoPress "Optical Network Design and Implementation" p. 260

QUESTION 35
A customer has 2 E1s to add between far-end nodes in an SNCP ring.
What type of circuit should you recommend?

A. LO-PATH circuits.
B. HO-PATH circuits.
C. 1:1 protections circuits
D. 1:N protections circuits

E. LO-TUNNEL tunnel circuits

Answer: A

QUESTION 36
With R4.0, how many total DCC-R tunnel connections can each ONS 15454 support using the TCC+ card?

A. 10
B. 32
C. 64
D. 84
E. 96

Answer: B

QUESTION 37
What is the correct relative switching priority in an MS-SPRing ring (higher to lower)?

A. Signal fail, signal degrade, manual switch
B. Signal degrade, signal fail, manual switch
C. Protection lockout, manual switch, path AIS
D. Forced switch, manual switch, signal degrade
E. Protection lockout, manual switch, forced switch

Answer: A

QUESTION 38
Why is an STM-1 2F-MS-SPRing NOT feasible?

A. An equal amount of working and protect bandwidth is required.
B. DCC bandwidth is not large enough to handle K1/K2 processing.
C. Switch times would exceed 50 ms for an STM-1 MS-SPRing ring.
D. There is not enough bandwidth inan STM-1 ring to justiy MS-SPRing protection.

Answer: A

QUESTION 39
What is the difference between 1+1 and 1:1 protection switching?

A. 1+1 is based on APS, while 1:1 is based on IPS
B. 1:1 is used in SNCP switching, while 1+1 is used in MS-SPRing switching
C. 1+1 sends signals on Working and Protect paths, while 1:1 sends signals only on Working path.
D. 1+1 sends signals on Working path ONLY, while 1:1 sends signals on both Working

and Protect pathsl.

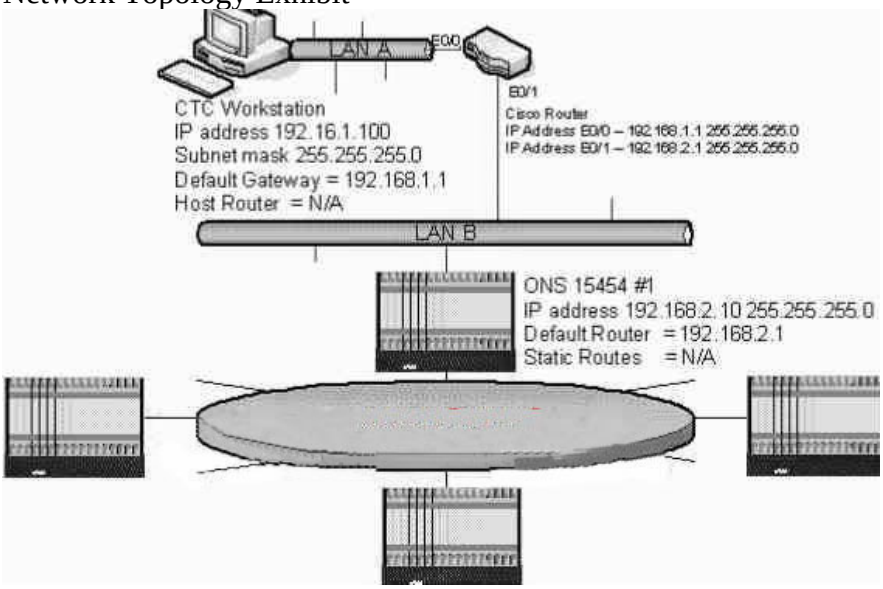
Answer: C

QUESTION 40
You are provisioning an E-1 circuit on an ONS 15454 SNCP configuration and XC-VXL-10G card.
How many total ports are used within the Low-Order matrix at the source node?

A. 0
B. 1
C. 2
D. 3
E. 4
F. 5

Answer: F

QUESTION 41
Network Topology Exhibit



In the DCN connection shown in the exhibit, all non-GNE nodes are located on different subnets from the GNE. There are no static routes or external OSPF on any elements. CTC Workstation and GNE have Router has its default gateway.
Can the CTC workstation see the entire SDH network?

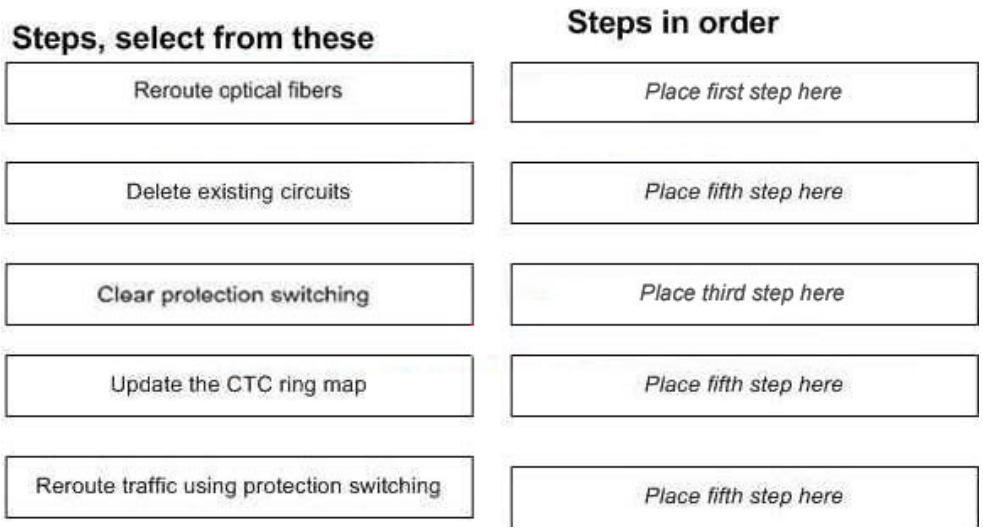
A. Yes, but only if the CTC's network address is a static route in the GNE.
B. Yes, because the GNE will only server as a proxy-ARP for elements on the same subnet.
C. Yes, but only fi the router's address is entered as a static route in the non-GNE elements.

D. Yes, because the GNE will server as a proxy-ARP for all elements, regardless of their subnets.

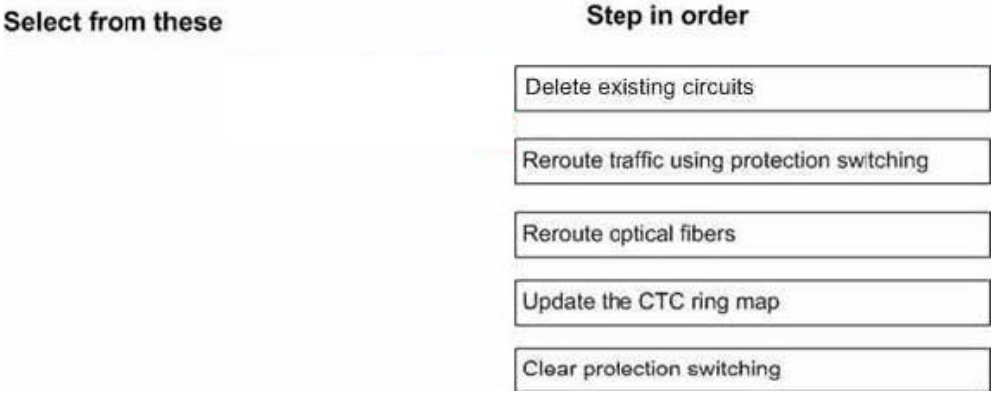
Answer: A

QUESTION 42
DRAG DROP

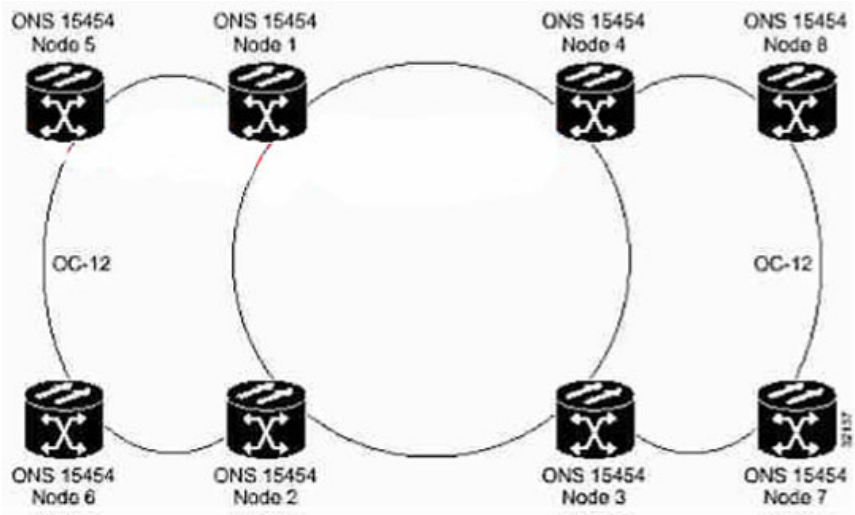
Your boss at Certkiller.com asks you to place the steps for removing a node from an existing MS-SPRing ring in the proper order.



Answer:



QUESTION 43
Network topology exhibit



As shown in the exhibit, a customer has several interconnected core rings. They want to create several virtual rings utilizing their STM-64 backbone (Nodes 1, 2, 3, and 4).
What do you recommend?

A. SNCP rings
B. MS-SPRing rings
C. 1:N protection on all core circuits
D. dual-ring interconnect with MS-SPRing rings

Answer: A

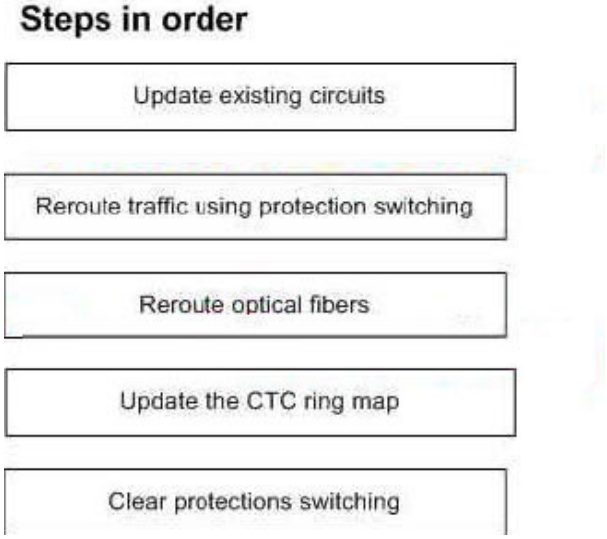
QUESTION 44
DRAG DROP

Your boss at Certkiller.com asks you to place the steps for ading a new node to an existing MS-SPRing ring in the proper order.

Regeneratot Section

Steps, select from these	Steps in order
Reroute optical fibers	*Place first step here*
Update existing circuits	*Place second step here*
Clear protections switching	*Place third step here*
Update the CTC ring map	*Place fourth step here*
Reroute traffic using protection switching	*Place fifth step here*

Answer:



QUESTION 45
A customer would like to create a 1:1 protection group with a SD2Ni-12 card.
Where should it be placed in the chassis?

A. Only Slots 6 or 12
B. Only slots 3 or 15
C. High or low speed slots
D. Directly adjacent to the working card
E. High-speed slots only (5/6 and 12/13)

Answer: D

QUESTION 46
What protocol enables Ethernet over SONET/SDH encapsulation interoperability between the G-series and ML-series Ethernet cards?

A. LEX
B. HDLC
C. GFP-F
D. PPP/BCP

Answer: A

QUESTION 47
Which three timing modes are supported on the ONSD 15454 shelf? Choose three

A. Line timing
B. Loop timing
C. Internal timing
D. Through timing

E. External timing

Answer: A, C, E

QUESTION 48
You are installing a Cisco ONS 15454 SDH in a service provider site. An E3 cable is being connected to a digital cross-connect system.
What is the maximum distance allowed between the two?

A. 225 ft
B. 450 ft
C. 655 ft
D. 900 ft

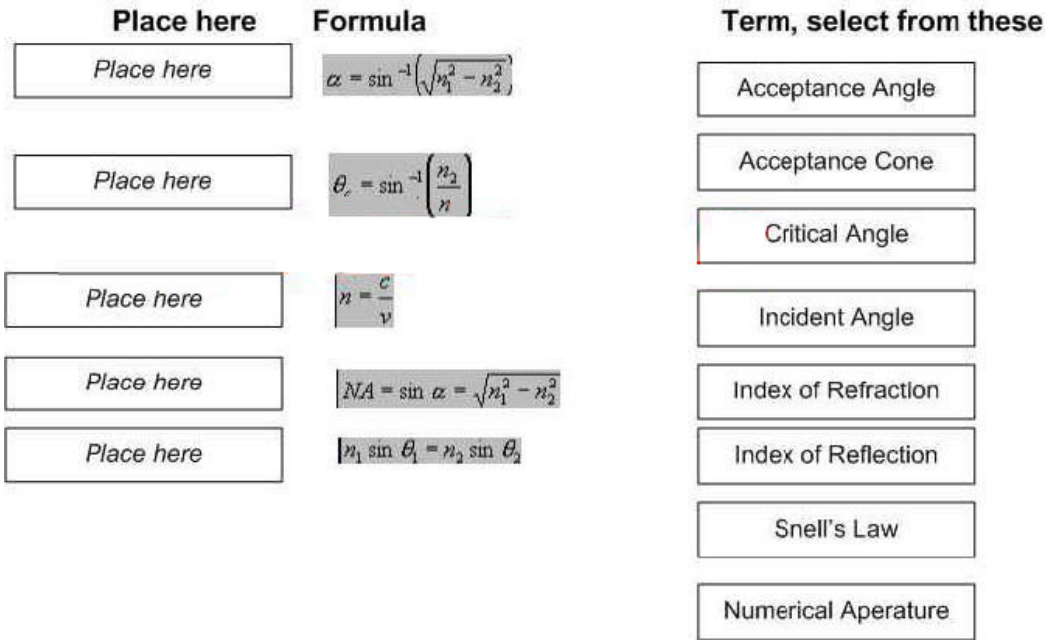
Answer: B

QUESTION 49
Which device creates an OEO conversion?

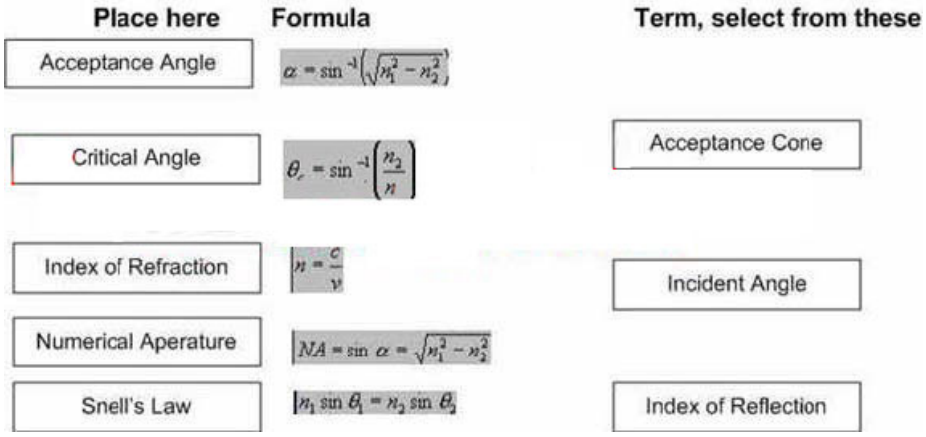
A. Amplifier
B. Attenuator
C. Regenerator
D. Light emitter
E. Optical switch
F. Optical receiver
G. Fiber-optic cable

Answer: C

QUESTION 50
DRAG DROP
Match the appropriate term to each formula.



Answer:



QUESTION 51
What is the phenomenon called where different wavelengths of light travel at different speeds?

A. OSNR
B. Dispersion
C. Light skew
D. attenuation

Answer: B

QUESTION 52
What is the difference between the transmitted power and the sensitivity of the receiver?

A. OSNR
B. Dispersion
C. Attenuation
D. Power budge
E. Ampliefier spacing
F. Four wave mixing

Answer: D

QUESTION 53
Which three technologies are used to reduce chromatic dispersion accumulation in fiber optic transmission systems? Choose three

A. PIN photodiodes
B. Zero-chirped lasers
C. Erbium-doped fiber amplifiers
D. Dispersion compensating fiber
E. Dispersion compensating Bragg grating

Answer: B, D, E

QUESTION 54
What three in combination are factors that can cause four-wave mixing in the fiber-optic cables? Choose three

A. Low optical power
B. High optical power
C. Few optical channels
D. Many optical channels
E. Low chromatic dispersion
F. High chromatic dispersion
G. Too much power differential in the optical channels

Answer: B, D, F
Ref. CiscoPress "Optical Network Design and Implementation" pp. 69-70, CiscoPress "DWDM Network Design and Engineering Solutions" p. 2

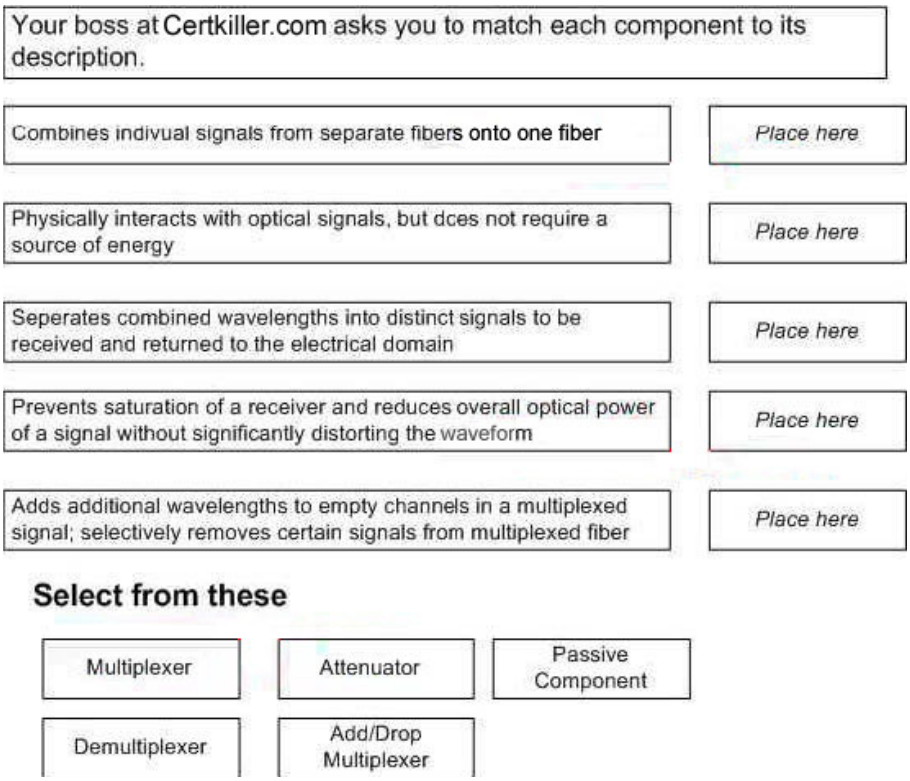
QUESTION 55
Why are the 1300 nm and 1550 nm regions of the fiber spectrum primarily used for optical communications?

A. They are both regions of lowest loss.
B. They are both regions of low reflections
C. They are both regions of low index of refraction.
D. They are both regions of low chromatic dispersion.

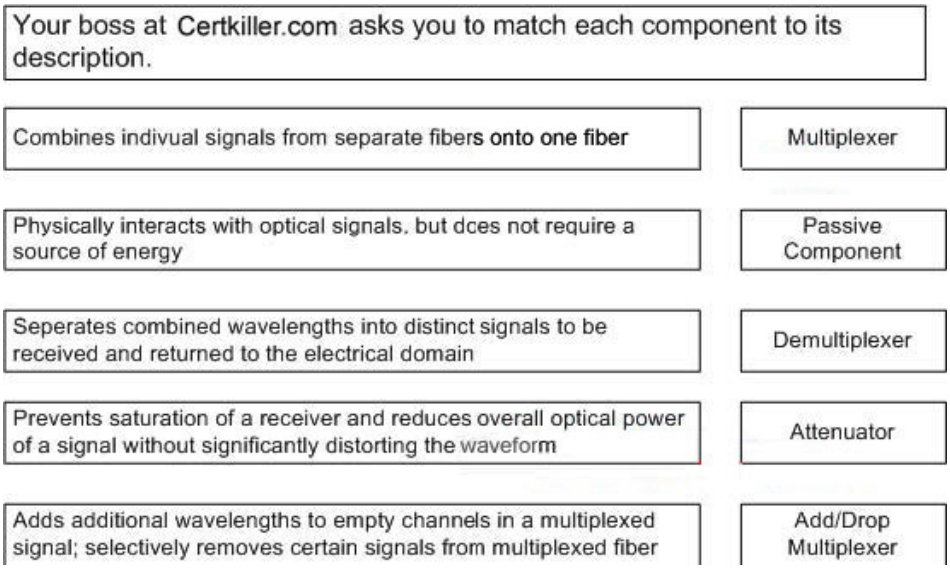
E. They are both regions of low Polarization Mode Dispersion (PMD).

Answer: A

QUESTION 56
DRAG DROP



Answer:



QUESTION 57
Formula exhibit:

(Fiber Attenuation * Km) + (Splice Attenuation * // os Splices) +(Connector Attenuation * # of Connectors) + (Optical Fiber or OADM) + Buffer(Fiber aging)

With regard to SONET/SDH optical calculations, what will the given formula provide?

A. Fiber loss
B. OSNR level
C. Post amplification
D. Index of reflection
E. Index of refraction
F. Power post amplification budget

Answer: A

QUESTION 58
If the power is 0 dBm, what is the power in mW?

A. 0 mW
B. 1 mW
C. 10 mW
D. 1.5 mW

Answer: B

QUESTION 59
What is an advantage of an externally modulated laser over a directly modulated laswer?

A. Lower cost
B. Higher chirp
C. Easier to manufacture
D. Higher dispersion tolerance
E. Higher optical signal-to-noise ratio

Answer: D