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642-887

Implementing Cisco Service Provider Next-Generation Core Network Services (SPCORE)

Version 1.0



## Exam A

### QUESTION 1

Which three conditions can occur when metering traffic using a dual token bucket traffic policing QoS mechanism on Cisco routers? (Choose three.)

- A. conform
- B. pass
- C. violate
- D. exceed
- E. burst
- F. matched

**Correct Answer:** ACD

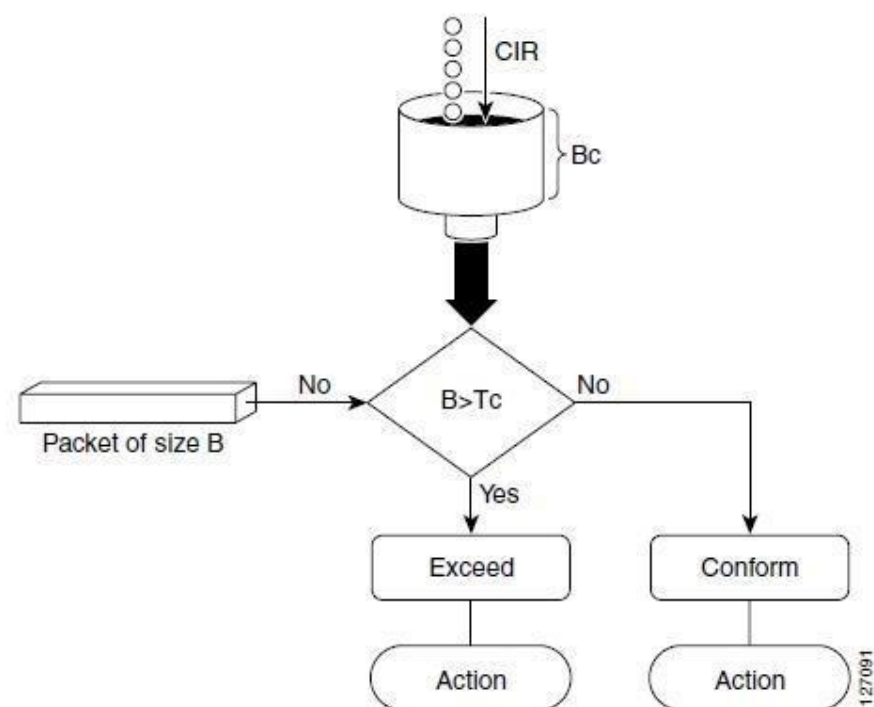
**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

**Figure 2** How a Traffic Policing Mechanism Regulates Traffic



The time interval between token updates ( $T_c$ ) to the token bucket is updated at the CIR value each time a packet arrives at the traffic policer. The  $T_c$  token bucket can contain up to the  $B_c$  value. If a packet of size  $B$  is greater than the  $T_c$  token bucket, then the packet exceeds the CIR value and a configured action is performed. If a packet of size  $B$  is less than the  $T_c$  token bucket, then the packet conforms and a different configured action is performed.

**QUESTION 2** What is the correct formula for determining the CIR?

- A.  $CIR = B_c / T_c$
  - B.  $CIR = B_c \times T_c$
  - C.  $CIR = T_c / B_c$
  - D.  $CIR = B_c + B_e$
  - E.  $CIR = T_c / (B_c + B_e)$
  - F.  $CIR = (B_c + B_e) / T_c$
- Correct Answer:** A

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

Committed Information Rate (CIR) – the rate the device will send at (on average) over a one second period.

The default CIR when traffic-shaping is enabled on the interface is 56K. CIR is also referred to as the “target rate”. Since the device is forced to send at the AR, it does not send all of the time (within one second) in order to send an average amount of data that equals the CIR.

Minimum CIR (mincir) – the rate the service provider guarantees to accept. Theoretically, the provider will set the DE bit for all traffic above this rate. Mincir is designed to be used in conjunction with adaptive shaping. With adaptive shaping, the router will throttle down in the event of congestion. The router will not throttle down below this value.

Committed Burst (Bc) – the number of committed bits allows to be sent during a given interval. The device sends an average amount of traffic to achieve the CIR. The Bc value defaults to 1/8 of the configured CIR for speeds below 650K. For speeds above that, it is roughly 1/16 of CIR.

Excess Burst (Be) – the number of non-committed bits the router is allowed to send above Bc during the first interval (Tc). The amount of Be “credits” is derived from unused Bc credits in previous intervals. There is no limit to how long Be can “store” unused Bc credits. It is a common misconception that Be can only store credits from the previous interval or the previous second. There is no default Be value. Committed Rate Measurement Interval (Tc) – the time interval over which Bc or Bc+Be can be transmitted. The max value is 125 ms and the minimum value is 10 ms. **The Formula**

CIR, Tc, and Bc are related mathematically by the following formula:

$CIR = Bc / (Tc / 1000)$  Notice the division of Tc by 1000 is used to convert milliseconds into seconds – the common measurement of CIR and Bc.

### QUESTION 3

DS-TE implementations on Cisco routers support which bandwidth pool(s) and class type(s)? (Choose two.)

- A. global pool only
- B. subpool only
- C. global pool and subpool
- D. class-type 0 only
- E. class-type 1 only
- F. class-type 0 and class-type 1

**Correct Answer:** CF

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

Differential Service Tunnels

Differential Service Traffic Engineering (TE) is an extension of the regular MPLS Traffic Engineering (MPLSTE) feature. Regular TE does not provide bandwidth guarantees to different traffic classes. A single bandwidth pool (global pool) is used in regular TE that is shared by all traffic. In order to support various class of service (CoS), the ability to provide multiple bandwidth pools is required. These bandwidth pools then can be treated differently based on the requirement for the traffic class using that pool.

In RSVP global and subpools reservable bandwidths are configured on a per interface basis to accommodate TE tunnels on the node. Available bandwidth from all configured bandwidth pools is advertised using Interior Gateway Protocol (IGP). RSVP is used to signal the TE tunnel with appropriate bandwidth pool requirements.

**QUESTION 4** Which field in the MPLS shim header is used to support different QoS markings?

- A. IP precedence
- B. DSCP
- C. EXP
- D. ToS
- E. S
- F. Label

**Correct Answer:** C

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

MPLS EXP Marking



The three MPLS EXP (experimental) bits in the shim header of an input or output MPLS packet header may be set or changed by a user configured value

**QUESTION 5** On a Cisco IOS XR router, which mechanism protects the router resources by filtering and policing the packets flows that are destined to the router that is based on defined flow-type rates?

- A. LLQ
- B. LPTS
- C. Committed Access Rate
- D. Control Plane Policing
- E. Management Plane Protection
- F. NetFlow
- G. ACL

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Local Packet Transport Services (LPTS) maintains tables describing all packet flows destined for the secure domain router (SDR), making sure that packets are delivered to their intended destinations. The Low Latency Queueing feature brings strict priority queueing to Class-Based Weighted Fair Queueing (CBWFQ).

**QUESTION 6** When configuring LLQ (strict priority queue) on a traffic class using the Cisco IOS XR priority command on a Cisco ASR9K router, which additional QoS command is required for this traffic class?

- A. shape
- B. police
- C. random-detect
- D. bandwidth



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The Low Latency Queueing feature brings strict priority queueing to Class-Based Weighted Fair Queueing (CBWFQ).

**QUESTION 7** On the Cisco ASR9K router, when using the bandwidth command to specify the minimum guaranteed bandwidth to be allocated for a specific class of traffic, what will be used as the queuing algorithm?

- A. custom queuing
- B. CBWFQ
- C. WFQ
- D. FIFO
- E. priority queuing

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Class based weighted fair queuing (CB-WFQ) was initially released without the support of a priority queuing system, thus it could not guarantee the delay and jitter (delay variation) requirements of real-time, interactive voice and video conversations. Since for CBWFQ, the weight for a packet belonging to a specific class is derived from the bandwidth assigned to the class, which in turn determines the order in which packets are sent. All packets are serviced fairly based on weight and no class of packets may be granted strict priority. This scheme poses problems for voice traffic that is largely intolerant of delay, especially variation in delay

**QUESTION 8**

When implementing MPLS DS-TE on Cisco IOS XR routers, all aggregate Cisco MPLS TE traffic is mapped to which class type by default?

- A. class-type 0 (bandwidth global pool)
- B. class-type 1 (bandwidth subpool)
- C. class-type 2 (bandwidth priority)
- D. class type class-default (bandwidth best-effort)

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Differentiated Services Traffic Engineering

MPLS Differentiated Services (Diff-Serv) Aware Traffic Engineering (DS-TE) is an extension of the regular MPLS-TE feature. Regular traffic engineering does not provide bandwidth guarantees to different traffic classes. A single bandwidth constraint is used in regular TE that is shared by all traffic. To support various classes of service (CoS), users can configure multiple bandwidth constraints. These bandwidth constraints can be treated differently based on the requirement for the traffic class using that constraint.

MPLS diff-serv traffic engineering provides the ability to configure multiple bandwidth constraints on an MPLS-enabled interface. Available bandwidths from all configured bandwidth constraints are advertised using IGP.

TE tunnel is configured with bandwidth value and class-type requirements. Path calculation and admission control take the bandwidth and class-type into consideration. RSVP is used to signal the TE tunnel with bandwidth and class-type requirements.

Diff-Serv TE can be deployed with either Russian Doll Model (RDM) or Maximum Allocation Model (MAM) for bandwidth calculations.

#### TE Class Mapping

Each of the eight available bandwidth values advertised in the IGP corresponds to a TE Class. Because the IGP advertises only eight bandwidth values, there can be a maximum of only eight TE classes supported in an IETF DS-TE network. TE class mapping must be exactly the same on all routers in a DS-TE domain. It is the responsibility of the operator to configure these settings properly as there is no way to automatically check or enforce consistency.

The operator must configure TE tunnel class types and priority levels to form a valid TE class. When the TE class map configuration is changed, tunnels already up are brought down. Tunnels in the down state, can be set up if a valid TE class map is found.

**Table 4 TE Classes and Priority**

TE Class	Class Type	Priority
0	0	7
1	1	7
2	Unused	
3	Unused	
4	0	0
5	1	0
6	Unused	
7	Unused	



The default mapping includes four classes types.

**QUESTION 9** On the Cisco IOS XR, which MQC configuration is different than on the Cisco IOS and IOS XE?

- A. On the Cisco IOS XR, WRED can only be applied in the output direction.
- B. On the Cisco IOS XR, marking can only be applied in the input direction.
- C. On the Cisco IOS XR, LLQ can be applied in the input or output direction.
- D. On the Cisco IOS XR, LLQ can use up to four priority queues: level 1, level 2, level 3, and level 4.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 10** On Cisco routers, how is hierarchical QoS implemented?

- A. Within the parent policy, reference another child policy using the policy-map command.
- B. Within the child policy, reference another parent policy using the policy-map command.
- C. Use the policy-map command within a service-policy to implement nested policy-maps.
- D. Within the parent policy-map, reference another child policy-map using the service-policy command.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 11

Refer to the Cisco IOS XR policy-map configuration exhibit.

```
policy-map test
!
class one
priority level 1
!
class two
priority level 2
!
class three
bandwidth percent 60
!
interface GigabitEthernet0/0/0/2
service-policy output test
!
!
```

What is wrong with the policy-map configuration?

- A. missing the priority percent command under class one and class two
- B. missing the police command under class one and class two
- C. missing the police command under class three
- D. missing the priority bandwidth command under class one and class two
- E. missing the bandwidth command under class one and class two

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Hierarchical policing is also supported. In such a configuration, both parent and child policies have class-maps containing policing statements, as in the following example:

```
!
policy-map child
class gold
police rate percent 50 conform-action set precedence immediate exceed-action drop
!
!
policy-map parent
class match_all
police rate 10000
kbps burst 15000
exceed-action
```

drop service-  
policy child

#### QUESTION 12

When configuring class-based WRED on Cisco routers, which WRED parameter is not user configurable on a Cisco IOS XR but is user configurable on a Cisco IOS and IOS XE?

- A. the ingress or egress direction where the class-based WRED policy will be applied
- B. the maximum threshold
- C. the minimum threshold
- D. the mark probability denominator

**Correct Answer:** D

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

Comparison of Cisco IOS QoS and Cisco IOS-XR QoS

The Cisco IOS-XR software implementation of QoS is basically the same as the QoS implementation on Cisco IOS software, with the following exceptions:

- On Cisco IOS-XR software, the bandwidth command can be configured only in egress policies.
- The following changes have been made to the class-map command on Cisco IOS-XR software:

–Supports 4K per logical router.

–Maximum number of match criteria configurable in one class map is eight.

•When a class is marked as high priority using the priority command on Cisco IOS-XR software, we recommend that you configure a policer to limit the priority traffic. Limiting the priority traffic will ensure that the priority traffic does not starve all of the other traffic on the line card. Use the police command to explicitly configure the policer.

•On Cisco IO-XR software, only one conform-action, exceed-action, or violate-action command can be configured at a time. To configure traffic policing, use the police command.

•On Cisco IOS-XR software, policy modifications cannot be made on existing policies. Use the policy-map command to remove the policy from all attached interfaces, delete the policy map, and redefine a new policy.

•When configuring a policy map on Cisco IOS-XR software, the maximum number of classes configurable in one policy map is 16, which includes both Level 1 and Level 2 classes. To configure a policy map, use the policy-map command.

•When WRED is configured on Cisco IOS-XR software, the mark probability in the random-detect command is not configurable—it is always set to 1.

•When the random-detect exp command is used on Cisco IOS-XR software, the exponential weighting constant is not configurable and will be programmed automatically by Cisco IOS-XR software.

•When access control lists (ACLs) are used in QoS class maps, the underlying deny or permit actions associated with access control entries (ACEs) are ignored. ACEs are used as a classification mechanism in order to provide appropriate QoS behavior as specified in class maps. Use ACLs that include ACEs with permit actions only.

#### QUESTION 13 Which of the following three statements are correct regarding IPv6 QoS?

(Choose three.)

- A. The traffic class field in the IPv6 header can be used to set specific precedence or DSCP values.
- B. A 20-bit flow label field enables per-flow processing.
- C. DS-TE is not supported by IPv6.
- D. Per-hop behavior in IPv6 networks is based on EXP bits.
- E. IPv6 QoS features are configured using the modular QoS CLI on Cisco routers.

**Correct Answer:** ABE

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

[http://www.cisco.com/en/US/technologies/tk648/tk872/technologies\\_white\\_paper0900aecd8026004d.pdf](http://www.cisco.com/en/US/technologies/tk648/tk872/technologies_white_paper0900aecd8026004d.pdf)

Cisco Systems. IPv6 QoS  
AT-A-GLANCE

RFC 2460/3697

Currently IPv6 provides support for QoS marking via a field in the IPv6 header.

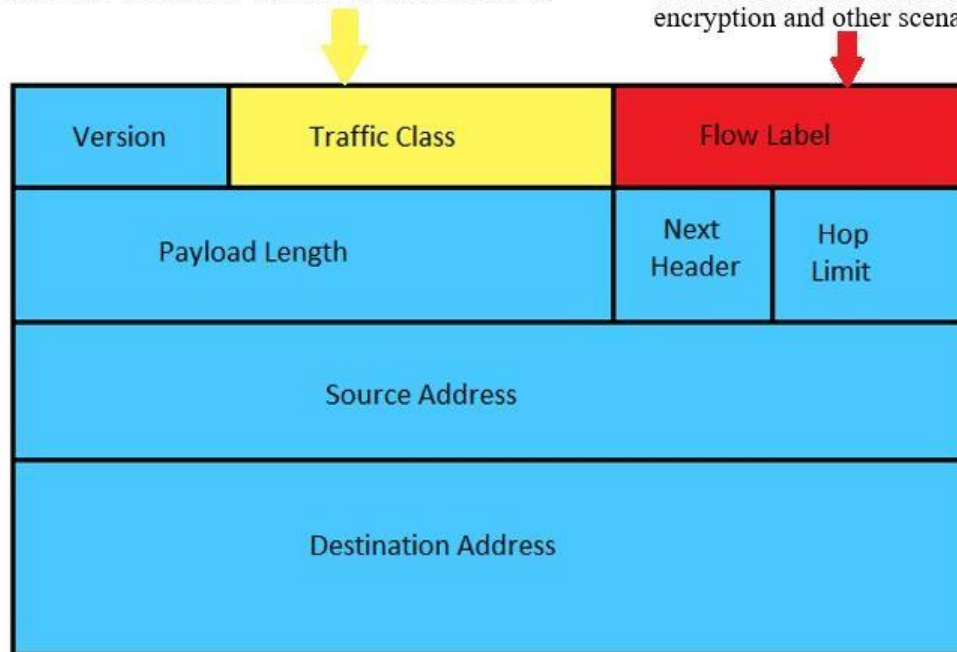
Similar to the type of service (ToS) field in the IPv4 header, the traffic class field (8 bits) is available for use by originating nodes and for forwarding routers to identify and distinguish between different classes or priorities of IPv6 packets.



Figure 1

The traffic class field may be used to set specific precedence or differentiated services code point (DSCP) values. These values are used in the exact same way as in IPv4

The key advantages with the flow label is that the transit routers do not have to open the inner packet to identify the flow, which aids with identification of the flow when using encryption and other scenarios.



Current Cisco IOS Software support for IPv6 QoS includes:

- Packet classification
- Queuing (includes LLQ; excludes legacy PQ/CQ)
- Traffic shaping
- WRED

IPv6 also has a 20-bit field known as the flow label field (RFC 3697). The flow label enables per flow processing for differentiation at the IP layer. It can be used for special sender requests and is set by the source node.

The flow label must be modified by an intermediate mode.

Planned Cisco IOS Software support for IPv6 QoS includes:

- Compressed Real-Time Protocol (cRTP)
- Network-based application recognition (NBAR)
- Committed access rate (CAR)

#### QUESTION 14

With unmanaged CE routers, at which point in the service provider network is the QoS trust boundary, and what is required at the trust boundary?

- A. between the CE and PE router and mapping of the customer traffic classes into the service provider traffic classes at the PE router ingress
- B. between the CE and PE router and trusting the QoS markings from the CE router and applying the required QoS mechanisms based on the customer QoS markings
- C. between the PE and the P router and mapping of the customer traffic classes into the service provider traffic classes at the P router ingress
- D. between the PE and P router and trusting the QoS markings from the CE router and applying the required QoS mechanisms based on the customer QoS markings
- E. between the customer network and the CE router ingress and applying the required egress QoS policy on the CE router

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 15

On the Cisco IOS XR, when using the match protocol command within a class-map to classify traffic, you noticed that the match protocol option on the Cisco IOS XR shows much fewer protocol options than on the Cisco IOS or IOS XE, like there is no option such as the match protocol yahoo-messenger command on the Cisco IOS XR. Why is this?



- A. because the Cisco IOS XR router does not have the correct software packages installed
- B. because when defining the class-map, the class-map type should be set to type inspect: class-map type inspect class-map-name command
- C. because NBAR is not supported on the Cisco IOS XR
- D. because flexible packet matching has not been enabled on the Cisco IOS XR router

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

#### QUESTION 16

Within the service provider core network, which two QoS mechanisms are typically deployed on the P routers? (Choose two.)

- A. LLQ
- B. traffic policing and remarking
- C. WRED
- D. traffic shaping
- E. traffic classification and markings
- F. link fragmentation and interleaving

**Correct Answer: AC**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 17** Which three steps are required to configure QPPB on Cisco IOS XR routers? (Choose three.)



- A. Apply a QPPB route policy to the BGP process using the table-policy command
- B. Apply a QPPB route policy to the BGP neighbor using the route-policy command
- C. Define a QPPB route policy to match the customer routes, then set the IP precedence or qos-group
- D. Define a QPPB route policy to match the customer IP precedence or qos-group markings, then set the BGP community
- E. Enable QPPB on an interface using the ipv4 bgp policy propagation input ip-precedence|qos-group destination|source command
- F. Enable QPPB on an interface using the ipv4 bgp policy propagation output ip-precedence|qos-group destination|source command

**Correct Answer: ACE**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

QoS Policy Propagation via BGP (QPPB), is a mechanism that allows propagation of quality of service (QoS) policy and classification by the sending party based on access lists, community lists and autonomous system paths in the Border Gateway Protocol (BGP), thus helping to classify based on destination instead of source address.

#### QUESTION 18

The Cisco IOS and IOS XE qos pre-classify command allows which kind of packet classification on IP packets that are encapsulated with GRE and IPsec?

- A. allows for packets to be classified based on the ToS byte values before packet encryption
- B. allows for packets to be classified based on the ToS byte values after packet encryption
- C. allows for packets to be classified based on the packet payload before packet encryption
- D. allows for packets to be classified based on the packet payload after packet encryption
- E. allows for packets to be classified based on the packet header parameters other than the ToS byte values after packet encryption

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk543/tk545/technologies\\_tech\\_note09186a008017405e.shtml](http://www.cisco.com/en/US/tech/tk543/tk545/technologies_tech_note09186a008017405e.shtml)

The qos pre-classify command

When packets are encapsulated by tunnel or encryption headers, QoS features are unable to examine the original packet headers and correctly classify the packets. Packets traveling across the same tunnel have the same tunnel headers, so the packets are treated identically if the physical interface is congested. With the introduction of the [Quality of Service for Virtual Private Networks](#) (VPNs) feature, packets can now be classified before tunneling and encryption occur. In this example, tunnel0 is the tunnel name. The qos pre-classify command enables the QoS for VPNs feature on tunnel0: Router(config)# interface tunnel0

Router(config-if)# qos pre-classify

#### QUESTION 19

Which are typical class-based marking policies that are implemented on service provider IP NGN PE routers?

- A. On the PE ingress, classify the customer traffic and then mark with qos-group. On the PE egress, classify based on the qos-group and then mark with mpls exp.
- B. On the PE ingress, classify the customer traffic and then mark with mpls exp. On the PE egress, classify based on the mpls exp and then mark with qos-group.
- C. On the PE ingress, trust the customer QoS markings. On the PE egress, classify based on the customer QoS markings and then mark with qos-group.
- D. On the PE ingress, trust the customer QoS markings. On the PE egress, classify based on the customer QoS markings and then mark with mpls exp.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 20** Which item is not available to be used for QoS classification in

Cisco IOS XR?

- A. MAC SA
- B. protocol
- C. inner EXP
- D. discard-class
- E. QoS-group
- F. VLAN

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 21** Which statement is correct regarding the default MPLS

TTL behavior?

- A. When an ingress edge LSR receives an IP packet, it will decrement the IP TTL field by 1; then it will set the MPLS Label TTL field to 255.
- B. When an ingress edge LSR receives an IP packet, it will decrement the IP TTL field by 1; then it will copy the decremented IP TTL field into the MPLS Label TTL field.
- C. When an ingress edge LSR receives an IP packet, it will just copy the IP TTL field into the MPLS Label TTL field.
- D. When an ingress edge LSR receives an IP packet, it will copy the IP TTL field into the MPLS Label TTL field first; then it will only decrement the MPLS Label TTL field by 1.
- E. When an ingress edge LSR receives an IP packet, it will copy the IP TTL field into the MPLS Label TTL field first; then it will only decrement the IP TTL field by 1.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 22** Which three statements are correct regarding ping mpls command operations?  
(Choose three.)

- A. MPLS OAM has to be enabled on the router using the mpls oam command.
- B. They use a 127/8 address as the destination address in the MPLS echo request packet.
- C. They use ICMP echo request and ICMP echo reply packets.
- D. They are used to test for a broken LSP.
- E. If there is a broken LSP, instead of using label switching, the packet can still be forwarded based on the destination IP address in the mpls ping echo request packet.

**Correct Answer:** ABD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

How MPLS Ping works?

MPLS Ping doesn't rely on ICMP echo messages. Instead it uses UDP protocol with both source and destination port as 3503 and relies on MPLS Echo request and MPLS Echo reply.

When MPLS ping is triggered from any MPLS router, it will generate UDP segment with source/destination port as 3503. The source address will be selected as usual while the destination address will be 127.0.0.1. The IP TTL will be set to 1.

Below is a sample IP format when MPLS Ping is originated from R5 to 150.1.6.6/32,

```

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-----+-----+-----+-----+-----+-----+-----+-----+
|Version|  IHL  |Type of Service|          Total Length          |
+-----+-----+-----+-----+-----+-----+-----+-----+
|          Identification          |Flags|      Fragment Offset      |
+-----+-----+-----+-----+-----+-----+-----+-----+
|  TTL=1  |  Protocol=UDP  |          Header Checksum          |
+-----+-----+-----+-----+-----+-----+-----+-----+
|                                150.1.5.5                        |
+-----+-----+-----+-----+-----+-----+-----+-----+
|                                127.0.0.1                        |
+-----+-----+-----+-----+-----+-----+-----+-----+
|          Options          |          Padding          |
+-----+-----+-----+-----+-----+-----+-----+-----+

```



Now the originating LSR will look into the LFIB and populate the label header with respective labels to reach the FEC, in our case 150.1.6.6/32.

R4 on receiving the MPLS packet will be able to send to the actual destination only if the LSP is end to end. If the LSP is broken between R4 and R6, R4 will look into the destination IP address which will be 127.0.0.1 and won't be able to perform IP forwarding. As per RFC 1812, a router should not forward any packet that has destination address of 127.0.0.0/8

**QUESTION 23** What are the four fields inside the MPLS shim header?  
(Choose four.)

- A. EXP
- B. TTL
- C. Version
- D. S
- E. Length
- F. Label
- G. Type
- H. FCS

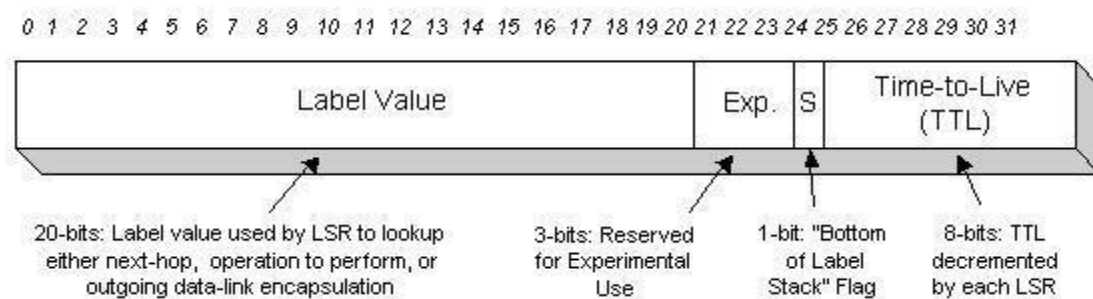
**Correct Answer:** ABDF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:



**QUESTION 24** Which two of the following statements are correct regarding LSPs? (Choose two.)

- A. An LSP is created for every routing protocol entry.
- B. Each LSP is bidirectional, that is, packets traveling in the opposite direction use the same LSP.
- C. An IGP is used to populate routing tables in all routers in an MPLS domain.
- D. LDP is used to propagate labels and build LSPs.
- E. The FIB is used to forward MPLS-labeled packets down an LSP.

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 25** Which four pieces of information are stored for each prefix in the LFIB? (Choose four.)

- A. local label
- B. outgoing label
- C. next-hop IP address
- D. outgoing interface
- E. incoming interface
- F. Layer 2 header rewrite information

**Correct Answer:** ABCD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Forwarding Labeled Packets

LSR forwards the packet based on:

Top Label value of the received packet

Corresponding entry in LFIB (LABEL <=> INTERFACE)

#show mpls forwarding-table - will show:

local        label

outgoing    label

prefix    (network)

outgoing interface

next-hop

```
Pomerol#show mpls forwarding-table
Local  Outgoing  Prefix      Bytes tag  Outgoing     Next Hop
tag    tag or VC  or Tunnel Id switched interface
16     Pop tag    10.1.1.12/30 636        Se3/0        point2point
17     Pop tag    10.10.10.1/32 0           Se3/0        point2point
18     21         10.10.10.4/32 0           Se3/0        point2point
19     Pop tag    10.1.1.0/30  0           Se4/0        point2point
       Pop tag    10.1.1.0/30  0           Se3/0        point2point
20     Pop tag    10.10.10.6/32 612        Se2/0        point2point
21     Pop tag    10.1.1.16/30  0           Se3/0        point2point
22     16         10.10.10.5/32 0           Se3/0        point2point
23     Pop tag    10.10.10.2/32 0           Se4/0        point2point
```

LSR expects packet to come with "top" label being "Local" (from show mpls forwarding-table).

If Outgoing label is "Aggregate", then that means that this is a summary route and more specific lookup is performed. If

LSR cannot find label/interface mapping in LFIB, then it drops the packet.

There are several "RESERVED" labels numbered from 0 to 15:

0 - explicit NULL - is used to preserve QoS info through EXP bits. It copies 'ip prec' or DiffServ. 1

- Router alert label - forces LSR to software switch the packet.

3 - Implicit NULL - this label is used for "connected" or "summary" routes. This way LSR signals its neighbors to execute "POP label" operation on "connected" routes. It is called PHP, Penultimate Hop Popping, and is used to make sure that LSR does not perform 2 lookups (label + ip).

14 - OEM alert label - is used for monitoring purpose.

In Cisco IOS, the default range is 16 through 100,000, but can be expanded by using "mpls label range" command.

#### QUESTION 26

Which three network services can be implemented using MPLS within the service provider IP NGN core? (Choose three.)

- A. Layer 2 VPNs
- B. Layer 3 VPNs
- C. traffic engineering
- D. IntServ traffic engineering tunnels
- E. encrypted LSPs



**Correct Answer:** ABC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 27** LDP session protection uses which one to maintain the LDP session between LDP neighbors?

- A. LDP NSF
- B. LDP NSR
- C. backup-targeted LDP hellos
- D. BFD
- E. LDP-IGP synchronization

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 28

You are tasked to enable LDP on many of the interfaces on the Cisco CRS-3 router, and because there are many interfaces that need to have LDP enabled, you mistakenly did not enable LDP on all the required interfaces. To prevent this issue from happening again in the future, what could you do the next time you need to enable LDP on many interfaces?

- A. use the mpls ldp auto-config command under the IGP routing process

- B. use the mpls ldp sync command under the IGP routing process
- C. use the interface all command under the MPLS LDP process
- D. use the discovery command under the MPLS LDP process

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 29** Which two statements are correct in describing ISP environments that are running IP/MPLS in the core network? (Choose two.)

- A. On the PE routers, each BGP route must use a unique label to reach the BGP next hop.
- B. The BGP next hops point to the PE routers, and only the PE routers are required to run BGP.
- C. A full mesh of IBGP sessions are required between all of the PE and P routers to ensure proper packets forwarding.
- D. The PE and P routers run LDP to learn the labels for reaching the BGP next-hop addresses.

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 30** When troubleshooting LDP operations on the Cisco IOS and IOS XE routers, what is one of the first things that should be verified?

- A. if running OSPF as the IGP, ensure that OSPFv3 has been enabled
- B. check if the ip cef command has been enabled
- C. verify in the running configurations that all of the required LDP interfaces are defined under the mpls ldp command configuration mode
- D. verify if there are any access lists that are denying TCP and UDP port 464 packets

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 31**

Referring to the Cisco IOS XR configuration exhibit,

```
mpls ldp
label
advertise
disable
for test1 to test2
!
ipv4 access-list test2
10 permit ipv4 any any
ipv4 access-list test1
10 permit ipv4 host 10.1.1.1 any
```

which labels will be advertised by the router with this configuration?

- A. Only the label for 10.1.1.1/32 will be advertised to all the LDP peers.
- B. Labels for all prefixes will be advertised to the 10.1.1.1 LDP peer.
- C. Labels for all prefixes will be advertised to all the LDP peers.



D. No labels will be advertised to any LDP peers.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 32** What is the term that is used for the label that an LSR assigns and distributes to other LSRs in MPLS?

- A. Local
- B. Remote
- C. Explicit
- D. Explicit Null
- E. Aggregate

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 33** Which Cisco IOS XR high-availability feature is used to prevent routes from being used before LDP converges?

- A. LDP session protection
- B. LDP-IGP synchronization
- C. BFD
- D. IGP session protection



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 34** Which Cisco IOS XR command should be used in order to enable LDP-IGP synchronization for the ISIS IGP protocol?

- A. RP/0/RSP0/CPU0:R1(config-isis-if-af)#mpls ldp sync
- B. RP/0/RSP0/CPU0:R1(config-isis)#mpls ldp sync
- C. RP/0/RSP0/CPU0:R1(config-ldp)#isis ldp sync
- D. LDP-IGP synchronization is not supported for the ISIS IGP protocol on Cisco IOS XR platforms

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 35**

Referring to the Cisco IOS XR show command output exhibit,

```
RP/0/RSP1/CPU0:ASR9006#sh mpls ldp igp sync
Bundle-Ether9000:
  Sync status: Ready
  Peers:
    192.168.1.25:0 (GR)
GigabitEthernet0/1/0/10:
  Sync status: Not ready
```

what are three possible reasons that the GigabitEthernet0/1/0/10 LDP IGP sync status is not ready? (Choose three.)

- A. GigabitEthernet0/1/0/10 is not configured to run LDP.
- B. Graceful restart is not configured on the peer.
- C. The LDP neighbor on GigabitEthernet0/1/0/10 is not up.
- D. The OSPF neighbor on GigabitEthernet0/1/0/10 is not up.
- E. LDP is up on GigabitEthernet0/1/0/10, but no label bindings have been received from the peer.
- F. GigabitEthernet0/1/0/10 is a member link of Bundle-Ether9000.

**Correct Answer:** CDE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 36** In which two Cisco IOS XR configuration modes can mpls ldp igp sync be configured? (Choose two.)

- A. config-ldp
- B. config-if
- C. config-ospf-ar
- D. config-ospf
- E. config-isis



**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 37** On Cisco routers, which three methods can be used to map traffic into the MPLS traffic engineering tunnel? (Choose three.)

- A. on-demand routing
- B. static routing
- C. optimized edge routing
- D. policy-based routing
- E. autoroute

**Correct Answer:** BDE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 38**

Which three statements are correct regarding a Cisco MPLS TE? (Choose three.)

- A. A Cisco MPLS TE tunnel maps onto an LSP path.
- B. Tunnels are bidirectional by default.
- C. Packets that are mapped into a Cisco MPLS TE tunnel will have two labels, with the top label indicating what the tail-end router should do with the packet.
- D. A tunnel that is created with a priority of 0 can pre-empt an existing tunnel with a priority of 7.
- E. CBR takes into account link resource and traffic tunnel attributes.
- F. RSVP is used between customer routers.

**Correct Answer:** ADE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 39** On a Cisco router, when will the router actually reserve the bandwidth for the MPLS traffic engineering tunnel?

- A. during the autoroute process
- B. during constraint-based routing calculations
- C. on the receipt of the RSVP Path message
- D. on the receipt of the RSVP Resv message

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 40** Cisco MPLS TE path setup can be affected by which three tunnel attributes? (Choose three.)

- A. bandwidth
- B. delay
- C. MTU
- D. priority
- E. affinity

**Correct Answer:** ADE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 41** When using the tunnel mpls traffic-eng path-option 1 explicit name test command in Cisco MPLS TE tunnel configurations, the test explicit-path configuration will consist of a list of which values?

- A. tunnel endpoint
- B. resource class affinity
- C. MPLS label
- D. IP address

**Correct Answer:** D

**Section:** (none)

**Explanation**



**Explanation/Reference:**

Explanation: tunnel mpls traffic-eng path-option

To configure a path option for a Multiprotocol Label Switching (MPLS) traffic engineering tunnel, use the tunnel mpls traffic-eng path-option command in interface configuration mode. To disable the specified path option, use the no form of this command. tunnel mpls traffic-eng path-option number {dynamic | explicit {name path-name | path-number}} [lockdown]  
no tunnel mpls traffic-eng path-option number {dynamic | explicit {name path-name | path-number}} [lockdown] Syntax Description number = When multiple path options are configured, lower numbered options are preferred. dynamic = Path of the LSP is dynamically calculated. explicit = Path of the LSP is an IP explicit path. name path-name = Path name of the IP explicit path that the tunnel uses with this option. path-number = Path number of the IP explicit path that the tunnel uses with this option. lockdown = (Optional) The LSP cannot be reoptimized.

Usage Guidelines

You can configure multiple path options for a single tunnel. For example, there can be several explicit path options and a dynamic option for one tunnel. Path setup preference is for lower (not higher) numbers, so option 1 is preferred.

Examples

The following example shows how to configure the tunnel to use a named IP explicit path: Router(config-if)#

tunnel mpls traffic-eng path-option 1 explicit name test

**QUESTION 42** Cisco MPLS TE resource attributes that are configured locally for each link are distributed to the headend router of the traffic engineering tunnel using which protocol?

- A. BGP
- B. MP-BGP
- C. LDP
- D. RSVP
- E. OSPF or IS-IS with TE extension

**Correct Answer:** E

**Section:** (none)

**Explanation**



**Explanation/Reference:**

**QUESTION 43**

When implementing Cisco MPLS TE, the constrained-based path calculations will use which value as the TE cost of each link within the MPLS domain?

- A. By default, it will use the IGP metric, or each link can be assigned a specific value using the admin-weight command.
- B. It can only use the IGP metric as the TE cost.
- C. It will use the interface bandwidth as the TE cost.
- D. Each link must be assigned a TE cost using the metric command.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 44**

Which affinity and mask value will match the link affinity that has 0x0F in the first 8 bits and 0x01 in the last 8 bits, and the middle 16 bits can be any value?

- A. affinity 0x0F000001 mask 0x0F000001
- B. affinity 0x0F000001 mask 0x00000000
- C. affinity 0x0F000001 mask 0x11111111 D. affinity 0x0F000001 mask 0x11000011
- E. affinity 0x0F000001 mask 0xFF0000FF F. affinity 0x0F000001 mask 0x00FFFF00

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 45** Which two features are used to provide Cisco MPLS TE node and link protection? (Choose two.)

- A. autoroute
- B. fast reroute
- C. backup tunnels
- D. BFD

**Correct Answer:** BC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 46** In Cisco MPLS TE implementations, what can cause the tunnel bandwidth to adjust automatically based on the traffic load in the tunnel?

- A. fast reroute
- B. admin weight
- C. autobandwidth
- D. bandwidth subpool

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 47** Which affinity value will be matched by the affinity bit mask of the affinity 0xFF00000A mask 0xFFFF000F command?

- A. 0xFFFF000A
- B. 0xFF00EEEE
- C. 0xFF000000
- D. 0x00000000
- E. 0x11110001

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

0xFF00000A 11111111000000000000000000001010

0xFFFF000F 11111111111111110000000000001111

0xFF00EEEE 11111111000000001110111011101010

**QUESTION 48**

Refer to the Cisco IOS XR configuration exhibit.



```
interface Tunnel-te 10
ipv4 unnumbered Loopback0
destination 10.5.5.5
signalled-bandwidth 1000
priority 7 7
path-option 1 explicit name testpath
!
explicit-path name testpath
index 1 next-address ipv4 unicast 10.3.3.3
index 2 next-address ipv4 unicast 10.4.4.4
!
mpls traffic-eng
interface GigabitEthernet 0/0/0/10
backup-path tunnel-te 10
```

Which statement is correct?

- A. The backup tunnel-te 10 tunnel is using the highest setup and hold priority settings of 7.
- B. The backup tunnel path is learned dynamically.
- C. The fast-reroute command is missing under the (config-mpls-te-if)# configuration mode.
- D. Interface gi0/0/0/10 is the protected link.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 49** When defining an explicit MPLS TE tunnel path, which two command options are available under the explicit-path configuration mode? (Choose two.)

- A. exclude-address
- B. include-address
- C. next-address
- D. dynamic-address

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 50**

Which three mechanisms are used to implement MPLS TE? (Choose three.)

- A. tunnel interface
- B. CSPF
- C. RSVP
- D. LDP
- E. MP-BGP

**Correct Answer:** ABC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:



Constrained-Based Shortest Path First (CSPF).

Resource Reservation Protocol - Traffic Engineering is an extension of the resource reservation protocol (RSVP) for traffic engineering.

**QUESTION 51** Implementing IPoDWDM interfaces on Cisco CRS routers eliminates the need for which network component?

- A. ROADM
- B. external transponders
- C. electrical-optical-electrical converters
- D. electrical cross-connect

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

IP over DWDM (IPoDWDM) is a technology used in telecommunications networks to integrate IP Routers and Switches in the OTN (Optical Transport Network).

**QUESTION 52** Layer 2 VPN services that are offered by traditional service providers using a SONET/SDH backbone can be implemented by service providers using an IP/MPLS backbone with which MPLS feature?

- A. LSP stitching
- B. AToM
- C. virtual private WAN services
- D. cell-mode MPLS

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 53** On Cisco routers, which QoS marker is only locally significant?

- A. DSCP
- B. MPLS EXP
- C. IP precedence
- D. QoS group
- E. discard eligible (DE)

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 54**

Which QoS mechanism is used for congestion avoidance?

- A. LLQ
- B. CBWFQ
- C. WRED
- D. LFI
- E. traffic policing



**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 55

Only based on the Cisco IOS XR policy-map configuration exhibit,

```
policy-map policy_A
class test
  bandwidth 1000000
  random-detect dscp AF11 10000 20000
  random-detect dscp AF41 12000 24000
```

which statement is correct?

- A. All DSCP AF41 marked packets will be dropped when the average queue length reaches 12,000 packets.
- B. DSCP AF11 marked packets will be randomly dropped when the average queue length reaches 10,000 packets.
- C. DSCP AF11 and AF41 marked packets are guaranteed a minimum bandwidth of 1 Mb/s.
- D. DSCP AF11 and AF41 marked packets are guaranteed a maximum bandwidth of 1 Mb/s.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 56

Referring to the show output exhibit, which statement is correct?

```
RP/0/RSP0/CPU0:P1# show mpls ldp bindings

10.7.1.1/32, rev 61
Local binding: label: 16008
Remote bindings: (2 peers)
Peer      Label
-----
10.0.2.1:0 16013
10.7.1.1:0  IMP-NUL

10.7.10.1/32, rev 85
Local binding: label: 16009
Remote bindings: (1 peer)
Peer      Label
-----
10.0.2.1:0 16022
```

- A. The P1 router is receiving label information for the 10.0.2.1/32 prefix from two LDP peers.
- B. The P1 router is receiving label information for the 10.7.1.1/32 prefix from two LDP peers.
- C. The P1 router is using the IMP-NUL local label for the 10.7.1.1/32 prefix because 10.7.1.1/32 is the loopback interface IP address on the P1 router.
- D. The P1 router will perform PHP for the 10.7.1.1/32 and 10.7.10.1/32 prefixes.

**Correct Answer:** B

**Section:** (none)

**Explanation**



Explanation/Reference:

#### QUESTION 57

Referring to the traceroute output exhibit that is shown,

```
pe1#traceroute 14.14.14.14
Type escape sequence to abort.
Tracing the route to 14.14.14.14
 0 37.37.37.1 [MPLS: Label 66 Exp 0] 40 msec 24 msec 28 msec
 1 78.78.78.2 [MPLS: Label 99 Exp 0] 28 msec 32 msec 28 msec
 2 181.181.181.1 [MPLS: Label 99 Exp 0] 36 msec 24 msec 24 msec
 3 110.110.110.1 28 msec 28 msec 28 msec
 4 103.103.103.2 [MPLS: Label 66 Exp 0] 28 msec 28 msec 24 msec
 5 135.135.135.2 28 msec 28 msec *
```

which statement is correct?

- A. There is no problem with the end-to-end LSP as indicated by the successful trace.
- B. Normal PHP operation is performed by the hop 4 router.
- C. The end-to-end LSP is broken at hop 4.
- D. At each hop, each LSR is able to perform label swapping.

**Correct Answer:** C

**Section:** (none)

**Explanation**

Explanation/Reference:

**QUESTION 58** What is an important requirement with MPLS applications like Layer 3 MPLS VPNs?

- A. All the PE routers loopback addresses should be summarized to reduce the number of routing table entries in the core routers.
- B. Targeted hellos are required between all the PE routers.
- C. An end-to-end LSP is required between the PE routers.
- D. The LSPs that are built between the PE routers must be symmetrical (bidirectional).

**Correct Answer:** C

**Section:** (none)

**Explanation**

Explanation/Reference:

#### QUESTION 59

When implementing MPLS TE tunnels on Cisco IOS XR routers, what is the tunnel setup and hold priority value range, and which value has the highest priority?

- A. 0-63, where 0 is the highest priority
  - B. 0-63, where 63 is the highest priority
  - C. 0-7, where 0 is the highest priority
  - D. 0-7, where 7 is the highest priority
- Correct Answer:** C

**Section:** (none)

**Explanation**

Explanation/Reference:

**QUESTION 60** Which Cisco IOS XR command should be used in order to enable LDP on all interfaces for which the IGP protocol is enabled?

- A. RP/0/0/CPU0:R1(config-ospf)#mpls ldp auto-config
- B. RP/0/0/CPU0:R1(config-ospf)#mpls ldp interface all enable
- C. RP/0/0/CPU0:R1(config-ospf)#enable all
- D. RP/0/0/CPU0:R1(config-ldp)#enable all

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 61**

Refer to the partial Cisco IOS XR configurations exhibit for Router 1 and Router 2.



```
RP/0/RP0/CPU0:Router1#show running-config mpls ldp

mpls ldp
router-id 33.33.33.33
log
 adjacency
!
interface GigabitEthernet0/2/0/6
!

RP/0/RP1/CPU0:Router2#show running-config mpls ldp

mpls ldp
router-id 10.12.0.3
log
 neighbor
!
interface GigabitEthernet0/0/2/2
!

RP/0/RP0/CPU0:Router1#show running-config router ospf

router ospf test
area 0
 interface Loopback7
  passive enable
!

RP/0/RP1/CPU0:Router2#show running-config router ospf

router ospf test
area 0
 interface Loopback0
  passive enable
!
 interface GigabitEthernet0/0/2/2
!
```



There are two routers that are connected back to back over the Gigabit Ethernet link. If the "show mpls ldp neighbor" command output on Router 1 does not show LDP peering with Router 2, what could be the possible root cause of the LDP peering problem?

- A. missing interface under OSPF IGP configuration
- B. hello timers mismatch on Router 1 and Router 2
- C. password for LDP session mismatch on Router 1 and Router 2
- D. MPLS LDP session protection is not configured

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 62** Which Cisco IOS XR command should be used to identify if MPLS TE FRR is enabled?

- A. show mpls traffic-eng tunnel <tunnel#>
- B. show mpls frr

- C. show mpls traffic-eng protection
- D. show mpls protection
- E. show mpls fast-reroute

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The MPLS Traffic Engineering (TE)—Fast Reroute (FRR) Link and Node Protection feature provides link protection (backup tunnels that bypass only a single link of the label-switched path (LSP)), node protection (backup tunnels that bypass next-hop nodes along LSPs), and the following FRR features:

- Backup tunnel support
- Backup bandwidth protection
- Resource Reservation Protocol (RSVP) Hellos

Prerequisites for MPLS Traffic Engineering (TE)—Fast Reroute (FRR) Link and Node Protection

Your network must support the following Cisco IOS features:

- IP Cisco Express Forwarding
- Multiprotocol Label Switching (MPLS)

Your network must support at least one of the following protocols:

- Intermediate System-to-Intermediate System (IS-IS)
- Open Shortest Path First (OSPF)

Before configuring FRR link and node protection, it is assumed that you have done the following tasks but you do not have to already have configured MPLS TE tunnels: •Enabled

MPLS TE on all relevant routers and interfaces

- Configured MPLS TE tunnels

**QUESTION 63** When a link flaps, an mpls ldp session will also flap. Which feature minimizes traffic loss and provides faster convergence after the link is re-established?

- A. BFD
- B. MPLS LDP IGP SYNC
- C. graceful restart
- D. LDP session protection
- E. LDP nonstop routing

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 64** A DSCP value of 41 in decimal corresponds to which IP precedence value?

- A. 3 – Flash
- B. 4 – Flash Override
- C. 5 – Critical
- D. 6 – Internet Control
- E. 7 – Network Control

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

= INT(41/8)



The AF behavior group defines four separate AF classes with Class 4 having the highest priority. Within each class, packets are given a drop precedence (high, medium or low). The combination of classes and drop precedence yields twelve separate DSCP encodings from AF11 through AF43 (see table)

Assured Forwarding (AF) Behavior Group

	Class 1 (lowest)	Class 2	Class 3	Class 4 (highest)
Low Drop	AF11 (DSCP 10)	AF21 (DSCP 18)	AF31 (DSCP 26)	AF41 (DSCP 34)
Med Drop	AF12 (DSCP 12)	AF22 (DSCP 20)	AF32 (DSCP 28)	AF42 (DSCP 36)
High Drop	AF13 (DSCP 14)	AF23 (DSCP 22)	AF33 (DSCP 30)	AF43 (DSCP 38)

#### QUESTION 65

DRAG DROP

Referring to Cisco MPLS TE path setup operations using RSVP, drag the RSVP characteristic on the left to match the correct RSVP message type on the right **Select**

**and Place:**

sent from the tunnel headend to the tunnel tailend	<b>RSVP PATH Message</b> <div>Target</div>
sent from the tunnel tailend to the tunnel headend	<div>Target</div>
carries the MPLS label requests	<b>RSVP RESV Message</b> <div>Target</div>
carries the MPLS labels	<div>Target</div>

**Correct Answer:**



Section: (none)  
Explanation

Explanation/Reference:

#### QUESTION 66

DRAG DROP



Drag each of the QoS mechanisms on the left to match the correct description on the right. (Not all options on the left are used.)

Select and Place:

LLQ	Can drop excess traffic beyond the committed rate and remark nonconforming traffic before transmitting it
LFI	Use to avoid the TCP global synchronization problems that occur when tail drop is used as the congestion avoidance mechanism
traffic shaping	Provide a strick priority queue to allow delay-sensitive data such as voice to be dequeued and sent first
WRED	Excess traffic beyond the committed rate will be queued and scheduled for later transmission. Only applied in the output direction
CBWFQ	
traffic policing	
WFQ	

Correct Answer:

	traffic policing
LFI	WRED
	LLQ
	traffic shaping
CBWFQ	
WFQ	

Section: (none)

Explanation

Explanation/Reference:



#### QUESTION 67

DRAG DROP

Drag the Cisco MQC configuration task on the left to match the correct description on the right. (Not all options on the left are required.)

Select and Place:

class-map	applies the QoS policy to an interface
tcp-map	defines the PHB QoS action(s) for each of the different traffic classes
route-map	defines the matching parameter(s) for classifying packets into service classes
policy-map	
service-policy	
route-policy	
qos-group	

Correct Answer:

	service-policy
tcp-map	policy-map
route-map	class-map
route-policy	
qos-group	

Section: (none)  
Explanation

Explanation/Reference:

QUESTION 68  
DRAG DROP

Put the MPLS LDP steps on the left into the correct order from top to bottom on the right **Select**  
**and Place:**

Build RIB	Target
Build LFIB	Target
Assign Labels	Target
Advertise Labels	Target

Correct Answer:

	Build RIB
	Assign Labels
	Advertise Labels
	Build LFIB

Section: (none)  
Explanation

Explanation/Reference:

**QUESTION 69**  
DRAG DROP

Drag the QoS model on the left to match its correct description on the right

**Select and Place:**

DiffServ	All network packets are treated exactly the same
IntServ	It divides traffic into classes and applies a different level of service for each class
Best Effort	Traffic-handling characteristics are based on signaling events from network-based applications

Correct Answer:

	Best Effort
	DiffServ
	IntServ



Section: (none)  
Explanation

Explanation/Reference:

**QUESTION 70**  
DRAG DROP

Drag the MPLS Diff-Serv tunneling mode on the left to match the correct description on the right

Select and Place:



Pipe Mode	If a QoS marking (MPLS EXP) is changed in the MPLS network, it is also changed in the egress IP packet
Short-Pipe Mode	This provides QoS transparency where the customer QoS marking (f.e., DSCP) in the IP packet is preserved. The egress PE uses the original customer QoS marking instead of the service provider QoS marking
Uniform Mode	QoS is done on the output interface of the PE router that is based on the received MPLS EXP field. The customer QoS marking (f.e., DSCP) isn't altered when the customer packet travels from the ingress to the egress of the MPLS domain

Correct Answer:

	Uniform Mode
	Short-Pipe Mode
	Pipe Mode

Section: (none)

Explanation

Explanation/Reference:

#### QUESTION 71

Instructions:

Enter the proper CLI command and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

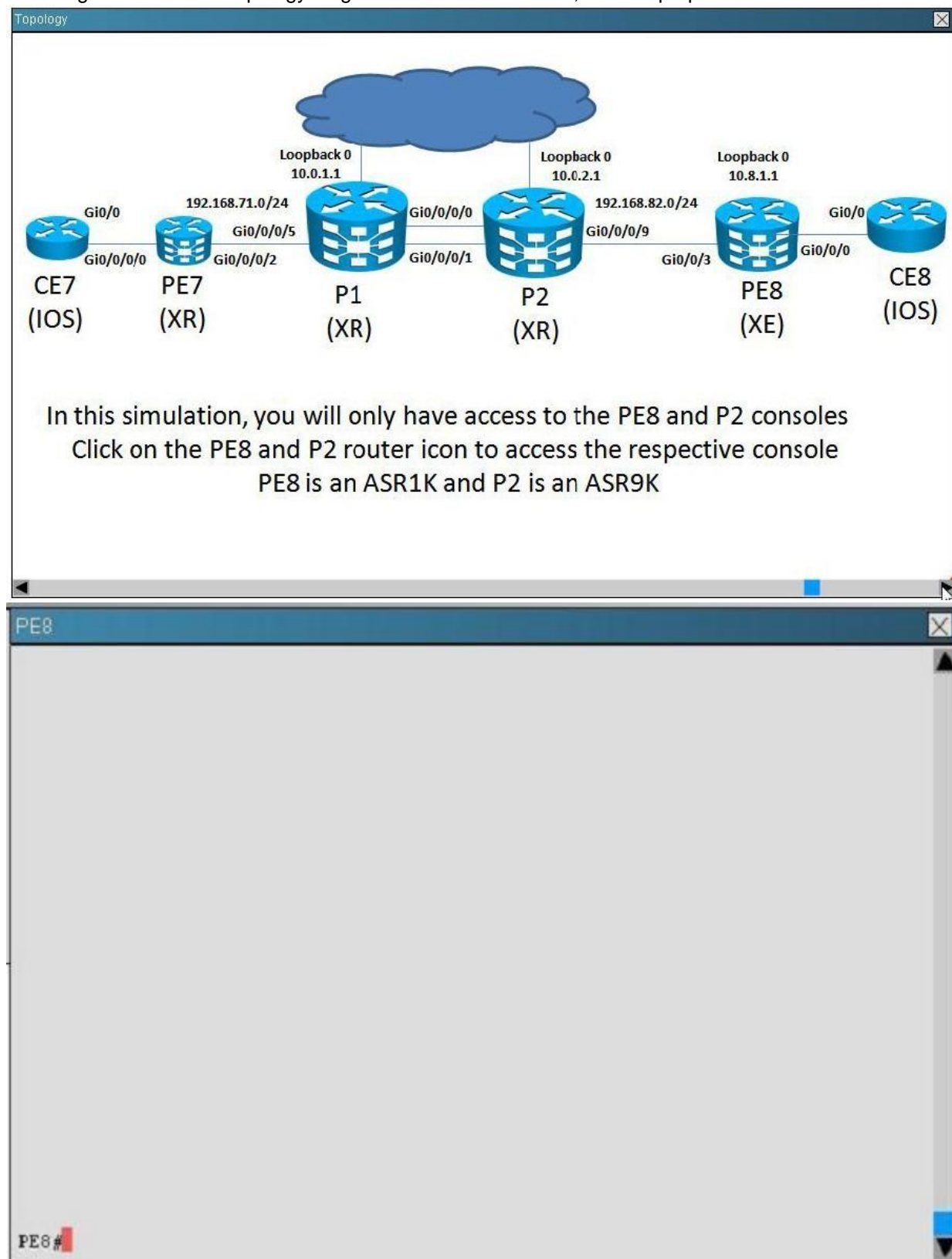
There are **four** multiple-choice questions with this task. Be sure to answer all **four** questions before selecting the Next button.

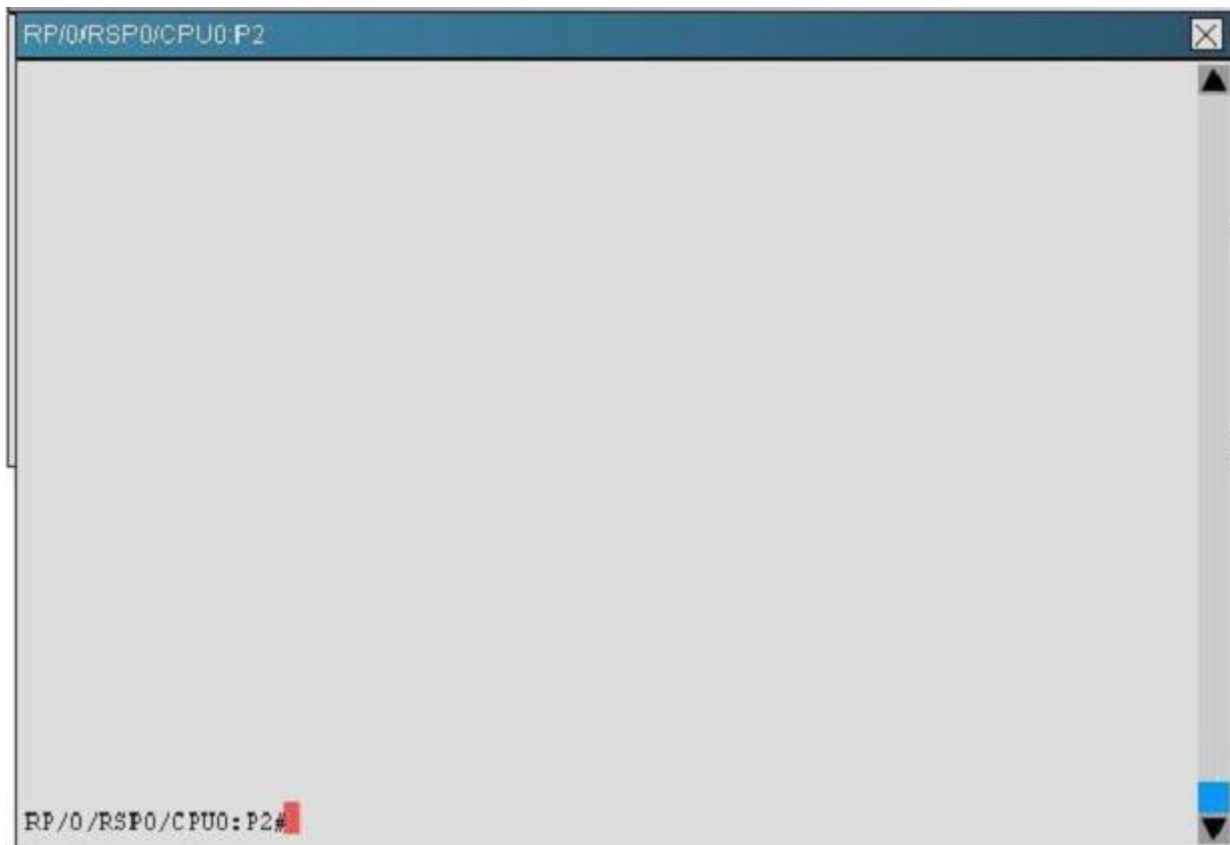
Not all the CLI commands or commands options are supported or required for this simulation.

For example, the show running-config command is **NOT** supported in this simulation.

All the devices in this stimulation have been pre-configured and you are not required to enter in any configurations.

Scenario:  
Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the PE8 and P2 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.





On the PE8-router what is the label value used to reach the 10.7.1.1/32 network prefix?

- A. 10.0.2.1:0
- B. imp-null
- C. 16024
- D. 128



**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**Issue on PE8: show mpls forwarding-table**

Look for the "Outgoing Label" not the "Local Label" for the prefix 10.7.1.1/32. You will notice that the Label value is 16024.

## QUESTION 72

Instructions:

Enter the proper CLI command and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

There are **four** multiple-choice questions with this task. Be sure to answer all **four** questions before selecting the Next button.

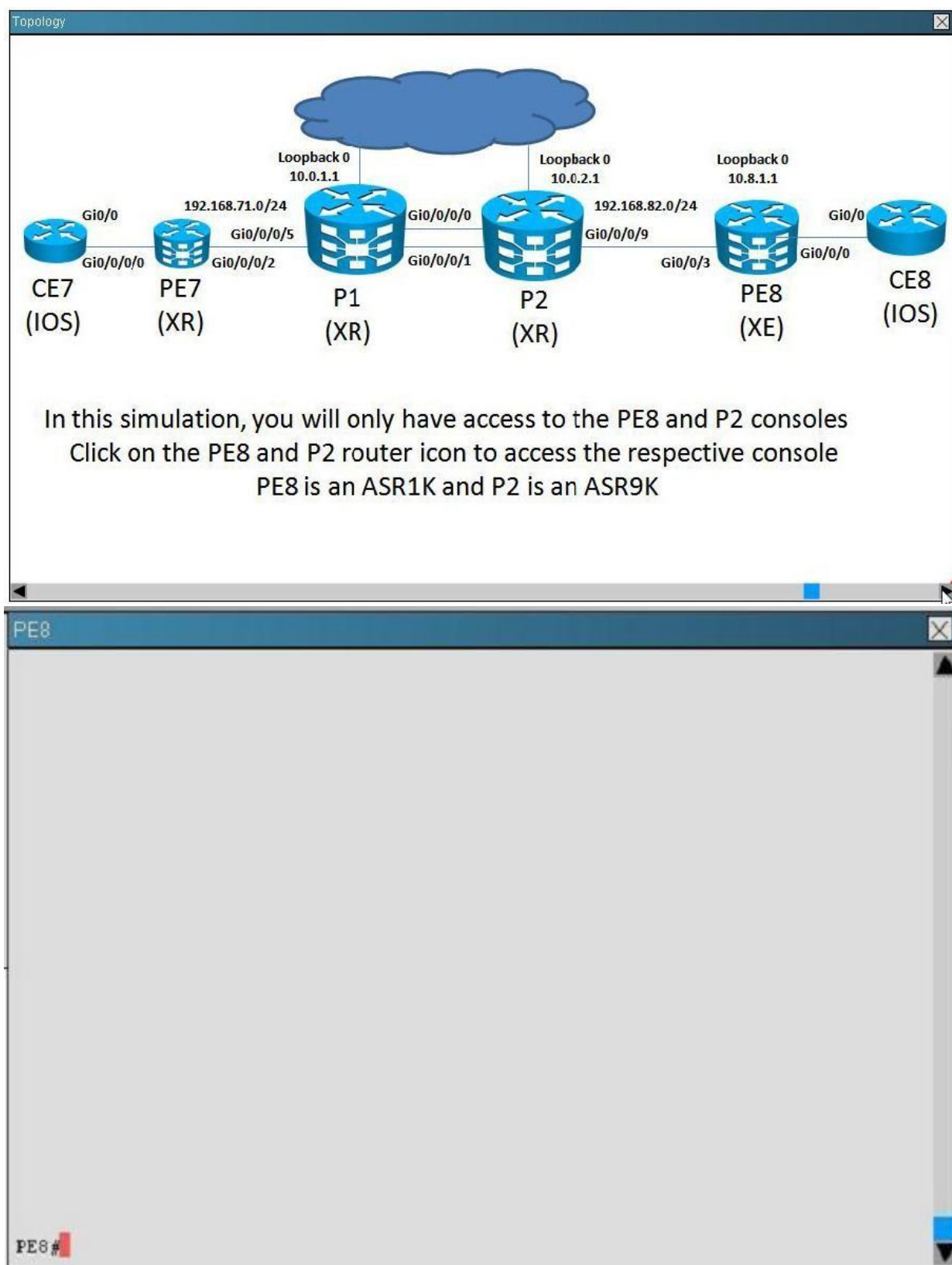
Not all the CLI commands or commands options are supported or required for this simulation.

For example, the show running-config command is **NOT** supported in this simulation.

All the devices in this stimulation have been pre-configured and you are not required to enter in any configurations.

Scenario:

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the PE8 and P2 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.





On P2IOS-XR router what is targeted LDP hellos hold time on LDP session with 10.0.1.1:0 LDP ID?

- A. 90 sec
- B. 10 sec
- C. 3 sec
- D. 8.6 sec



**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Issue on P2: show mpls ldp discovery (details).

Ps: The command show mpls ldp parameter is not Implemented.

Look at the end, you will see the hello and the holdtime values for the target neighbour. Be careful he is asking for "targeted LDP hellos hold time". No other command will work!!! At the end of the show result you will see something looks like the following:

LDP discovery sources:

Targeted Hello 10.0.2.1 -> 10.0.1.1 active, passive;

Hello: 30 sec

holdtime: 90 sec

### QUESTION 73

Instructions:

Enter the proper CLI command and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

There are **four** multiple-choice questions with this task. Be sure to answer all **four** questions before selecting the Next button.

Not all the CLI commands or commands options are supported or required for this simulation.

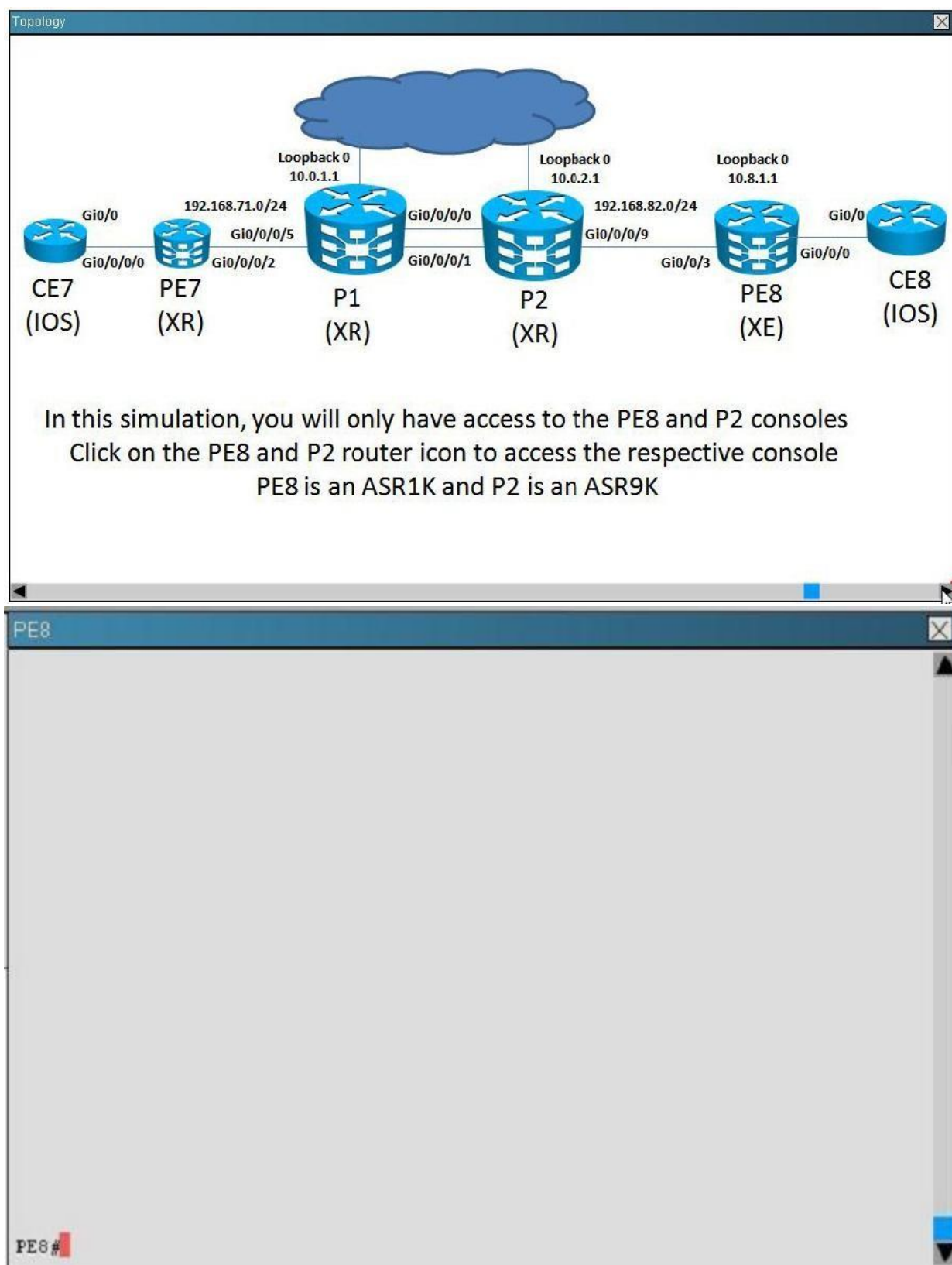
For example, the show running-config command is **NOT** supported in this simulation.

All the devices in this stimulation have been pre-configured and you are not required to enter in any configurations.

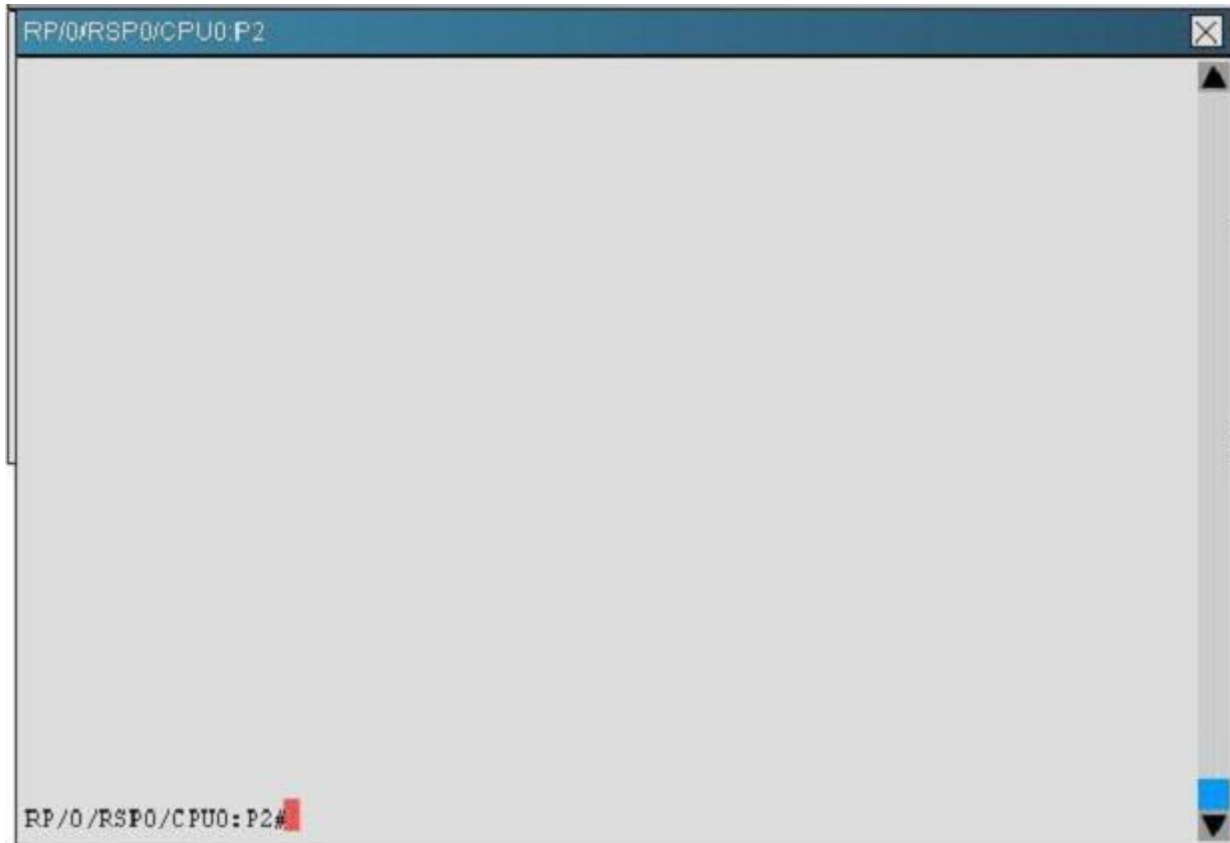
Scenario:

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the PE8 and P2 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.









From PE8 router, what is the label action used to reach the P2 loopback 0 interface 10.0.2.1/32?

- A. Swap label 35 with label 16004
- B. Push label 16004
- C. Pop label 35
- D. Pop label 16009
- E. Push Label 16009
- F. Swap label 35 with label 16009



**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

show mpls forwarding-table , find prefix 10.0.2.1 and you will see there under outgoing Label "Pop Label" (This is actually logic because the prefix is directly connected and therefore the packet will forward without label). If the router should forward any packet to that prefix, the packet should be received with Local label on PE8 (Local Label = 35), the router will remove it and forward it without Label.

#### QUESTION 74

Instructions:

Enter the proper CLI command and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

There are **four** multiple-choice questions with this task. Be sure to answer all **four** questions before selecting the Next button.

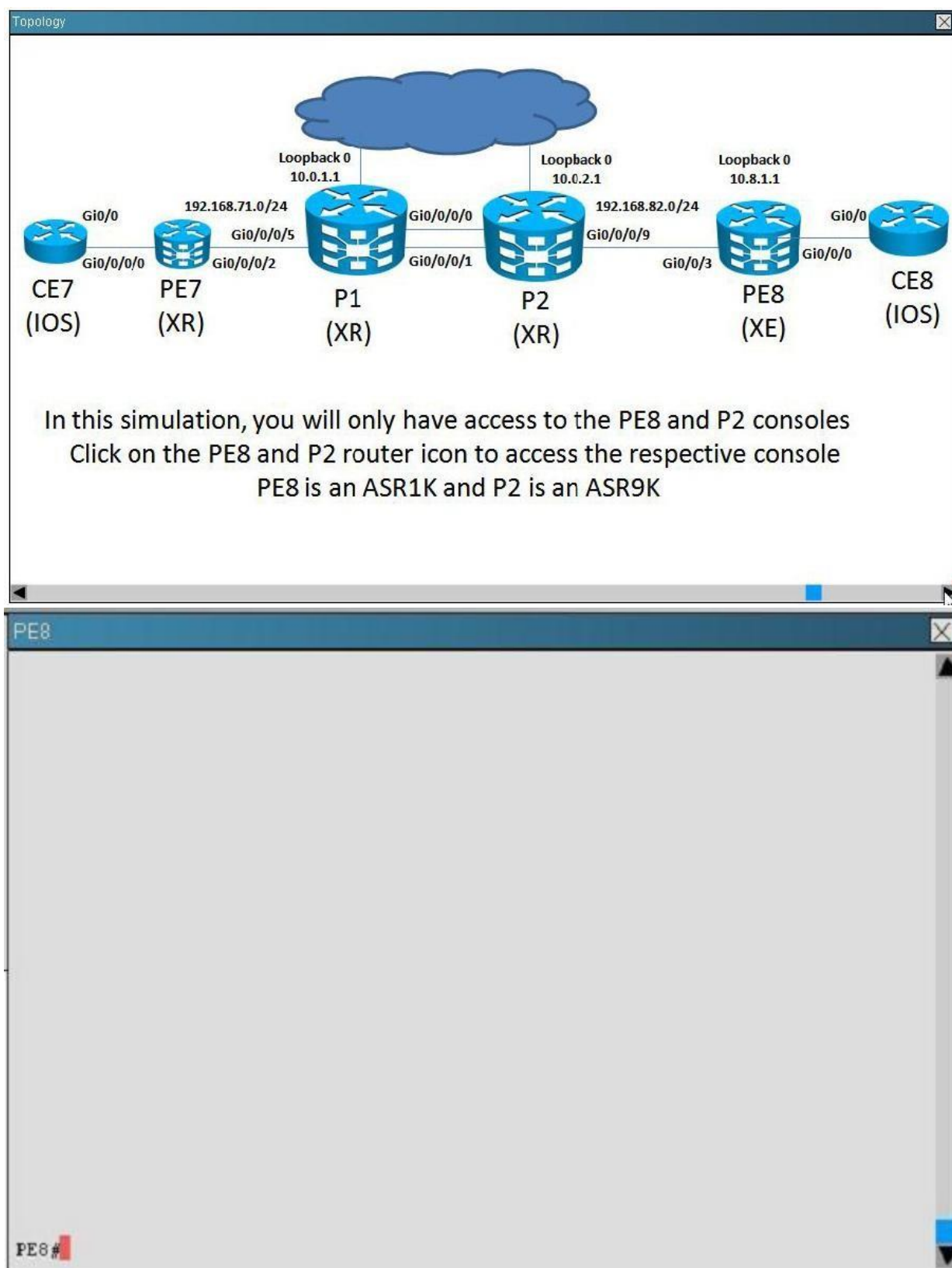
Not all the CLI commands or commands options are supported or required for this simulation.

For example, the show running-config command is **NOT** supported in this simulation.

All the devices in this stimulation have been pre-configured and you are not required to enter in any configurations.

Scenario:

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the PE8 and P2 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.





From the PE8 router, how many total prefixes for have an incoming local label assigned (including the imp-null)?

- A. 45
- B. 21
- C. 66
- D. 22



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

On PE8 issue: show mpls ip binding summary and look at "assigned in labels". That value is the correct answer NOT "learned out label".

```
Router# show mpls forwarding-table
```

Local Label	Outgoing Label or VC	Prefix or Tunnel Id	Bytes switched	label interface	Outgoing Next Hop
26	No Label	10.253.0.0/16	0	Et4/0/0	10.27.32.4
28	1/33	10.15.0.0/16	0	AT0/0.1	point2point
29	Pop Label	10.91.0.0/16	0	Hs5/0	point2point
	1/36	10.91.0.0/16	0	AT0/0.1	point2point
30	32	10.250.0.97/32	0	Et4/0/2	10.92.0.7
	32	10.250.0.97/32	0	Hs5/0	point2point
34	26	10.77.0.0/24	0	Et4/0/2	10.92.0.7
	26	10.77.0.0/24	0	Hs5/0	point2point
35	No Label[T]	10.100.100.101/32	0	Tu301	point2point
36	Pop Label	10.1.0.0/16	0	Hs5/0	point2point
	1/37	10.1.0.0/16	0	AT0/0.1	point2point

```
Router# show mpls ldp bindings
```

```
10.0.0.0/8, rev 9
  local binding: label: imp-null
  remote binding: lsr: 10.10.0.55:0, label: 17
  remote binding: lsr: 10.66.0.66:0, label: 18
  remote binding: lsr: 10.0.0.44:0, label: imp-null
172.16.0.0/8, rev 17
  local binding: label: 19
  remote binding: lsr: 10.0.0.55:0, label: imp-null
  remote binding: lsr: 10.66.0.66:0, label: 16
  remote binding: lsr: 10.0.0.44:0, label: imp-null
192.168.0.66/32, rev 19
  local binding: label: 20
  remote binding: lsr: 10.0.0.55:0, label: 19
  remote binding: lsr: 10.66.0.66:0, label: imp-null
  remote binding: lsr: 10.0.0.44:0, label: 18
```



```
Router# show mpls ip binding summary
```

```
Total number of prefixes: 53
```

```
Generic label bindings
```

prefixes	assigned in labels	learned out labels
53	53	51

```
ATM label bindings summary
```

interface	total	active	local	remote	Bwait	Rwait	IFwait
ATM1/0.8	47	47	40	7	0	0	0

```
Router#
```

## QUESTION 75

Instructions:

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

There are four multiple-choice questions with this task. Be sure to answer all four questions before selecting the Next button.

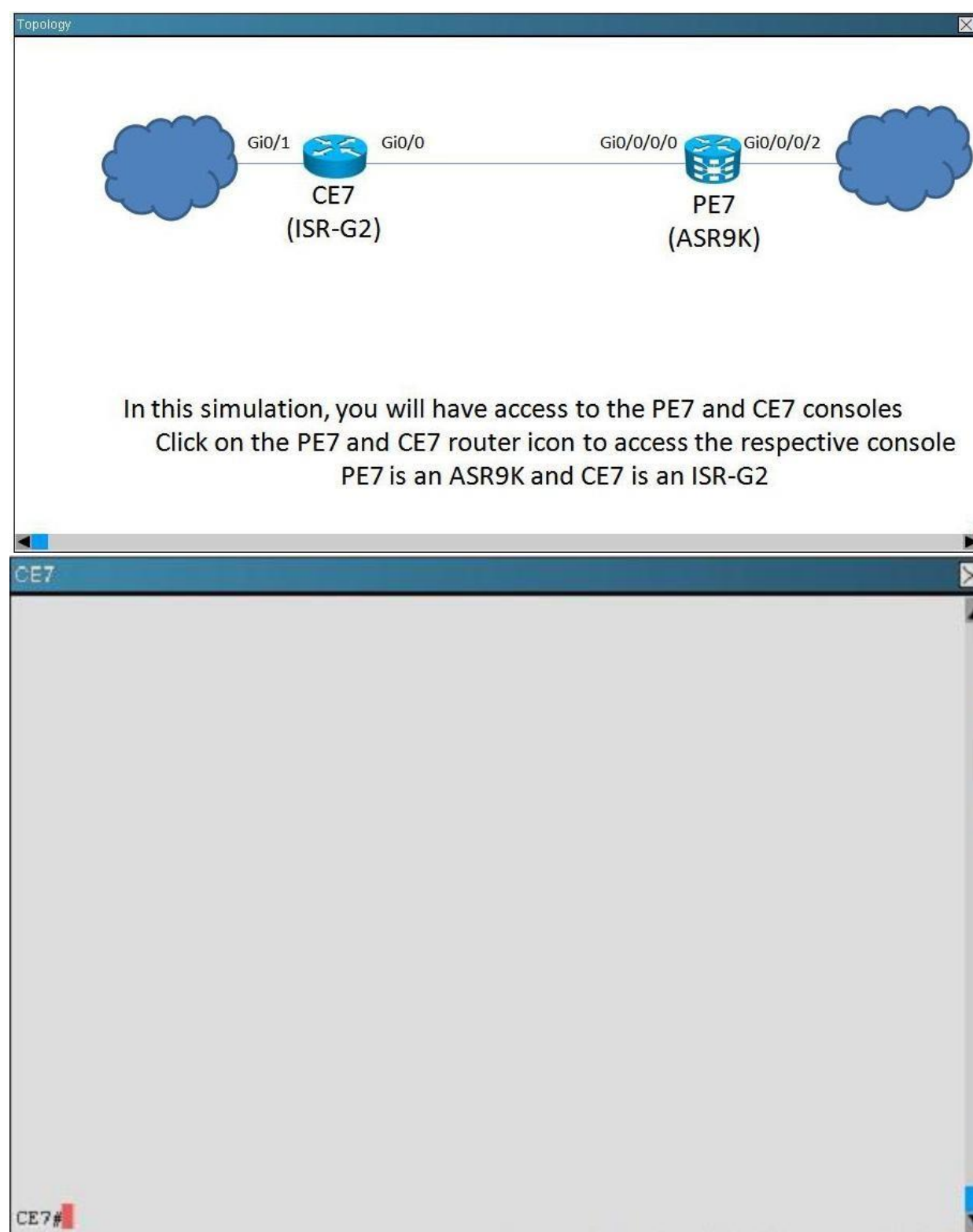
Not all the CLI commands or commands options are supported or required for this simulation.

All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

Scenario:

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.







On CE 7 router, which statement is correct regarding the "QOS-POLICY policy map configurations?

- A. Traffic matched by the "QOS-HTTP-1" class-map is shaped to an average rate of 2560000 128000bps
- B. Traffic matched by the "QOS1-HTTP-2" class-map will be queued in the low-latency-queue which has a maximum bandwidth guarantee of 64000C. Traffic matched by the "QOS-FTP-1" class-map can't use more than 256 Kbps under any condition D. The "QOS-POLICY is applied to the gi0/0 interface in the input direction

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:  
 # show policy-map  
 # show policy-map interface x/y  
 # show running-config policy-map

#### QUESTION 76

Instructions:

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

There are four multiple-choice questions with this task. Be sure to answer all four questions before selecting the Next button.

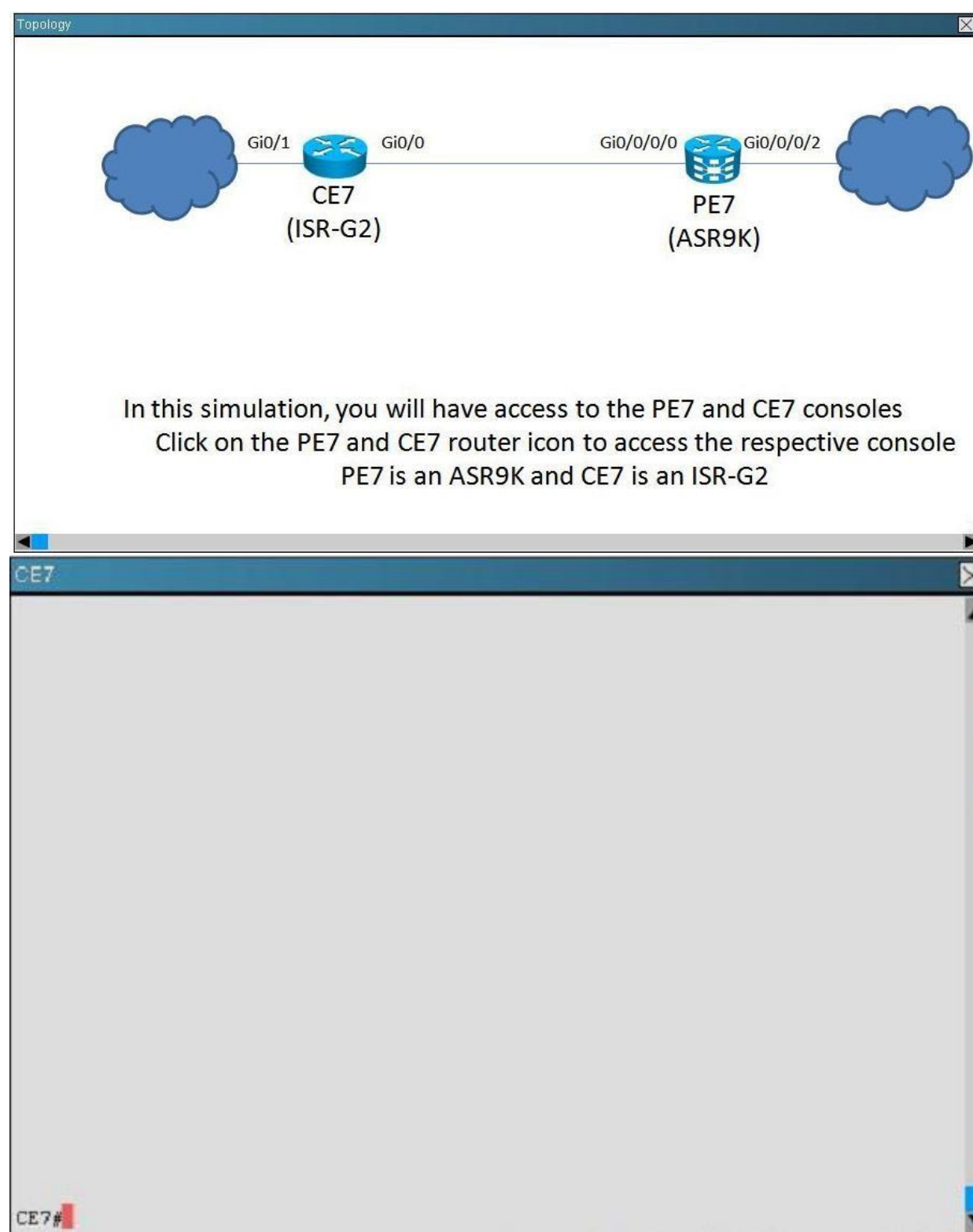
Not all the CLI commands or commands options are supported or required for this simulation.

All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

Scenario:

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.







After reviewing present router configuration CE7 which two statements are correct regarding behavior of the "llq" policy-map? (Choose 2)

- A. Traffic matched by the "cisco1" class-map will be assigned to the priority queue.
- B. The "llq" QoS policy is applied to the gi0/0 interface in the output direction
- C. Traffic matched by the "cisco2" class-map has a maximum bandwidth of 30%
- D. Traffic matched by the "cisco3" class-map has no priority and has a minimum bandwidth guarantee of 20%
- E. There are no packets being matched by the "class-default" traffic class in the "llq" policy

**Correct Answer:** AD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

You will notice that "cisco1" class map is assigned to the priority queue (the command is configured under policy-map llq class cisco1 priority xxx) "cisco2"

class map: is indeed configured using bandwidth 30%, however that defines the minimum bandwidth but not the maximum.

"cisco3" class map: is indeed configured using "bandwidth 20%", No priority configured and that will define the minimum guaranteed bandwidth.

The last choice is wrong! check under "show policy-map interface" There are 4 or more packets being matched by the "class-default" traffic class in the "llq" policy. Class-map:

class-default (match-any)

4 packets, 968 bytes

**QUESTION 77**

Instructions:

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

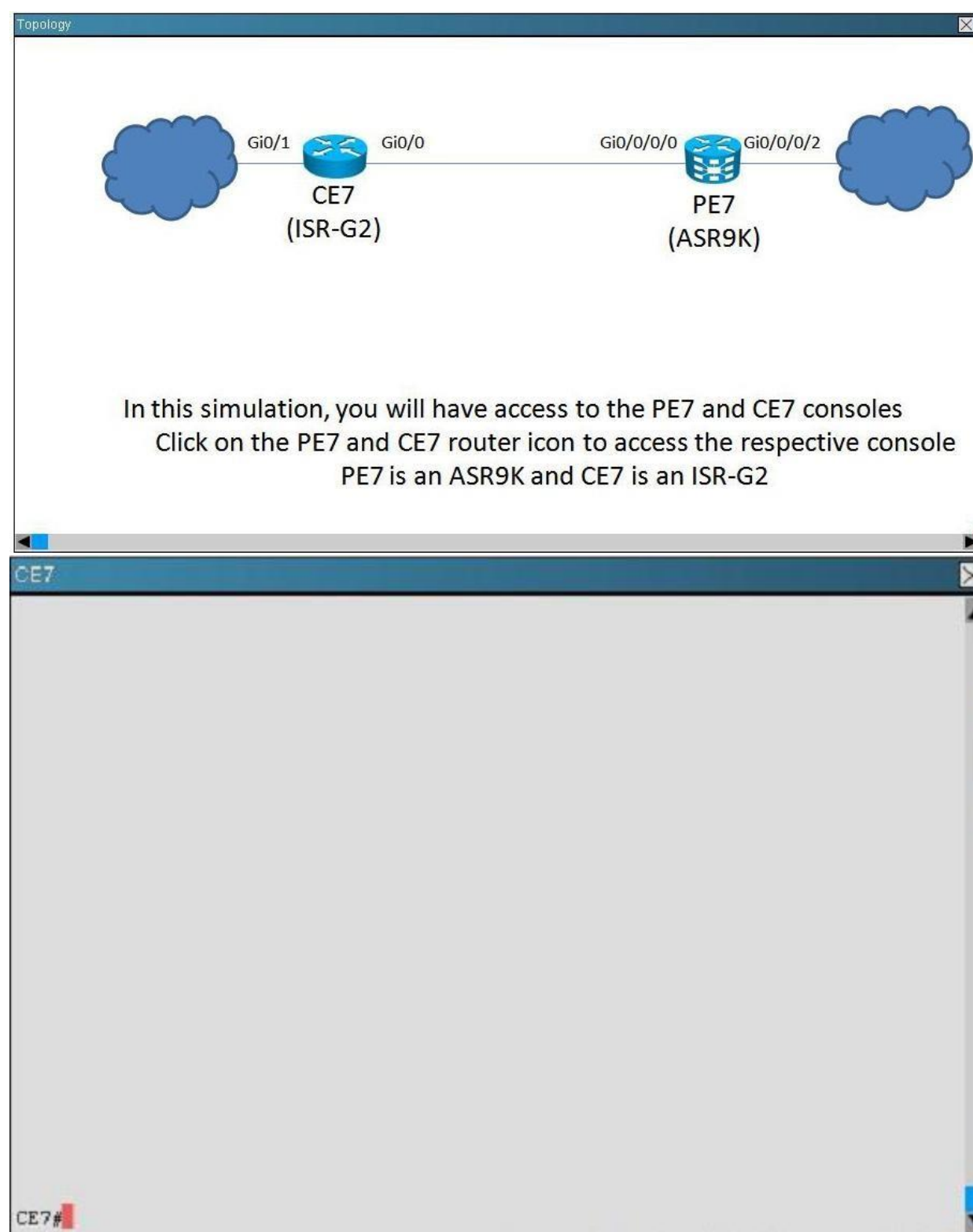
There are four multiple-choice questions with this task. Be sure to answer all four questions before selecting the Next button.

Not all the CLI commands or commands options are supported or required for this simulation.

All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

Scenario:

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.





On CE7 which statement is correct regarding Traffic the QoS policy applied to the gi0/0 interface in the input direction?

- A. Traffic matching the "MARKING2" class-map will be marked with qos-group 5
- B. Traffic matching the "MARKING1" class-map will be marked with MPLS EXP 5
- C. All incoming packets not matched by the "MARKING1" class-map will be dropped
- D. All incoming packets with the DSCP EF marking will be marked with MPLS EXP 0



**Correct Answer: B**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Issue: show policy-map interface gi0/0

First find out which policy-map is applied (it called something like QOSPOLICY1)

A is wrong. Class MARKING2 is indeed defined but not applied to that policy-map. There are two class-maps applied MARKING1 and class-default. Both will mark the traffic with MPLS EXP values.

default:

set mpls experimental imposition 0

MARKING1

set mpls experimental imposition 5

#### QUESTION 78

Instructions:

Enter the proper CLI commands and analysis the outputs on the Cisco routers to answer the multiple-choice questions.

From the network topology diagram, click on the router icon to gain access to the console of the router.

No console or enable passwords are required.

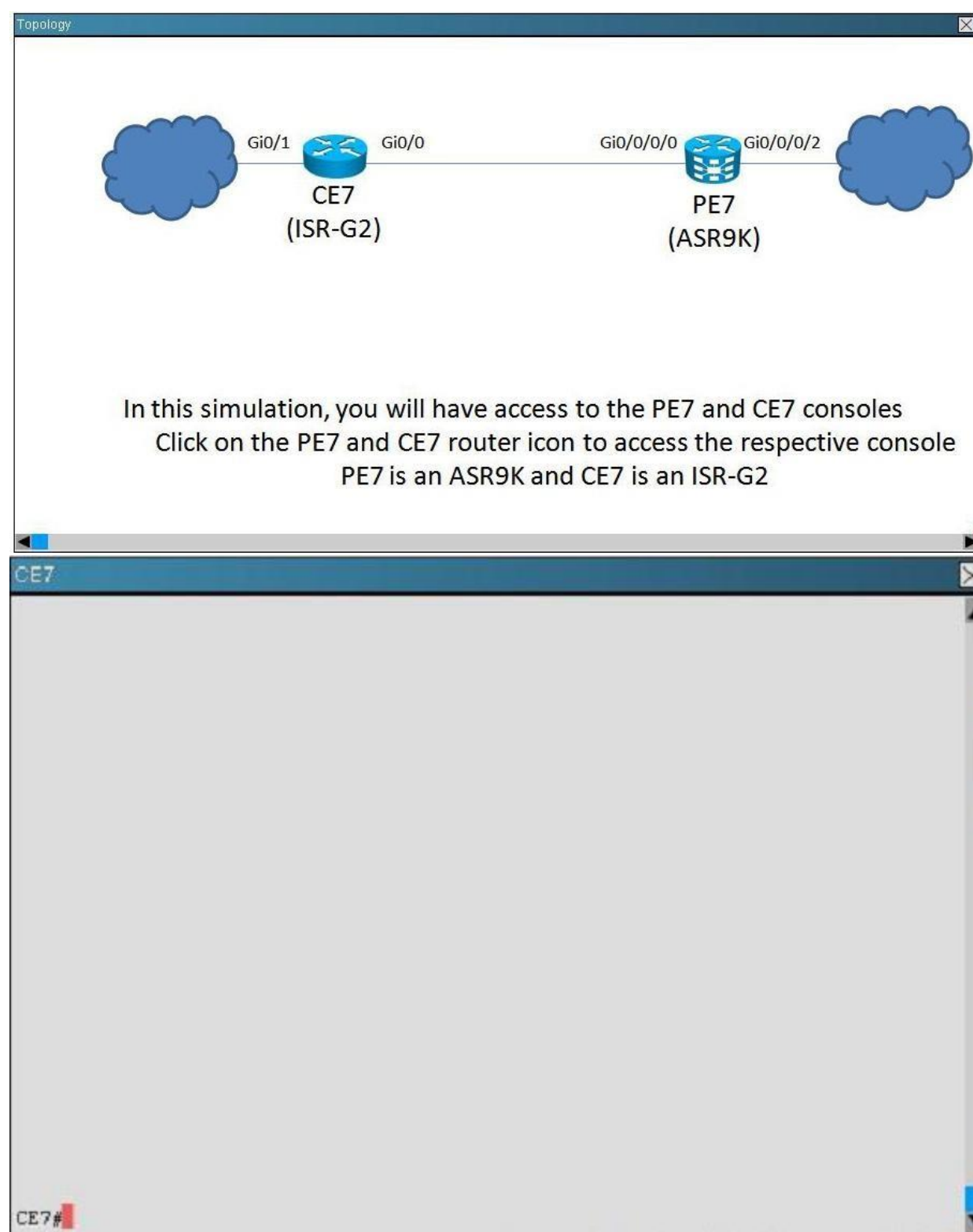
There are four multiple-choice questions with this task. Be sure to answer all four questions before selecting the Next button.

Not all the CLI commands or commands options are supported or required for this simulation.

All the devices in this simulation have been pre-configured and you are not required to enter in any configurations.

Scenario:

Referring to the network topology diagram shown in the exhibit, use the proper CLI commands on the CE7 and PE7 routers and interpret the supported CLI commands outputs to answer the four multiple choice questions.





On PE7 which statement is correct regarding the "traffic-policing" policy-map?

- A. The "traffic-policing" QoS policy is applied to the Gi0/0/0/0 interface in the outbound direction.
- B. The "traffic-policing" QoS policy will police the traffic matched by the "test12" ACL to 3 mbps and will drop all exceeding traffic.
- C. All incoming traffic not matched by the "test12" ACL to the Gi0/0/0/0 interface will be dropped.
- D. The "traffic-policing" QoS policy is using dual rate class-based traffic policing.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

#show running-config policy-map

#show policy-map

**QUESTION 79** According to the Intserv model, which two options are traffic-specific parameters? (Choose two.)

- A. token bucket
- B. calculated average queue size
- C. minimum policed unit
- D. traffic marking
- E. rate policing

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 80**

Which three options can an engineer select for a traffic policer in case the traffic rate is less than the conform burst? (Choose three.)

- A. Drop the packet.
- B. Transmit the packet.
- C. Set the CoS value and drop the packet.
- D. Set the DSCP value and drop the packet.
- E. Keep the packet in the buffer.
- F. Set the QoS group and drop the packet.

**Correct Answer:** ABF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 81

A network operations center analyzes a Wireshark capture and tries to verify which QoS policy is effective over a customer router. How many bits define the DSCP values?

- A. 3
- B. 6
- C. 8
- D. 16

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 82** Which option is a Cisco-recommended congestion management or queuing method for real-time traffic for voice and video?

- A. CB-WFQ
- B. PQ
- C. WFQ
- D. LLQ

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 83** An engineer wants to extend the trust boundary to a Cisco IP Phone. Which protocol should be used?

- A. CDP
- B. CoS
- C. ToS
- D. 802.1Q

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 84** Which three options are class maps able to match?  
(Choose three.)

- A. match access-group
- B. match protocol http url "\*cisco"
- C. match destination-port
- D. match DSCP
- E. match all
- F. match mac-address

**Correct Answer:** ABD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 85**

Which option is the appropriate way to configure a color-aware, dual-rate policer together with a color-blind, single-rate policer for the rest of the traffic? A.

```
class-map match-all CLASS1
match dscp af31
class-map match-all CLASS2
match dscp af32
class-map match-all CLASS3
match dscp ef
policy-map POLICY1
class CLASS1
police rate 100000 peak-rate 200000
conform-color CLASS2 exceed-color CLASS3
conform-action set-dscp-transmit af11
exceed-action set-dscp-transmit af21
violate-action set-dscp-transmit af23
```

```
class-map match-all CLASS 1
match dscp af31
class-map match-all CLASS2
match dscp af32
class-map match-all CLASS3
match dscp af33
policy-map POLICY1
class CLASS1
police rate 100000 burst 31250
conform-color CLASS2 exceed-color CLASS3
conform-action set-dscp-transmit af11
exceed-action set-dscp-transmit af21
violate-action set-dscp-transmit af23
```

B.



```
class-map match-all CLASS 1
match dscp af31 af32 af33
class-map match-all CLASS2
match dscp af32
class-map match-all CLASS3
match dscp af33
policy-map POLICY1
class CLASS1
police rate 100000 burst 31250
conform-color CLASS2 exceed-color CLASS3
conform-action set-dscp-transmit af31
exceed-action set-dscp-transmit af32
violate-action set-dscp-transmit af33
class class-default
police rate percent 10 peak-rate percent 30

class-map match-all CLASS 1
match dscp af31 af32 af33
class-map match-all CLASS2
match dscp af32
class-map match-all CLASS3
match dscp af33
policy-map POLICY1
class CLASS1
police rate 100000 peak-rate 200000
conform-color CLASS2 exceed-color CLASS3
conform-action set-dscp-transmit af31
exceed-action set-dscp-transmit af32
violate-action set-dscp-transmit af33
class class-default
police rate percent 10 peak-rate percent 30

class-map match-all CLASS 1
match dscp af31 af32 af33
class-map match-all CLASS2
match dscp af32
class-map match-all CLASS3
match dscp af33
policy-map POLICY1
class CLASS1
police rate 100000 peak-rate 200000
conform-color CLASS2 exceed-color CLASS3
conform-action set-dscp-transmit af31
exceed-action set-dscp-transmit af32
violate-action set-dscp-transmit af33
class class-default
police rate 10000
```

C.

D.

E.



**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 86** Which two traffic types are recognized by NBAR default configuration settings? (Choose two.)

- A. HTTP URL
- B. Sun RPC
- C. TCP
- D. UDP
- E. HTTPS URL

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 87** Which statement describes the QoS behavior between P and PE routers of an MPLS provider network for an L3VPN service?

- A. The PE function honors DSCP markings set by the CE.
- B. The customer and provider must agree on DSCP classification and traffic priorities.
- C. Classification of customer traffic is handled by the P router.
- D. The PE function cannot map DSCP markings to MPLS EXP bits.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 88** Which method is used to mark traffic matched by class-map MY\_CLASS as Expedited Forwarding?

- A. set ip dscp cs7
- B. set dscp cs7
- C. set dscp 46
- D. set dscp 45

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 89**

Which method maps MPLS EXP bit 5 to COS 5 on Cisco IOS XE?



```
configure terminal
```

```
class-map match exp
match mpls experimental topmost 5
exit
policy-map EXP2Cos
class exp
set cos 5
exit
class class-default
random-detec
```

```
interface fastethernet 0/0
service-policy output EXP2Cos
configure terminal
```

```
class-map match exp
match mpls experimental topmost 5
exit
policy-map EXP2Cos
class exp
set cos 5
exit
class class-default
random-detec
```

```
interface fastethernet 0/0
service-policy input EXP2Cos
configure terminal
```

```
class-map match exp
match mpls cos 5
exit
policy-map EXP2Cos
class exp
set mpls experimental topmost 5
exit
class class-default
random-detec
```

```
interface fastethernet 0/0
service-policy output EXP2Cos
exit
commit
```



A.

B. C.

```
configure terminal
```

```
class-map match exp
```

```
match mpls cos 5
```

```
exit
```

```
policy-map EXP2Cos
```

```
class exp
```

```
set mpls experimental topmost 5
```

```
exit
```

```
class class-default
```

```
random-detect
```

```
interface fastethernet 0/0
```

```
service-policy output EXP2Cos
```

```
exit
```

```
commit
```

```
configure terminal
```

```
ip access-list 101 permit ip any any mpls experimental 5
```

```
class-map match exp
```

```
match access-group 101
```

```
exit
```

```
policy-map EXP2Cos
```

```
class exp
```

```
set cos 5
```

```
exit
```

```
class class-default
```

```
random-detect
```

```
interface fastethernet 0/0
```

```
service-policy output EXP2Cos
```

```
exit
```

D.



E.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 90**

The Cisco IOS and IOS XE qos pre-classify command allows which kind of packet classification on IP packets that are encapsulated with GRE and IPsec?

- A. allows for packets to be classified based on the ToS byte values before packet encryption
- B. allows for packets to be classified based on the ToS byte values after packet encryption
- C. allows for packets to be classified based on the packet payload before packet encryption
- D. allows for packets to be classified based on the packet payload after packet encryption
- E. allows for packets to be classified based on the packet header parameters other than the ToS byte values after packet encryption

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 91** An engineer has been tasked to configure a guaranteed 2 Mbps of bandwidth for outgoing FTP traffic on interface FastEthernet 1/1/1 on Cisco IOS XR. Which method accomplishes this configuration? A.

```
configure terminal
class-map FTP_CLASS
match protocol ftp
exit
policy-map POLICY_1
class FTP_CLASS
bandwidth 2000
exit
exit
interface FastEthernet 1/1/1
service-policy output POLICY_1
end
commit

configure terminal
class-map FTP_CLASS
match protocol ftp
exit
policy-map POLICY_1
class FTP_CLASS
bandwidth 2000000
exit
exit
interface FastEthernet 1/1/1
service-policy input POLICY_1
end
commit

configure terminal
access-list 100 permit ip any any eq 21
policy-map POLICY_1
match ip access-list 100
bandwidth 2000
exit
exit
interface FastEthernet 1/1/1
service-policy output POLICY_1
end
commit
```

B.



- C.
- ```
configure terminal
policy-map POLICY_1
class FTP_CLASS
match protocol ftp
bandwidth 2000000
exit
exit
interface FastEthernet 1/1/1
service-policy input POLICY_1
end
```
- D. commit

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 92** An engineer has been tasked to configure a guaranteed 10 Mbps priority queue for traffic matched by class-map VOICE\_CLASS on Cisco IOS XR. Which policy must be applied for outgoing traffic on interface FastEthernet 0/0/1? A.

- ```
configure
policy-map VOICE_POLICY
class VOICE_CLASS
police rate 10000
exceed-action drop
exit
priority level 1
exit
exit
interface FastEthernet 0/0/1
service-policy output VOICE_POLICY
commit
```
- configure  
policy-map VOICE\_POLICY  
class VOICE\_CLASS  
priority percent 10  
exit  
exit  
interface FastEthernet 0/0/1  
service-policy output VOICE\_POLICY  
commit
- B.



```
configure
policy-map VOICE_POLICY
class VOICE_CLASS
police rate 1000
exceed-action drop
exit
priority level 1
exit
exit
interface FastEthernet 0/0/1
service-policy output VOICE_POLICY
commit
configure
policy-map VOICE_POLICY
class VOICE_CLASS
police rate 10 Mbps
exceed-action shape
exit
priority level 1
exit
exit
interface FastEthernet 0/0/1
service-policy output VOICE_POLICY
commit
```

C.



D.

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 93**

When implementing CBWFQ, where should Weighted Random Early Detection configuration be applied?

- A. route-map
- B. policy-map
- C. class-map
- D. service-policy

**Correct Answer: B**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 94** Which QoS technique can be used to protect customer traffic from being dropped by traffic rate limiting performed by the service provider?

- A. LLQ
- B. policing
- C. fair-queue
- D. shaping

**Correct Answer: D**

**Section: (none)**

**Explanation**

**Explanation/Reference:**



**QUESTION 95**

```
0000 0011 1110 1000 0001 .....  
..... 000 .....  
..... 1 .....  
..... 1111 1111
```

Refer to the exhibit. Based on the raw format of an MPLS header captured by a traffic analyzer, what is the value of the MPLS EXP field?

- A. 1
- B. 255
- C. 5
- D. 29

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 96**

Which two characteristics describe the difference between MPLS QoS pipe and short-pipe models? (Choose two)

- A. Short-pipe mode does not need MPLS usage, but pipe mode does.
- B. In short-pipe mode, the egress LSR uses the tunneled PHB marking, but in pipe mode, the egress LSR uses the LSP PHB marking.
- C. Pipe mode does guarantee that the tunneled packet marking remains unchanged, but short-pipe does not.
- D. In short-pipe mode, the egress LSR uses the LSP PHB marking, but in pipe mode, the egress LSR uses the tunneled PHB marking.
- E. Short-pipe mode can be implemented on MPLS networks regardless of the MPLS PHP mechanism usage.

**Correct Answer:** BE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 97

An engineer must automatically copy the IP Prec/DiffServ PHB marking to the EXP bits of the imposed MPLS label on the ingress PE, as well as the MPLS EXP bits to the IP Prec/DiffServ of the egress PE. Which MPLS QoS model is suitable for this requirement?

- A. pipe model
- B. short-pipe model
- C. uniform model
- D. uniform pipe model

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 98

A service provider recently defined new SLA services that provide QoS transparency over MPLS DiffServ-TE services. Which two tunneling modes provide QoS transparency? (Choose two.)

- A. short pipe mode
- B. uniform mode
- C. pipe mode with an explicit NULL LSP
- D. pipe mode without a explicit NULL LSP
- E. best effort mode

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 99

Refer to the exhibit. Which configuration error prevents this traffic-shaping policy from working?

```
policy-map WAN
class class_A
shape average 512000 32000
!
interface serial 4/0
service-policy input WAN
```

- A. The WAN interface is starting to drop packets because no queuing mechanism is implemented.
- B. Traffic-shaping policies are applied only in the outbound direction.
- C. The class\_A configuration shape peak is used to maximize the serial interface performances.
- D. The service-policy command is applied only on logical or channeled interfaces.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 100**

Refer to the exhibit. From which table was the information obtained?

PE2#show mpls forwarding-table 5.5.5.5					
Local Label	Outgoing Label	Prefix or Tunnel Id	Bytes Label Switched	Outgoing interface	Next Hop
20	20	5.5.5.5/32	0	Et0/1	10.10.23.3
	21	5.5.5.5/32	0	Et0/2	10.10.24.4
	19	5.5.5.5/32	0	Et0/3	10.10.26.6

- A. FIB
- B. CEF
- C. LIB
- D. LFIB

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 101** How many labels does an MPLS packet have, with a bottom-of-stack label set to zero?

- A. The packet has no label.
- B. The packet has one label.
- C. The packet may have one or more labels.
- D. The packet has at least two labels.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 102** Which four options are methods by which labels can be assigned in the label stack to an IP prefix? (Choose four.)

- A. LDP
- B. CEF
- C. BGP
- D. RSVP
- E. static

- F. IGP
- G. route recursion
- H. manual tagging

**Correct Answer:** ACDG

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 103** An LDP session is established between two neighbors. Over which protocol and port number do they maintain their adjacency?

- A. TCP 711
- B. UDP 646C. UDP 711
- D. TCP 646

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 104**

Which option describes what happens when a labelled packet with a TTL of 1 is received by an LSR?

- A. The packet is forwarded on to the next router where its TTL expires and from where an ICMP "time exceeded" message is generated and routed back to the source.
- B. The packet is dropped and an ICMP "time exceeded" message is IP routed back to the sender.
- C. The packet is dropped and an ICMP "time exceeded" message is label-switched from the expiring router back on a new path toward the source.
- D. The packet is dropped and an ICMP "time exceeded" message is label-switched from the expiring router on the same label switched path toward the destination and then back to the originating source.
- E. The packet is forwarded on to the next router where its TTL expires and from where an ICMP "time exceeded" message is generated and label switched back to the source.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 105** Which protocol is used to send MPLS OAM traffic over an MPLS network?

- A. ICMP
- B. IP protocol number 137
- C. TCP
- D. UDP

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 106** Which four options describe the functions of the control world in an AToM environment? (Choose four.)



- A. It carries generic and Layer 2 payload-specific information.
- B. It prevents fragmentation and reassembly.
- C. It preserves the sequence of the transported frames.
- D. It is responsible for padding all packets.
- E. It is responsible for padding the small packets.
- F. It enables proper load balancing without packet desequencing independent of L2VPN packet content.
- G. It enables an optimal path for the L2VPN packet content to follow through the MPLS backbone.
- H. It carries Layer 2 payload-specific information.

**Correct Answer:** ACEF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 107

```
RP/0/RSP1/CPU0:ASR9006#sh mpls ldp igp sync
Bundle-Ether9000:
  Sync status: Ready
  Peers:
    192.168.1.25:0 (GR)
GigabitEthernet0/1/0/10:
  Sync status: Not ready
```

Referring to the Cisco IOS XR show command output exhibit, what are three possible reasons that the GigabitEthernet0/1/0/10 LDP IGP sync status is not ready? (Choose three.)

- A. GigabitEthernet0/1/0/10 is not configured to run LDP.
- B. Graceful restart is not configured on the peer.
- C. The LDP neighbor on GigabitEthernet0/1/0/10 is not up.
- D. The OSPF neighbor on GigabitEthernet0/1/0/10 is not up.
- E. LDP is up on GigabitEthernet0/1/0/10, but no label bindings have been received from the peer.
- F. GigabitEthernet0/1/0/10 is a member link of Bundle-Ether9000.

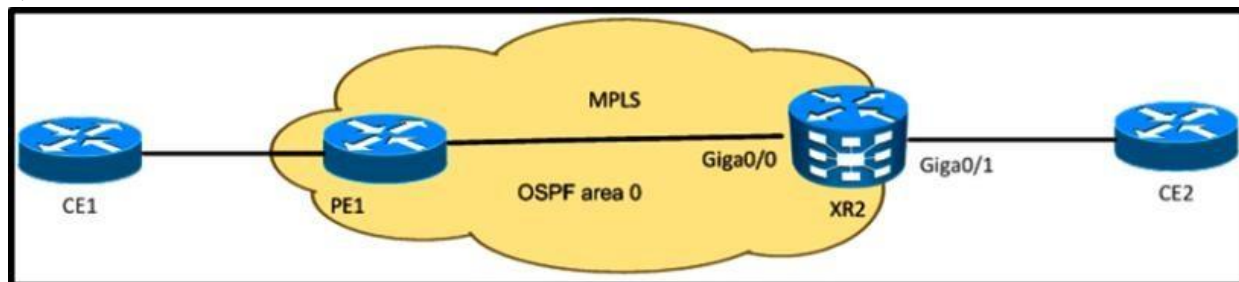
**Correct Answer:** CDE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 108



Refer to the exhibit. XR2 needs to have LDP configured with PE1. Which configuration achieves this goal? A.

```
interface giga 0/0
mpls ip
exit
commit
router ospf 1
mpls ldp auto config area 0
exit
commit
router ospf 1
area 0 mpls ldp auto config
exit
commit
interface giga 0/1
mpls ldp
exit
commit
```

B.

C.

D.



**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 109

Which three fields must be the same in an IPv6 header to consider different packets on the same flow? (Choose three.)

- A. source port
- B. destination address
- C. destination port
- D. source address
- E. flow label
- F. transport protocol type

**Correct Answer:** BDE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 110**

An engineer is working in a service provider environment to troubleshoot a MPLS VPN. The engineer determines that LDP neighborship is flapping between two routers and causing disruption to the traffic. Which LDP feature can help to solve the issue?

- A. LDP Discovery
- B. LDP auto-configuration
- C. LDP graceful-restart
- D. LDP NSF

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 111**

Which configuration can a network engineer use to establish high availability for LDP in an MPLS setup? A.

```
mpls ldp
 graceful-restart
 graceful-restart
 graceful-restart forwarding state-holdtime 180
 graceful-restart reconnect-timeout 15
 interface HundredGigE0/4/0/0
```

```
mpls ldp
 graceful-restart
 graceful-restart forwarding state-holdtime 180
 graceful-restart reconnect-timeout 15
```

```
mpls ldp
 session protection for peer_acl duration 60
 ipv4 access-list peer_acl
 10 permit ip host 192.168.10.1 any
```

```
router ospf 1
 mpls ldp sync
 mpls ldp
 igp sync delay 30
```

B.

C.

D.

```
mpls ldp
 router-id loopback0
 discovery hello holdtime 15
 discovery hello interval 5
```

E.



Correct Answer: A

Section: (none)

Explanation

Explanation/Reference:

**QUESTION 112** Which configuration fulfills the requirement of configuring LDP with Cisco Nonstop Forwarding on a router with 5 minutes time to hold the forwarding table information and 1 minute retry timer value for an LDP connection? A.

```
mpls ldp
 graceful-restart
 graceful-restart forwarding state-holdtime 5
 graceful-restart reconnect-timeout 1
 interface GigabitEthernet0/0/0/0
 !

mpls ldp
 graceful-restart
 graceful-restart forwarding state-holdtime 300
 graceful-restart reconnect-timeout 60
 interface GigabitEthernet0/0/0/0
 !

mpls ldp
 nsr
 graceful-restart
 graceful-restart forwarding state-holdtime 300
 graceful-restart reconnect-timeout 60
 interface GigabitEthernet0/0/0/0
 !

mpls ldp
 nsr
 graceful-restart
 graceful-restart forwarding state-holdtime 5
 graceful-restart reconnect-timeout 1
 interface GigabitEthernet0/0/0/0
 !
```

B.

C.

D.



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 113**

Which three commands are used to troubleshoot why IP packets are not forwarded on the LSP? (Choose three.)

- A. show cef prefix/length to check the prefix information
- B. debug mpls ldp transport events to display events related to the LDP peer discovery mechanism
- C. show mpls forwarding labels <label-id> hardware egress location <node-id> to check the hardware label FIB
- D. show arp <prefix> location <node-id> for the next hop prefix
- E. show mpls ldp discovery for the corresponding label information
- F. debug mpls ea platform all to display MPLS setup events and errors

**Correct Answer:** ACD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 114**

A network engineer must design a core network routing domain that supports Cisco MPLS TE. Which two interior gateway protocols represent viable solutions? (Choose two.)

- A. Routing Information Protocol version 2
- B. Open Shortest Path First
- C. Enhanced Interior Gateway Routing Protocol
- D. Intermediate-System to Intermediate-System
- E. Border Gateway Protocol



**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 115**

The network architecture team is proposing to enable Cisco MPLS TE over the entire service provider core network. Which two options are benefits of Cisco MPLS TE that affect their decision? (Choose two.)

- A. Cisco MPLS TE optimizes network resources.
- B. Cisco MPLS TE data flows independent from the underlying IGP.
- C. Cisco MPLS TE increases the data forwarding rate.
- D. Cisco MPLS TE tunneling does not require maintenance.
- E. Cisco MPLS TE offers network resource reservation, which removes any need for QoS MQC policies.

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 116** Which two fields are in the traffic engineering topology database? (Choose two.)

- A. TE-metric
- B. IGP metric
- C. link delay
- D. LSP setup priority
- E. LDP authentication

**Correct Answer:** AD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 117

A network engineer must analyze RSVP-TE signaling on a syslog server. Which three RSVP messages are valid? (Choose three.)

- A. RSVP PATH
- B. RSVP RESERVATION
- C. RSVP ESTABLISHED
- D. RSVP PATH TEAR
- E. RSVP KILL
- F. RSVP INIT

**Correct Answer:** ABD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 118

An engineer is tasked to deploy Fast Reroute for Cisco MPLS TE. Which LSR is in charge to request the Fast Reroute capability along the LSP?

- A. point of local repair
- B. tail end router
- C. ingress and egress PE routers
- D. head-end router
- E. BGP routers acting as route reflectors

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 119

The regional operation center deploys a Cisco MPLS TE tunnel over the company's core network. The Cisco MPLS TE tunnel is up and no error is detected, but no traffic is traversing the tunnel. Which two issues are possible causes? (Choose two.)

- A. The provider edge router is not performing the correct redistribution.
- B. The interior gateway protocol has no knowledge of the Cisco MPLS TE tunnel.
- C. No static route has been defined to route data traffic over the Cisco MPLS TE tunnel.
- D. The customer edge router is injecting rogue IPv4 prefixes in the provider edge routing table.
- E. The end-to-end label switched path has not been established.

**Correct Answer:** BC

Section: (none)

Explanation

Explanation/Reference:

#### QUESTION 120

Cisco MPLS TE tunnels recently have been deployed to minimize the utilization of a congested link in the core network. The tunnels are up and the administrative weight is correctly configured, but no improvement has occurred since they went into production. Which IOS command can be used to modify Cisco MPLS TE path selection on an interface?

- A. mpls traffic-eng administrative-weight 100
- B. ls-ls metric 100
- C. ip rsvp bandwidth percent 90
- D. tunnel mpls traffic-eng path-selection metric te

Correct Answer: A

Section: (none)

Explanation

Explanation/Reference:

#### QUESTION 121

Given this configuration of an interface for MPLS traffic engineering on a Cisco IOS XE router:

```
interface POS1/1/0 mpls traffic-eng tunnels ip rsvp bandwidth 5000
```

Which option lists the equivalent configurations required on a Cisco IOS XR router? A.

```
interface POS1/1/0
mpls traffic-eng tunnels
ip rsvp bandwidth 5000
```

```
mpls traffic-eng
interface POS1/1/0
```

```
mpls traffic-eng
interface POS1/1/1
bandwidth 5mb
```

```
mpls traffic-eng
interface POS1/1/0
rsvp
interface POS1/1/0
```

```
mpls traffic-eng
interface POS1/1/0
rsvp
interface POS1/1/0
bandwidth 5000
```

B.

C.

D.





E.

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 122**

A company asks an engineer to provide an explanation for implementing MPLS DiffServ-TE services. Which option is a DiffServ-TE fundamental concept that should be highlighted?

- A. expedited forwarding
- B. assured forwarding
- C. class of service
- D. class types
- E. fast reroute

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 123** A network engineer must make a reservable maximum bandwidth of 75 Mbps on a Cisco ASR 9000 series router. Which configuration satisfies this requirement in Cisco IOS XR? A.

```
mpls traffic-eng
  interface GigabitEthernet 0/1/0/1
    bandwidth 75 Mbps
```

```
mpls traffic-eng
  interface GigabitEthernet g0/1/0/1
    bandwidth 750000
```

```
rsvp
  interface GigabitEthernet g0/1/0/1
    bandwidth 75 Mbps
```

```
rsvp
  interface GigabitEthernet g0/1/0/1
    bandwidth 75000000 bps
```

B.

C.

D.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 124** A network operations center requests support to configure a Cisco MPLS TE tunnel on a Cisco IOS XR router. Which command sets a specific bandwidth required to the corresponding Cisco MPLS TE tunnel? A.

```

rsvp
interface interface-path-id
bandwidth bandwidth

interface tunnel-te tunnel_id
!
bandwidth bandwidth

interface tunnel-te tunnel_id
!
signaled-bandwidth bandwidth

mpls traffic-eng
auto-bw collect frequency value
!
```

B.

C.

D.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 125**

An engineer is allocating a determined amount of bandwidth to a customer Cisco MPLS TE tunnel to guarantee its availability on a 24/7 SLA type. Which option must be configured to make sure the customer is able to use the bandwidth agreed on the SLA?

- A. RSVP that guarantees bandwidth availability end-to-end
- B. Cisco MPLS TE tunnel to signal the bandwidth required
- C. a QoS policy to reinforce the RSVP bandwidth reservation
- D. overprovisioning to guarantee bandwidth

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 126

Which two considerations are important when implementing a Cisco MPLS TE NHOP or NNHOP protection? (Choose two.)

- A. The head-end router requires configuring high priority for the Cisco MPLS TE tunnel.
- B. The head-end router requires configuration for the NHOP or NNHOP protection request to occur.
- C. The reconvergence time must be no longer than 10 seconds.
- D. The Cisco MPLS TE tunnel on the Point of Local Repair implementing protection requires configuration as backup interface.
- E. The tail-end router must be aware of the request for NHOP or NNHOP protection.

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 127

An engineer is setting up a routing instance to route the traffic across the back-up tunnel on a deployed Cisco MPLS TE next-hop protection. Which option describes the result?

- A. a static route that points to the link
- B. BGP routes that points to the link
- C. an OSPF or IS-IS instance that explicitly advertises the back-up tunnel
- D. rerouted traffic by the back-up tunnel in the event of link failure

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 128** Which two network devices are trusted endpoints in a network? (Choose two.)

- A. video endpoint
- B. PC
- C. wireless clients
- D. IP phone

**Correct Answer:** AD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 129** In an IPv6 header, what does a flow label of zero indicate?

- A. The packet is not part of any flow.
- B. The size of the flow label is zero bytes.
- C. The label flow cannot have a value of zero.
- D. The packet belongs to the flow labeled zero.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 130**

Which option is the appropriate method for CBWFQ WRED implementation in Cisco IOS XR? A.

```
configure
policy-map POLICY_1
class CLASS1
random-detect default
commit

configure
policy-map POLICY_1
class CLASS1
wred default
commit

configure
interface pos 0/0/0/0
random-detect default
commit

configure
policy-map POLICY_1
class CLASS1
weighted random-detect default
commit
```

B.

C.

D.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 131

What is a primary difference between QoS operations on IOS and IOS XR?

- A. IOS XR features multi-level LLQ
- B. IOS XR automatically polices the LLQ
- C. IOS XR does not support NBAR
- D. IOS XR cannot set FR-DE

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 132

An engineer must configure a policy on a Cisco IOS XE router that achieves the following:

- Traffic 2 Mbps or less is transmitted
- Traffic between 2 Mbps and 3 Mbps is marked with IP Precedence 4
- Traffic that exceeds 3 Mbps is dropped

Which configuration achieves this policy? A.

```
configure terminal
policy-map POLICE
class class-default
  police 2000000
    conform-action transmit
    exceed-action 3000000 set-prec-transmit 4
    violate-action drop
exit
exit
exit
interface FastEthernet 0/0/0
  service-policy input POLICE

configure terminal
policy-map POLICE
class class-default
  police rate 2000000 pir 3000000
    conform-action transmit
    exceed-action set-prec-transmit 4
    violate-action drop
exit
exit
exit
interface FastEthernet 0/0/0
  service-policy input POLICE
```

B.



```
configure terminal
policy-map POLICE
class class-default
  police cir 2000000 pir 3000000
  conform-action transmit
  exceed-action set-prec-transmit 4
  violate-action drop
exit
exit
interface FastEthernet 0/0/0
service-policy input POLICE
```

```
configure terminal
policy-map POLICE
class class-default
  police cir 2000000 pir 3000000
  conform-action transmit
  exceed-action set-dscp AF4
  violate-action drop
exit
exit
interface FastEthernet 0/0/0
service-policy input POLICE
```

C.



D.

**Correct Answer: C**

Section: (none)

Explanation

Explanation/Reference:

**QUESTION 133** Which statement defines how MPLS LDT Graceful Restart works after a service interruption?

- A. It works independent of neighboring routers to recover MPLS forwarding information
- B. It works by helping all neighboring MPLS LDP routers to recover MPLS forwarding information
- C. It works by helping neighboring routers with MPLS LDP SSO/NSF and Graceful Restart to recover MPLS forwarding information
- D. It works independent of neighboring non-LDP Graceful Restart routers to recover MPLS forwarding information

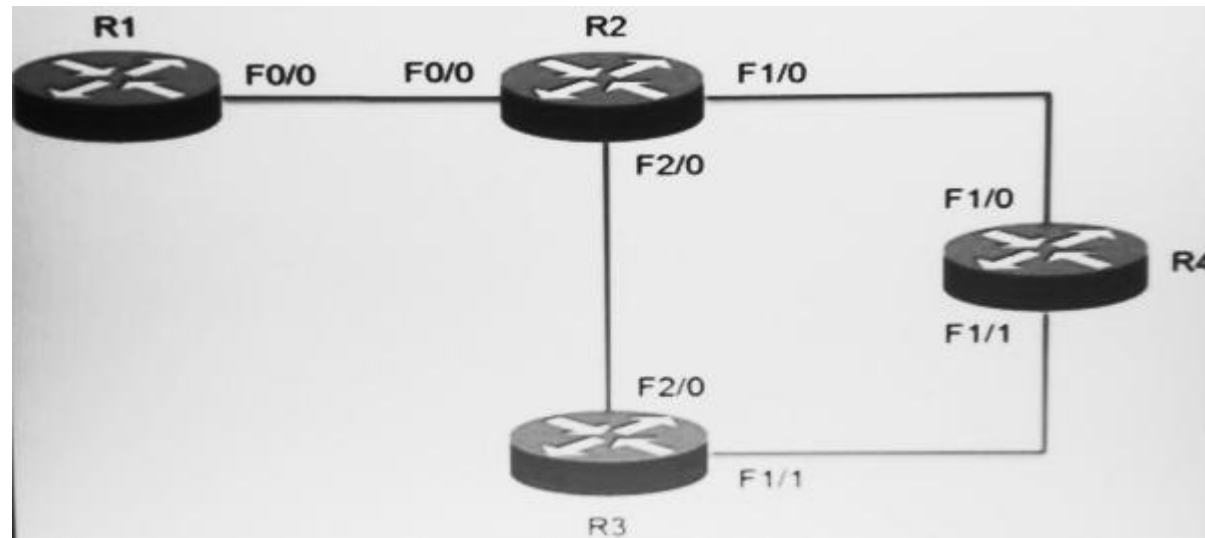
Correct Answer: C

Section: (none)

Explanation

Explanation/Reference:

**QUESTION 134**



Refer to the exhibit. MPLS TE Tunnel 138 has a headend R1 and a tailend R4, and uses path R1-R2-R4 as the primary LSP. The path R1-R2-R3-R4 should be implemented as a backup LSP in case the R2-R4 link fails. To which interface should the appropriate configuration be applied to accomplish this? A.

```

R3
int Fa2/0
mpls traffic-eng backup-path tunnel 100

R2
int Fa0/0
mpls traffic-eng backup-path tunnel 100

R2
int Fa1/0
mpls traffic-eng backup-path tunnel 100

R3
int Fa1/1
mpls traffic-eng backup-path tunnel 100
  
```



B.

C.

D.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 135** Which two advantages are reasons that service providers might deploy MPLS? (Choose two.)

- A. to avoid using IGP in the core
- B. to facilitate smooth migrations between legacy WAN technologies
- C. to reduce the throughput overhead of full IPv4/IPv6 headers when traversing the core
- D. to reduce the computational requirements that are placed on router CPUs
- E. to reduce configuration and feature requirements in the core

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 136** A customer MPLS domain recently required an excessive time to reconverge. In response, a high availability solution will be deployed. Which command set should be issued to improve LDP high availability on IOS XE instances? A.

```
mpls ldp
interface type slot/subslot/port
commit
!
graceful-restart
end
!
ip cef distributed
!
mpls label protocol tdp
mpls ldp logging neighbor-changes
mpls ldp graceful-restart
!
interface type slot/subslot/port
mpls ip
!
redundancy
mode sso
!
ip cef distributed
mpls label protocol ldp
mpls ldp logging neighbor-changes
mpls ldp graceful-restart
!
ip cef
!mpls ldp
logging neighbor-changes
graceful-restart
!
```

B.

C.

D.



**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 137** Which two factors must you consider when configuring MPLS EXP? (Choose two.)

- A. MPLS EXP marking is supported in the egress direction
- B. A packet that IP ToS classifies at ingress can be reclassified by MPLS EXP at egress
- C. MPLS EXP marking is supported in the ingress direction
- D. MPLS EXP classification for bridged MPLS packets on EVCs is supported
- E. A packet that MPLS classifies at ingress can be reclassified by IP ToS at egress

**Correct Answer:** CE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 138**

```
interface Tunnel1001
 tunnel mode mpls traffic-eng
 ip address unnumbered
 tunnel destination 10.0.0.1
 tunnel mpls traffic-eng path-option 1 dynamic
```



Refer to the exhibit. Which two commands can be used to assign traffic onto MPLS TE Tunnel1001? (Choose two.)

- A. ip route 0.0.0.0 0.0.0.0 Tunnel1001
- B. tunnel mpls traffic-eng autoroute announce
- C. tunnel mpls traffic-eng bandwidth
- D. tunnel mpls traffic-eng priority 1 1
- E. ip route 0.0.0.0 0.0.0.0 10.0.0.1

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 139** Which two options are able to perform the MPLS label distribution function? (Choose two.)

- A. manual tagging
- B. static
- C. LDP
- D. RSVP-TE
- E. CEF

**Correct Answer:** CD

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 140** A company is experiencing congestion on Internet T1 links that transport site-to-site IPsec tunnels between head offices. QoS configuration is being modified on these T1 links. Which option describes the result from this QoS configuration?

- A. VPN traffic is unaffected because the inner ToS field is encrypted and hidden from the policy
- B. The physical interface is affected by the new QoS configuration
- C. The internal VPN logical interface reflects the new QoS service policy
- D. IPsec protocol applications work independently of the QoS configuration

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 141**

A service provider experiences routing issues in a customer MPLS network. The customer has two sites that are connected over its core. Which feature can be used for troubleshooting?

- A. disabling of Cisco Express Forwarding, to enable the use of LSP Ping and LSP Traceroute to verify the IP routing path
- B. redistribution between the BGP IPv4 and VPNv4 address families, to use labels to forward the customer packets
- C. LSP Ping, to confirm that the label-switched path is used for transport
- D. traceroute, to verify the label-switched path that is used for point-to-multipoint

**Correct Answer: C**

**Section: (none)**

**Explanation**



**Explanation/Reference:**

**QUESTION 142**

A network architect recently deployed AToM solutions for large enterprises over a service provider core network. The architect now asks to deploy QoS over the same VPN to reinforce the SLA for these customers. Which MPLS label field can be used for this purpose?

- A. discard/eligibility field
- B. type of service
- C. last 8 bits
- D. experimental bits

**Correct Answer: D**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 143** Which option describes the IPv6 flow label field?

- A. a 3-bit field used for marking a traffic flow
- B. an 8-bit field used for labeling a traffic flow
- C. a 20-bit field used to tag a traffic flow throughout the network
- D. an 8-bit field out of which the first 6 are used to classify packets

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 144** An engineer looks at packet captures and sees that the MPLS header field of a packet indicates a bottom of stack field of 0. What can the engineer conclude from this information?

- A. The packet is an AToM packet
- B. One label is on the packet
- C. At least one more MPLS label is on the packet
- D. No labels are on the packet

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 145**

An engineer is having a problem getting an operational 10 Gigabit link on a Cisco ASR 9000 series router. The service provider instructs the engineer to use an LR optic. The engineer must access the router remotely. Which command should the engineer issue to determine that the correct optic has been installed?

- A. show controllers
- B. show module optics
- C. show ip interface
- D. show optics

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 146** Which option shows how a class map is implemented that matches only packets originating from the network 10.0.0.0/8, which are not marked as VoIP on

```
ip access-list standard 10 permit 10.0.0.0 0.0.0.255
class-map match-all
match access-group 10
match not ip dscp ef

ip access-list standard 10 permit 10.0.0.0 255.255.255.0
class-map match-any
match access-group 10
match not ip dscp ef

ip access-list standard 10 permit 10.0.0.0 0.0.0.255
class-map match-all
match access-group 10
match not qos-group 1

ip access-list standard 10 permit 10.0.0.0 0.255.255.255
class-map match-all
match access-group 10
match not ip dscp ef
```

Cisco IOS XE? A.

B.

C.

D.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 147** Which queuing mechanism should an engineer implement on delay sensitive categories of traffic?

- A. weighted fair
- B. priority
- C. low-latency
- D. weighted round-robin

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 148**

A recent analysis of a service provider network infrastructure revealed the necessity to reinforce bandwidth control over all the 5 Mbps residential customer contracts. Which option is a viable solution to rate limit customer's bandwidth both upstream and downstream?

- A. class-based policing
- B. committed access rate on a per interface basis
- C. reserving 5 Mbps on Cisco MPLS TE tunnels that connect customers
- D. setting customer Ethernet links to 10 Mbps half-duplex

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 149** Which two interface types can support qos pre-classify (Choose two.)

- A. virtual templates
- B. tunnel interfaces

- C. FastEthernet
- D. FDDI

**Correct Answer:** BC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 150

An engineer is deploying CB-WRED across the entire core network to enforce the previously deployed CB-WFQ and decides to change the WRED default to make it work with DSCP. Which policy-map command enables this new profile on regular Cisco IOS routers?

- A. random-detect
- B. random-detect dscp value
- C. random-detect dscp based
- D. random-detect precedence value

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 151** An engineer sets up QoS over MPLS networks. How many classes of traffic can one LSP support?

- A. as many as 8, because the EXP field is 3 bits
- B. as many as 3, because the EXP field is 3 bits
- C. as many as 64, because the DSCP field is 6 bits
- D. as many as 6, because the DSCP field is 6 bits



**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 152** In Cisco IOS, what must be configured to ensure that an MPLS TE tunnel becomes active?

- A. layer 3 addressing on the tunnel, to establish bidirectional communication over the tunnel
- B. the tunnel for autoroute, to ensure proper installation into the forwarding plane
- C. a path-option configuration, for either dynamic or explicit paths
- D. the tunnel with a minimum bandwidth value, to properly calculate CSPF

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 153

DRAG DROP



You create an MPLS TE tunnel in IOS XR Software and want to configure forwarding on the tunnel. Drag the steps on the left to their correct order on the right.

Select and Place:

Configure messages that notify the neighbor nodes about the forwarded routes	Step 1
Enable a route using IPv4 addressing for forwarding	Step 2
Enter MPLS TE interface configuration mode	Step 3
Assign a source address to ne used for forwarding on the new tunnel	Step 4

Correct Answer:

	Enter MPLS TE interface configuration mode
	Assign a source address to ne used for forwarding on the new tunnel
	Configure messages that notify the neighbor nodes about the forwarded routes
	Enable a route using IPv4 addressing for forwarding

Section: (none)

Explanation

Explanation/Reference:

**QUESTION 154** Which feature should you configure to enable routers to maintain MPLS label information despite link flaps on an interface?

- A. Targeted Adjacency
- B. IGP Synchronization
- C. MPLS LDP Session Protection
- D. NSR

Correct Answer: C

Section: (none)

Explanation

Explanation/Reference:

**QUESTION 155** Which option is the correct definition of the LB on a Cisco router?

- A. a table used by switching functions to forward labeled packets
- B. a table that holds the next hop for destination prefixes
- C. a label-based adjacency table
- D. a table that stores remote and local label bindings

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 156** How is bandwidth recalculated when utilizing the automatic bandwidth adjustment feature for MPLS TE?

- A. The tunnel's output average is periodically sampled and then the bandwidth is adjusted to the largest sample obtained during the period, or to the configured maximum
- B. The tunnel's output is sampled and then the bandwidth is adjusted by a configured percentage until the configured maximum value is reached
- C. Ping is used to measure congestion and the bandwidth is adjusted by a configured percentage until the maximum value is reached
- D. Ping is used to measure congestion and the bandwidth is adjusted to either the minimum, average, or maximum configured bandwidth value

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 157**

At which layer does Cisco recommend the QoS trust boundary be set for an enterprise network environment?

- A. core layer, facing the distribution layer
- B. distribution layer, facing the access layer
- C. access layer, facing the end hosts
- D. distribution layer, facing the core layer

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 158**

Which message is sent through the desired LSP path by the headend router and is used to determine available resources?

- A. PATH
- B. TENT
- C. RSVP
- D. RESV

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 159**

Refer to the exhibit. IT administrators report packet loss on the critical applications coming with CoS 4. Which option is the appropriate configuration to have a lower drop probability when the packets are processed using DSCP values?

```
class-map match-any cos_4
  match cos 4
!
policy-map set_dscp
  class cos_4
    set ip dscp af42
    bandwidth 5000
random-detect dscp-based
!
```

- A. set ip dscp af22 B.  
set ip dscp af41  
C. set ip dscp af13 D.  
set ip dscp af32

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 160** Which driver uses an IntServ QoS model in an MPLS TE enabled service provider network?

- A. DSCP, which requires signaling across the provider network  
B. RSVP, which enables bandwidth guarantees across a provider network  
C. RSVP, which enables per-hop behavior across a provider network  
D. DSCP, which enables bandwidth guarantees across a provider network



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 161** Which option describes the function of an IPv6 flow label?

- A. serves as a management flow to easily monitor any TCP/IP session running over IPv6  
B. serves as a 20-bit checksum per flow for authentication services built into IPv6  
C. enables efficient IPv6 flow classification based only on IPv6 main header fields  
D. used by MPLS when the service provider core network is fully IPv6 enabled

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 162** An engineer deployed a Cisco MPLS TE next-hop protection over a switched environment. While testing the link protection, an excessive IGP delay in the reconvergence time is seen. Which action fixes this issue?

- A. Replace the existing link with a routed back-to back link  
B. Configure object tracking

- C. Set up more aggressive IGP timers
- D. Implements BFD on the link

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 163**

Which option shows how a network engineer implements QPPB marking of incoming traffic on a router that is connected to a VoIP SP (AS62000, BGP community 60000:1) and to a data services service provider (AS61000, BGP community 61000:1) on Cisco IOS XE?

```
ip bgp-community new-format
ip community-list 1 permit 60000:1
ip as-path access-list 1 permit ^(61000_)+$
route-map mark-voip-data 10
  match community 1
  set ip precedence 5
route-map mark-voip-data 20
  match as-path 1
  set ip precedence 0
router bgp 300
  table-map mark-voip-data
interface GigabitEthernet 0/1
  description Link-to-VOIP-SP
  bgp-policy source ip-prec-map
interface GigabitEthernet 0/2
  description Link-to-Data-SP
  bgp-policy source ip-prec-map

ip cef
ip bgp-community new-format
ip community-list 1 permit 60000:1
ip as-path access-list 1 permit ^(61000_)+$
route-map mark-voip-data 10
  match community 1
  set ip precedence 5
route-map mark-voip-data 20
  match as-path 1
  set ip precedence 0
router bgp 300
  table-map mark-voip-data
interface GigabitEthernet 0/1
  description Link-to-VOIP-SP
  bgp-policy source ip-prec-map
interface GigabitEthernet 0/2
  description Link-to-Data-SP
  bgp-policy source ip-prec-map
```

A.



B.



```
ip cef
ip bgp-community new-format
ip community-list 1 permit 60000:1
ip as-path access-list 1 permit ^(61000_)+$
route-map mark-voip-data 10
  match community 1
  set ip precedence 5
route-map mark-voip-data 20
  match as-path 1
  set ip precedence 0
router bgp 300
  table-map mark-voip-data
interface GigabitEthernet 0/1
  description Link-to-VOIP-SP
  bgp-policy source ip-prec-map
interface GigabitEthernet 0/2
  description Link-to-Data-SP
  bgp-policy destination ip-prec-map

ip cef
ip community-list 1 permit 61000:1
ip as-path access-list 1 permit ^(60000_)+$
route-map mark-voip-data 10
  match community 1
  set ip precedence 5
route-map mark-voip-data 20
  match as-path 1
  set ip precedence 0
router bgp 300
  table-map mark-voip-data
interface GigabitEthernet 0/1
  description Link-to-VOIP-SP
  bgp-policy source ip-prec-map
interface GigabitEthernet 0/2
  description Link-to-Data-SP
  bgp-policy source ip-prec-map
```



C.

D.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 164** What is a crucial LDP default operating behavior?

- A. LDP uses the solicited mode by default. An LDP label request is sent to the FIB next hop LSR. When the egress router receives the request, it returns message with all the label-mapping information for the LSP is generated.
- B. LDP establishes a TCP session between the PE routers, thus providing label mapping for the LSP
- C. LDP uses downstream unsolicited mode by default. An LSR advertises label mappings to peers without being asked
- D. LDP uses UDP-confirmed messages to establish sessions between PE ingress and egress routers. The UDP messages encode the label information for each LSP and sub-LSP link

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 165** Which two values are class-selector DSCP values? (Choose two.)

- A. 001001
- B. 000111
- C. 111000
- D. 100000
- E. 000001

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 166**

Refer to the exhibit. Which result occurs from this configuration?

```
ip explicit-path name LSP1 enable
  next-address 10.1.1.1

interface Tunnel100
  ip unnumbered Loopback0
  tunnel destination 192.168.1.2
  tunnel mode mpls traffic-eng
  tunnel mpls traffic-eng bandwidth 65000
  tunnel mpls traffic-eng path-option 1 explicit name LSP1
```

- A. The tunnel comes up because of the explicit path configuration and disregards all CSPF calculations
- B. If the explicit path becomes unavailable, the tunnel falls back to dynamic routing paths
- C. If the explicit path becomes unavailable, the tunnel fails
- D. The traffic through the tunnel is limited to 65,000 Kbps of bandwidth

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 167** Which two values must be specified in a Cisco NBAR configuration? (Choose two.)

- A. port number
- B. IP precedence
- C. neighbor discovery address
- D. CoS
- E. transport protocol

**Correct Answer:** AE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 168** Which configuration set enables outbound label filtering so that only peer 192.168.10.1 receives label advertisements in an MPLS environment? A.

```
mpls ldp
  label
    accept
    for pfx_acl from 192.168.10.1

ipv4 access-list pfx_acl
  10 permit ip host 10.0.0.0 any
ipv4 access-list peer_acl
  10 permit ip host 192.168.10.1 any

mpls ldp
  label
    accept
    for peer_acl from 192.168.10.1

ipv4 access-list pfx_acl
  10 permit ip any host 10.0.0.0
ipv4 access-list peer_acl
  10 permit ip host 192.168.10.1 any

mpls ldp
  label
    advertise
    for pfx_acl to peer_acl
    interface TenGigabitEthernet3/1

ipv4 access-list pfx_acl
  10 permit ip host 10.0.0.0 any
ipv4 access-list peer_acl
  10 permit ip host 192.168.10.1 any

mpls ldp
  label
    advertise
    disable
    for pfx_acl to peer_acl
    interface TenGigabitEthernet3/1

ipv4 access-list pfx_acl
  10 permit ip host 10.0.0.0 any
ipv4 access-list peer_acl
  10 permit ip host 192.168.10.1 any
```

B.

C.



D.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 169** Which class-map configuration selects the following traffic?

- All incoming traffic from interface GigabitEthernet 0/1 that is marked with dscp ef A.

```
class-map TEST
  match dscp ef
  match input-interface GigabitEthernet 0/1
```

```
class-map TEST1
  match dscp ef
```

```
class-map TEST2
  match input-interface GigabitEthernet 0/1
```

```
class-map match-all PARENT
  match class-map TEST1 TEST2
```

```
class-map match-any TEST
  match dscp ef
  match input-interface GigabitEthernet 0/1
```

```
class-map match-any TEST
  match dscp ef match input-interface GigabitEthernet 0/1
```

B.

C.

D.

**Correct Answer:** A

**Section:** (none)

**Explanation**



**Explanation/Reference:**

**QUESTION 170**

You are configuring MPLS LDP in a new network segment and notice that LDP sessions are discovered but no sessions are established. Which issue is preventing the establishment of the LDP neighbors?

- A. The loopback addresses of the label switch routers are unavailable
- B. MPLS labels are not allocated for local routers
- C. IP Cisco Express Forwarding is disabled on the label switch routers
- D. An access link is blocking TCP port 711 on the MPLS routers

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 171**

A service provider runs MPLS in its core. What is the relationship between FIB, LIB, and LFIB in this environment?

- A. Data from the FIB and LIB tables is used to generate the LFIB
- B. The FIB, LIB, and LFIB are populated independently
- C. The LIB and FIB are populated with labels and next-hop attributes in the control plane and are used to populate the LFIB
- D. The LFIB is populated with information from the IP routing table and is shared with the FIB and LIB to assign labels to the path

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 172** What is the function of MPLS FRR?

- A. automatically repairs LDP adjacency issues for MPLS TE tunnel endpoints
- B. automatically updates BGP prefixes during link failures
- C. automatically redirects MPLS TE traffic away from degraded links
- D. routes traffic onto a backup MPLS TE tunnel during link failures

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 173**

Refer to the exhibit. A network engineer who is working for an ISP wants to override the QoS that comes from the customer. The engineer wants to set a QoS value of 5 for all traffic. What are two reasons why the configuration is not working? (Choose two.)

```
PE1 (config)#class-map Custom1
PE1 (config-cmap)#match all
PE1 (config)#policy-map QoSCustom1
PE1 (config-pmap)#class QoSCustom1
PE1 (config-pmap-c)#set mpls experimental 0
PE1 (config) # interface Gig1/0/0
PE1 (config-if) # xconnect 172.16.1.1 350 encapsulation mpls
PE1 (config-if) # service-policy input Custom1
```

- A. The **service-policy** command should point to the service policy, not to the class map
- B. The **set** command should reference CoS instead of MPLS EXP bits
- C. The **service-policy** configuration should be set as output
- D. The **policy-map** configuration needs to reference **class-map Custom1**
- E. The number **350** in the **xconnect** command should appear after the encapsulation type

**Correct Answer:** AD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 174

Refer to the exhibit/ While configuring traffic shaping, you implement this configuration. Which additional configuration is required?

```
Class-map match-all Class-Data
Match match-not-frde
```

```
policy-map Output-SP-Map
class Class-Data
shape average percent 50
```

- A. a service policy in the outbound direction on the interface
- B. a service policy in the inbound direction on the interfaceC. a default queue
- D. a second class, to match other traffic

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 175** Which high-availability feature does not require communication with other peers?

- A. rLFA
- B. MPLS TE FRR
- C. Nonstop Routing
- D. NSF

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 176** Which two options are true regarding the Pipe and Short Pipe MPLS tunneling models? (Choose two.)

- A. In Short Pipe mode QoS is done on the PE-to-CE link based on the customer's PHB markings
- B. In Pipe mode QoS is done on the PE-to-CE link based on the service provider's PHB markings
- C. In Pipe mode QoS is done on the PE-to-CE link based on the customer's PHB markings
- D. In Short Pipe mode QoS is done on the PE-to-CE link based on the service provider's PHB markings
- E. Short Pipe mode does not need MPLS usage, but Pipe mode does

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 177

Refer to the exhibit. What happens to the traffic that exceeds the CIR?

```
class-map match-all QoSMPLS
  match access-group 1
!
policy-map MPLStag
  class QoSMPLS
    police cir 10000 pir 9999500
      conform-action set-mpls-exp-imposition-transmit 5
      exceed-action set-mpls-exp-imposition-transmit 0
      violate-action drop
!
access-list 1 permit 192.168.1.0 0.0.0.255
```

- A. It is set an EXP value of 5 and transmitted
- B. It is set an EXP value of 5 and dropped
- C. It is set an EXP value of 0 and transmitted
- D. It is set an EXP value of 3 and dropped

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### QUESTION 178

Refer to the exhibit. What is the available reservable bandwidth for P6 after successful establishment of Tunnel 1?

```
interface GigabitEthernet1/0
  ip rsvp bandwidth 500000
!
interface Tunnell
  tunnel mpls traffic-eng bandwidth 10000
  tunnel mpls traffic-eng priority 3
```

- A. 490 Kbps
- B. 500 Kbps
- C. 490 Mbps
- D. 500 Mbps

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 179

Refer to the exhibit. You are about to implement security features, including this configuration, within the MPLS network of a large MPLS service provider. How does the router distribute the labels to its neighbors?

**MPLS\_Router\_A**

```
Interface Gi 0/0/0
"link to MPLS_PE_C"
mpls ip

Interface Gi 0/0/1
"Link facing customer_A CE"
IP access-group X in

!
mpls ldp advertise-labels for 80 to 81

!
access-list 80 permit 10.100.0.0 0.0.0.255
access-list 81 permit any

ip access-list X deny top any any eq 646
ip access-list X permit ip any any
```

- A. All network 10.100.0.0/24 labels are sent to all TDP neighbors
- B. All network 10.100.0.0/16 labels are sent to all LDP neighbors
- C. All network 10.100.0.0/24 labels are sent to all LDP neighbors
- D. All network 10.100.0.0/24 labels are sent to all LDP and TDP neighbors

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 180**

A network engineer wants to implement QoS in an environment in which GRE tunnels are used. The engineer creates a policy map to classify the traffic and applies the map to the physical interface. Despite a successful ping to the end of the tunnel, the counter of the class-map ICMP does not register a hit. How can the engineer fix this problem?

- A. enable QoS preclassify in the tunnel interface
- B. send the ping with source tunnel 0
- C. send the ping with source F0/0
- D. enable QoS preclassify in the physical interface

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 181**

Refer to the exhibit. This WRED policy configuration is implemented on an IOS XR router. What is the measurement of the numbers in the random-detect precedence command?



```
policy-map wred
  class wred
    bandwidth 10000
    random-detect precedence 0 30 40
```

- A. bytes
- B. number of packets
- C. kilobytes
- D. milliseconds

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 182** Which IOS XR Software feature supports establishing point-to-point and point-to-multipoint TE tunnels traversing multiple IGP areas and levels allowing headend and tailend routers to reside in different areas?

- A. loose hop reoptimization
- B. FRR mode protection
- C. interarea support
- D. loose hop expansion

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 183** An engineer wants to implement constraint-based routing. Which MPLS application should the engineer use?

- A. unicast IP routing
- B. MPLS VPN
- C. MPLS TE
- D. RSVP

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 184** Which two protocols facilitate label bindings by neighboring routers? (Choose two.)

- A. IS-IS
- B. LDP
- C. OSPF
- D. EIGRP
- E. BGP

**Correct Answer:** BE

Section: (none)  
Explanation

Explanation/Reference:

