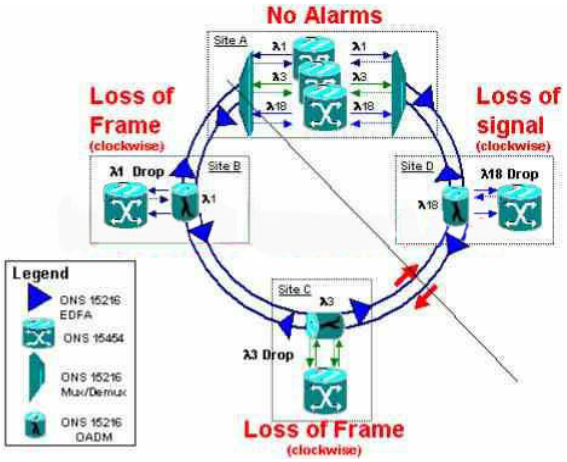
Exam : 642-311

Title : Cisco Optical SONET Exam

Ver : 10.05.07

QUESTION 1:

The exhibit shows a 15454/15216 DWDM system and alarm indications.



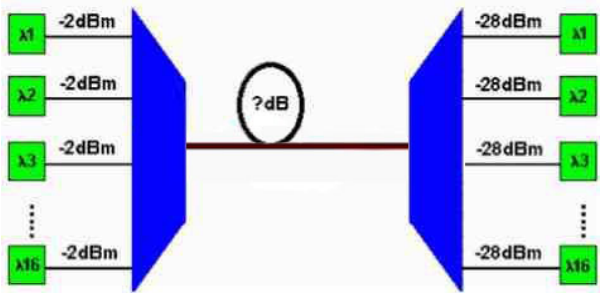
What are two possible sources of trouble shown in the system? (Choose two.)

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. 15216 multiplexer at Site A (counter-clockwise direction)
E. OADM pass-through (West "OUT") failure at site D (clockwise)
F. wavelengths 1 and 3 transmitter failures at site A (clockwise direction)

Answer: A, B

QUESTION 2:

What is the maximum allowable loss budget between the ONS 15216 Mux (left side) composite output and the ONS 15216 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 3:

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 a lower pass-through loss using multi-channels OADMs.
E. You can extract a single channel without dropping other channels.

Answer: A, E

QUESTION 4:

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 5:

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 of only a single-channel module. 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 6:

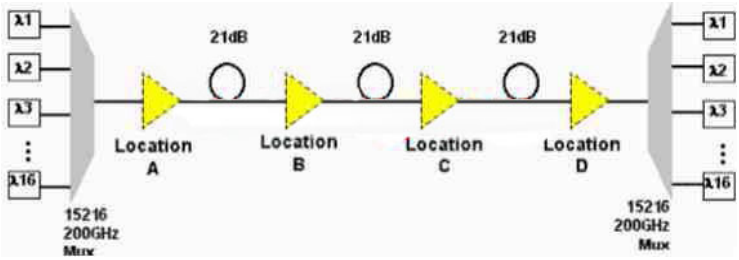
A 2.5 Gb/s (OC-48 or STM-16) optical signal with a dispersion tolerance of 1200 ps/nm goes through fiber with 18 ps/nm*km of dispersion.
How many 15216-DCU-350 equivalents are needed for enough compensation after traveling 100 km?

A. none
B. one
C. two
D. three
E. four

Answer: C

QUESTION 7:

Given the following parameters:
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 B, C only
B. Locations A, B, C only
C. Locations A, B D only
D. Locations B, C, D only
E. Locations A, B, C D

Answer: A

QUESTION 8:

A Channel ID mismatch occurs when _____.

A. fibers are terminated incorrectly in a mode
B. the channel number in the received K1 byte is not identical to the channel number transmitted in the K2 byte
C. the channel number in the received C1 byte is not identical to the channel number transmitted in the C2 byte
D. the channel number in the received C2 byte is not identical to the channel number transmitted in the C1 byte
E. the channel number in the received K2 byte is not identical to the channel number transmitted in the K1 byte

Answer: E

QUESTION 9:

Which timing mode is appropriate for a SONET NE that is adjacent to a SONET NE using BITS-1 timing source?

A. DUS
B. line timing
C. loop timing
D. internal timing
E. through timing

Answer: B

QUESTION 10:

In order to avoid misconnections due to a failed node in a Bidirectional Line Switched Ring (BLSR), Alarm Indication Signals (AISs) are sent on every channel normally terminating in that node.
What is the name of this process?

A. trunking
B. squelching
C. nodal bypass
D. bridge and roll
E. node failure insertion

Answer: B

QUESTION 11:

What protection method is used in 4F BLSR networks?

A. Each fiber has half of its SONET capacity reserved for protection.

B. Two fibers in the span carry working traffic, while the other two fibers in the span 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 determined which fiber has the working bit set for the receiver to acknowledge.

Answer: B

QUESTION 12:

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

Answer: A

QUESTION 13:

Scrambling of SONET signals is done to _____.

A. prevent the leakage of external fiber emissions
B. provide the optical network with the highest level of security possible
C. assure an even distribution of 1's and 0's for extended transmitter life
D. assure an adequate number of transitions for clock recovery at the receiver
E. prevent the receiver from assuming AIS inadvertently when all 0's are received

Answer: D

QUESTION 14:

SONET Code Violations (CV's) totals in the PM tables are actually an accumulation of the number of _____.

A. JO errors detected in a specified interval
B. error detected in a given Errored Second (ES)
C. errors detected in a given Severely Errored second (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 15:

SONET Path Terminating Equipment (PTE) requires which three line codes to be supported for DS1 and DS3 circuits? (Choose three.)

A. AMI
B. ESF
C. DUS
D. SSM
E. B3ZS
F. B8ZS

Answer: A, E, F

QUESTION 16:

How is UPSR and BLSR traffic rerouted during a protection switch when a complete fiber cable cut occurs?

A. Traffic is switched from the first node receiving the AIS indication.
B. Traffic is switched from the far side of the failure, allowing handshake to occur.
C. UPSR traffic is switched from the terminating node, BLSR traffic is rerouted from the originating node in the ring.
D. UPSR traffic is switched from the terminating node, circuit by circuit. BLSR traffic is rerouted from the last reachable node in the ring.

Answer: D

QUESTION 17:

Which 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 18:

UPSR protection is initiated by _____, while BLSR is initiated by _____.

A. the K1 SONET byte;the K2 SONET byte
B. K2 SONET byte ;the K1 SONET byte

C.transmitter awitch;reciver detection
D. line overhesd bytes;path overhesd bytes
E. path overhesd bytes;line overhesd bytes

Answer: C, A
UPSR is C. transmitter switching receiver detection
BLSR is A. the K1 and K2 SONET byte

QUESTION 19:

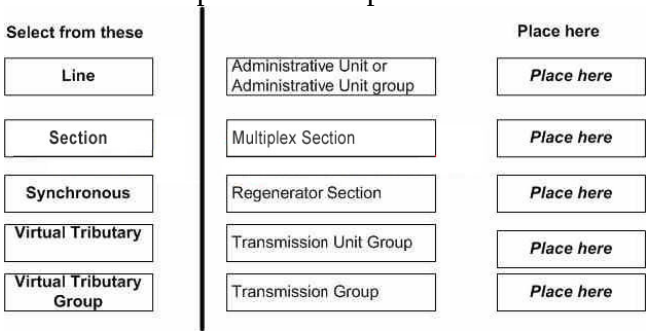
If node 2 is accepting line timing from node 1, node 2 will send _____ to node 1 as its SSM message.

A. ESF
B. PRS
C. DUS
D. SMC
E. B8ZS

Answer: C

QUESTION 20:

DRAG DROP
Match the compatible concepts in SONET and SDH terminology.



Answer:

QUESTION 21:

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 22:

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 23:

What three in combination are factors that can cause four-wave mixing in 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, C, E

QUESTION 24:

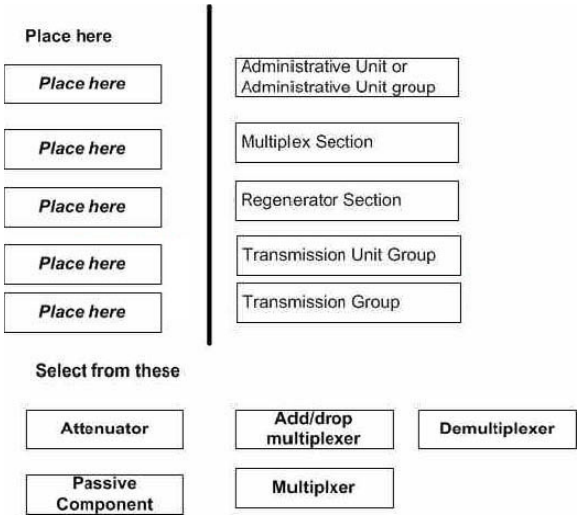
Given the formula:
(Fiber Attenuation * Km) + (Splice Attenuation* # of Splices) + (Connector Attenuation * # of Connectors) + (Optical Fiber of OADM) + (Buffer (Fiber aging))

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 25:

DRAG DROP
Match the component to its description.



Answer:

QUESTION 26:

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

A. OSNR
B. dispersion
C. attenuation
D. power budget
E. amplifier spacing
F. four wave mixing

Answer: D

QUESTION 27:

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 28:

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 29:

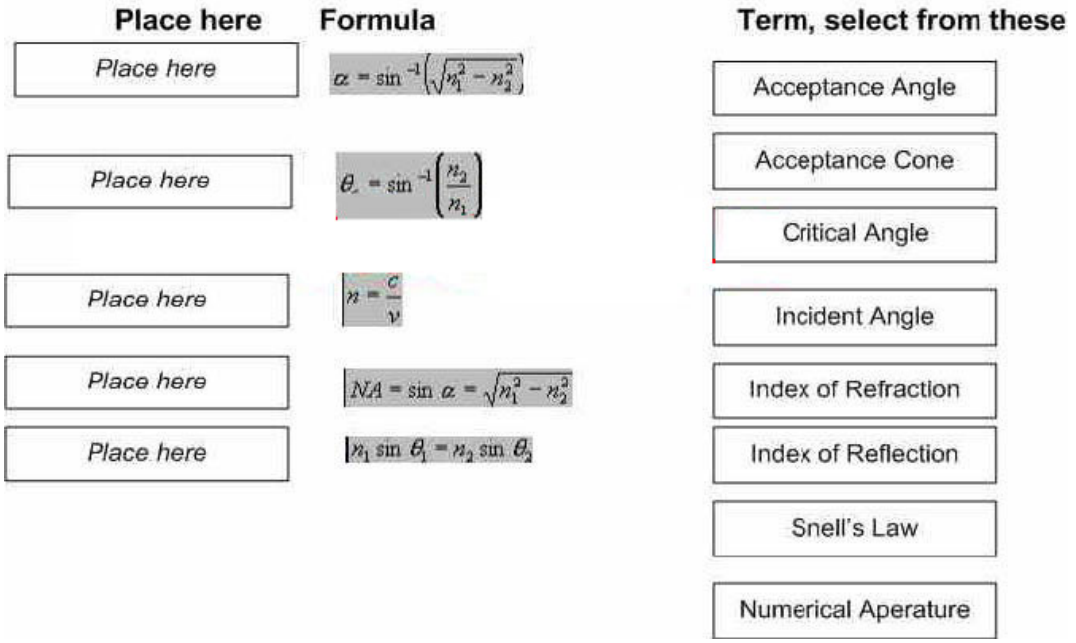
Which three technologies are used to reduce chromatic dispersion accumulation in fiber-optic transmission systems? (Choose three.)

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

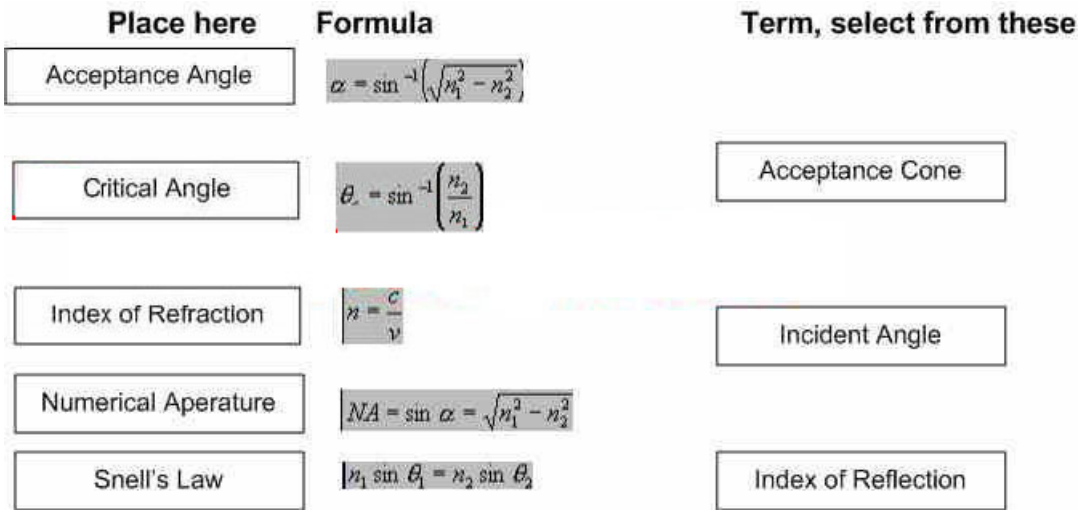
Answer: B, D, E

QUESTION 30:

DRAG DROP
Match the appropriate term to each formula.



Answer:



QUESTION 31:

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 32:

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 33:

How is a Thin Film filter fabricated?

A. The glass core is doped with an Erbium in periodic segments of the fiber.
B. Layers of high index "H" and low level "L" material are deposited on a glass substrate.
C. Thin layers of silica glass are placed 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: C

QUESTION 34:

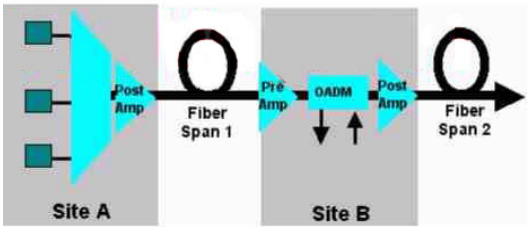
The dispersion of a non-zero dispersion shifted fiber is 6 ps/nm*km at 1550 nm and 10 ps/nm* km at 1610 nm.
What is the minimum dispersion compensation required if an L-Band DWDM signal travels through 200 km of fiber and has a dispersion tolerance of 1800 ps/nm?

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

Answer: C

QUESTION 35:

Exhibit:



When designing a DWDM system with multiple amplified spans, a pre-amp is needed at 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, C, E

QUESTION 36:

If the dispersion of a given fiber is 17 ps/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. 340 ps/nm
C. 200 ps/nm
D. 3400 ps/nm
E. More information is needed.

Answer: D

QUESTION 37:

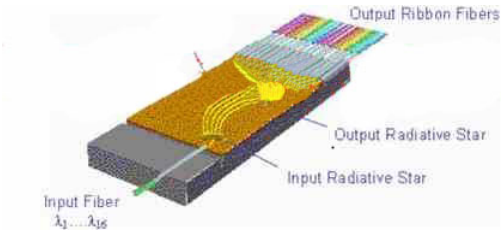
What are three factors that limit the maximum distance of an amplified optical signal without regeneration?

A. fiber dispersion
B. signal attenuation
C. transmitter power
D. amplifier bandwidth
E. receiver dispersion tolerance

Answer: A, B, D

QUESTION 38:

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 39:

In the OSNR model for EDFA amplifiers, SNROUT = 1/(1SNRIN + FhvB/PIN), what does SNRIN represent?

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

Answer: B

QUESTION 40:

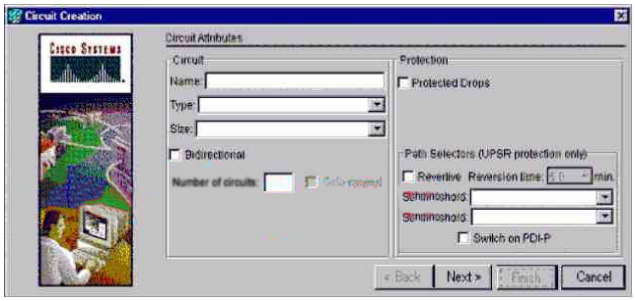
A customer wants to create a 1:1 protection group with a DS3N-12 card.
Which card slots would allow for a 1:1 protection?

A. Slot 2 and Slot 4
B. Slot 4 and Slot 6
C. Slot 5 or Slot 13 only
D. Slot 16 and Slot 17

Answer: D

QUESTION 41:

Exhbit:



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

A. revertive
B. circuit type
C. circuit size
D. bidirectional
E. protected drops
F. switch on PDI-P

Answer: B, C

QUESTION 42:

You are provisioning a DS-1 circuit on an ONS 15454 UPSR configuration and XC-10G card.
How many total VT ports are used within the VT matrix at the source node?

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

Answer: D

QUESTION 43:

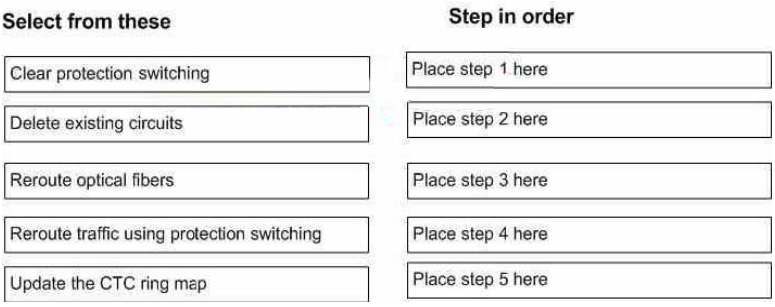
You are provisioning a DS-1 circuit on an ONS 15454 2F-BLSR with a XC-10G card. Each VT 1.5 connection must also terminate via the STS matrix. On the originating circuit node, how many STS ports are now available for VT 1.5 circuits?

A. 2
B. 3
C. 4
D. 20
E. 22
F. 24

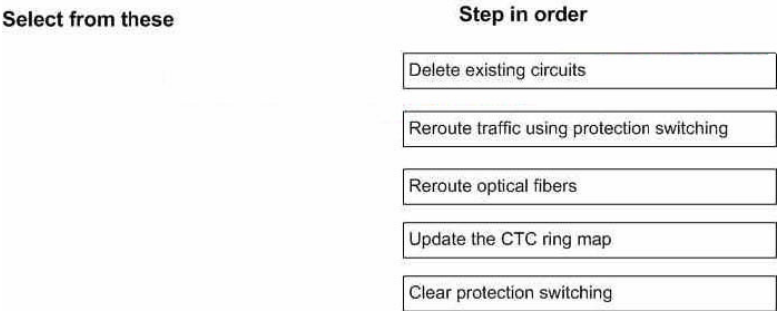
Answer: E

QUESTION 44:

DRAG DROP
Place the steps for removing a node from an existing BLSR ring in the proper order.



Answer:



QUESTION 45:

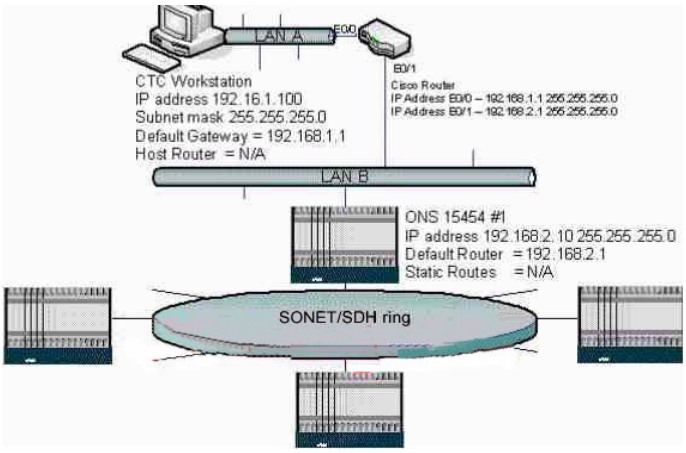
Which three timing modes are supported on the ONS 15454 shelf? (Choose three.)

A. line timing
B. loop timing
C. internal timing
D. through timing
E. external timing

Answer: A, C, E

QUESTION 46:

Network topology exhibit:



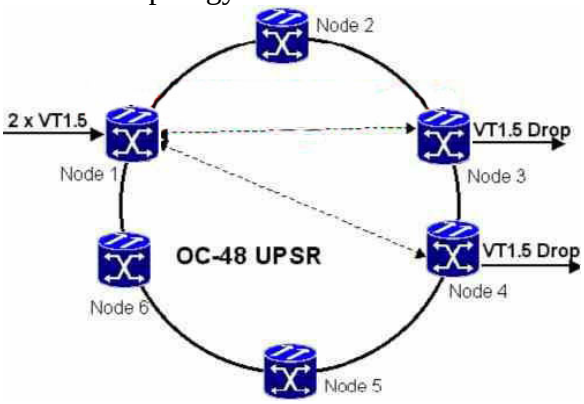
In the DCN connection shown in the exhibit, all non-GNE nodes are located on different subnets from the GNE. There are no static routes or external OSPF on any elements. CTC Workstation and GNE have Cisco Router as their default gateway.
Can the CTC workstation see the entire SONET network?

A. Yes, but only if OSPF is enabled around the ring.
B. Yes, because the GNE will only serve as a proxy-ARP for elements on the same subnet.
C. Yes, but only if the router's address is entered as a static route in the non-GNE elements.
D. Yes, because the GNE will serve as a proxy-ARP for all elements, regardless of their subnets.

Answer: A

QUESTION 47:

Network topology exhibit:



Given the information shown in the exhibit, when creating 2 DS1 circuits, how many STS ports are used on the VT 1.5 matrix at Node 1 as VT circuits and how many are used after using VT tunnels?
A. 2; 0
B. 3; 0
C. 3; 5
D. 4; 0
E. 6; 0
F. 6; 2

Answer: C

QUESTION 48:

You are installing a Cisco ONS 15454 in a service provider site. A DS3 cable is to be 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:

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 50:

Why is an OC-3 2F-BLSR not feasible?

A. Switch times would exceed 50 ms for an OC-3 BLSR ring.
B. An equal amount of working and protect bandwidth is required.
C. DCC bandwidth is not large enough to handle K1/K2 processing.
D. There is not enough bandwidth in an OC-3 ring to justify BLSR protection.

Answer: B

QUESTION 51:

What type of protection is shown in the exhibit?

A. 1 + 0
B. 1 + 1
C. 1:1
D. 1:N

Answer: B

QUESTION 52:

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

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

Answer: B

QUESTION 53:

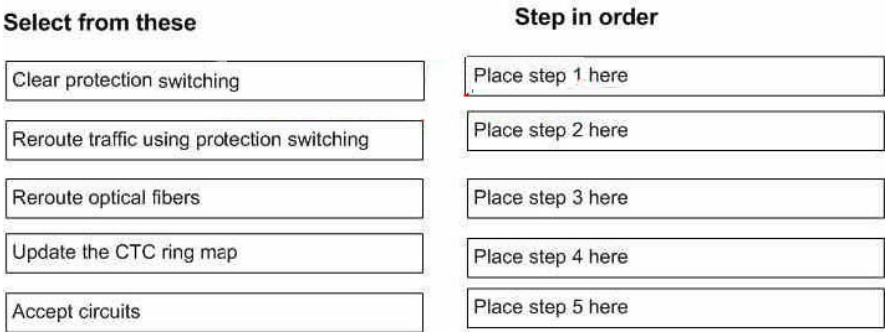
What are two characteristics of dual-ring interconnect in SONET networks? (Choose two.)

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.

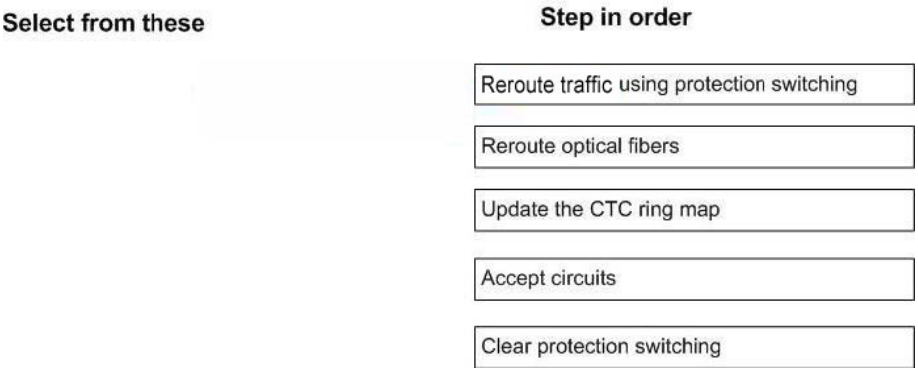
Answer: A, D

QUESTION 54:

DRAG DROP
Place the steps for adding a new node to an existing BLSR ring in the proper order.



Answer:



QUESTION 55:

A customer has 2 DS1's to add between adjacent nodes in a UPSR ring.
What type of circuit should you recommend?

A. VT circuits
B. Sts circuits
C. VT tunnel circuits
D. 1:1 protection circuits
E. 1:N protection circuits

Answer: A

QUESTION 56:

The ML-series Ethernet card on the ONS 15454 provides up to _____ active Q-in-Q instances per card.

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

Answer: A

QUESTION 57:

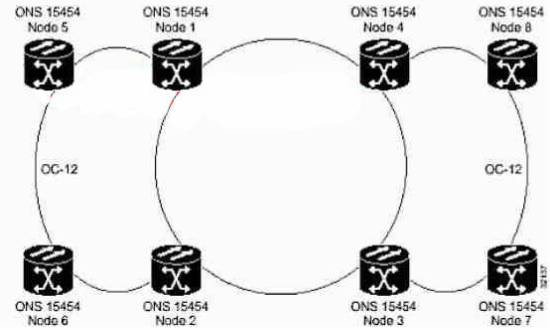
What is the correct relative switching priority in a BLSR ring (higher to lower)?

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 58:

Network topology exhibit:



A customer has several interconnected core rings (see exhibit). They want to create several "virtual rings" utilizing their OC-192 backbone (nodes 1,2,3,4).
What should you recommend?

A. PPMN with BLSR rings
B. PPMN with UPSR rings
C. 1:N protection with all core circuits
D. multi-ring interconnect with BLSR rings

Answer: B

QUESTION 59:

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

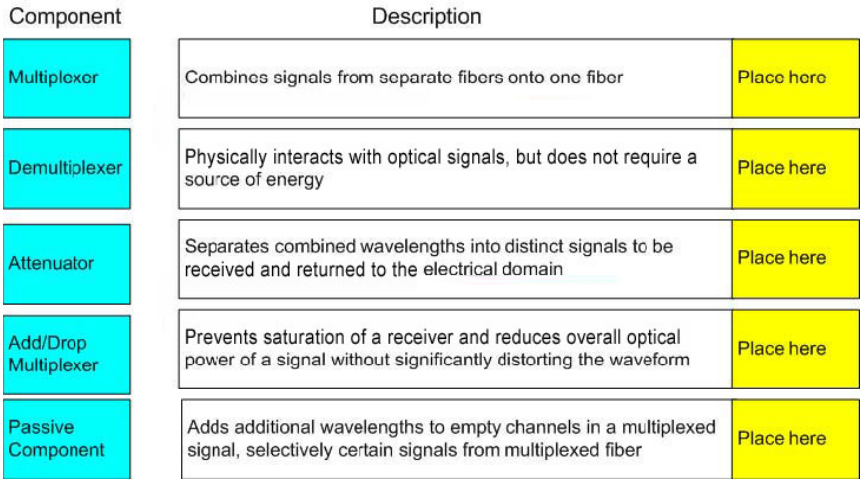
A. line timing
B. loop timing
C. internal timing

D. through timing
E. external timing

Answer: C

QUESTION 60:

DRAG DROP



Answer: