Cisco Certified Network Associate (CCNA)

Exam 200-301
Cisco Certified Network Associate (CCNA 2026)

Demo Questions

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200-301: Cisco Certified Network Associate 2026

QUESTION 1

What is the different between the TCP and UDP protocols?

A. TCP manages multicast and broadcast data transfers, and UDP only handles unicast communications.
B. TCP is used to ensure data integrity in a file transfer, and UDP is used to broadcast a message to multiple recipients.
C. TCP is used for transmitting data over the internet, and UDP is used for transmitting data over a local network.
D. TCP ensures ordered, reliable data delivery, and UDP offers low latency and high throughput.

Answer: D

TCP (Transmission Control Protocol) is a connection-oriented protocol that ensures reliable and ordered delivery of data. It uses mechanisms like acknowledgments and retransmissions to guarantee data integrity and order.

UDP (User Datagram Protocol) is a connectionless protocol that prioritizes speed and efficiency over reliability. It is commonly used for applications requiring low latency, such as video streaming or online gaming, where occasional data loss is acceptable.

Why the other options are incorrect:

A. TCP manages multicast and broadcast data transfers, and UDP only handles unicast communications: This is incorrect because UDP supports multicast and broadcast, while TCP does not.

B. TCP is used to ensure data integrity in a file transfer, and UDP is used to broadcast a message to multiple recipients: While TCP ensures data integrity, UDP is not limited to broadcasting; it also supports unicast and multicast.

C. TCP is used for transmitting data over the internet, and UDP is used for transmitting data over a local network: Both TCP and UDP can be used over the internet and local networks, depending on the application.

QUESTION 2

What is a characteristic of Layer 2 switch?

A. uses the data link layer for communications.
B. uses routers to create collision domains.
C. responsible for sending data in a particular sequence.
D. avoids MAC address storage for faster transmission.

Answer: A

Layer 2 switches operate at the Data Link Layer of the OSI model and primarily use MAC addresses to forward frames within a local area network (LAN). Here's why that stands out:

- Frame forwarding by MAC address: Switches build and use a MAC address table to determine where to send traffic.
- Collision domain separation: While switches help reduce collisions by segmenting the network, it’s routers that define boundaries between broadcast domains.

QUESTION 3

Why would a network administrator choose to implement RFC 1918 address space?

A. to provide flexibility in the IP network design.
B. to limit the number of hosts on the network.
C. to provide overlapping address space with another network.
D. to route traffic on the internet.

Answer: A

RFC 1918 defines **private IP address ranges** that aren't routable on the public internet, and network administrators often use them for internal networks. Here's why:

- **Design flexibility:** Admins can assign IP addresses freely within an organization without coordination from external authorities.
- **Isolation from the public internet:** These addresses provide an internal layer of security by not being globally reachable.
- **Support for NAT (Network Address Translation):** Private IPs allow multiple devices to share a single public IP for outbound traffic, conserving address space.

Let's clear up the other options:

B: You can still have thousands of hosts - limiting isn't the main goal.

C: Overlapping address space is a side effect sometimes dealt with in mergers, but not a reason to implement RFC 1918.

D: Private IPs cannot be routed over the public internet - that's their defining trait.

QUESTION 4

How does MAC learning function?

A. overwrites the known source MAC address in the address table.
B. forwards frame to a neighbor port using CDP.
C. protects against denial of service attacks.
D. enable by default on all VLANs and interfaces.

Answer: D

What MAC Learning Really Does:

- When a switch receives an Ethernet frame, it checks the source MAC address.
- Then it learns which interface (or port) that MAC address is associated with.
- It updates the MAC address table with this mapping — helping it efficiently forward future traffic.

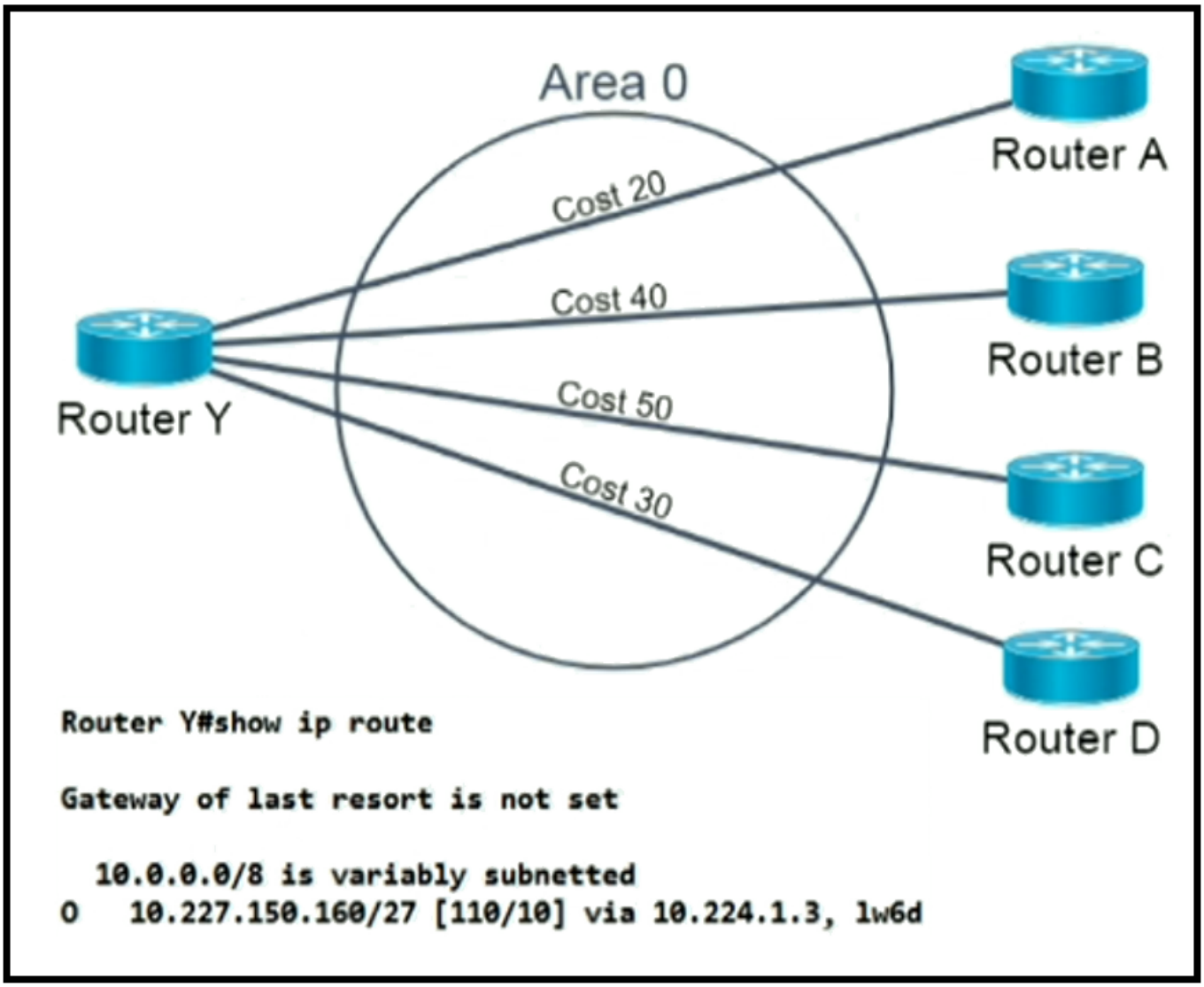
Why D is correct:

- This learning process is on by default across all VLANs and interfaces on standard switches.
- It's fundamental to how Layer 2 switching works — no extra config needed.

Why the others aren't it:

Option	Why it's incorrect
A. Overwrites known MAC	It updates only if the MAC moves ports — not as a default behavior
B. CDP-based forwarding	CDP (Cisco Discovery Protocol) is for device discovery, not traffic forwarding
C. Protects against DoS	MAC learning isn't about security — it's about traffic direction

QUESTION 5



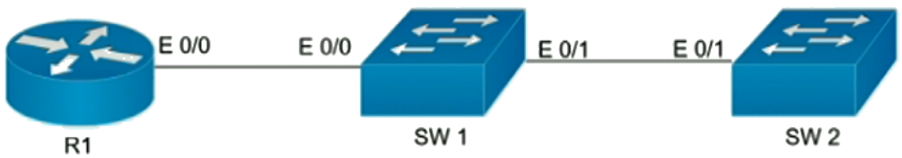
Refer to the exhibit. OSPF neighbors routers A, B, C, and D are sending a route for 10.227.150.160/27. When the current route for 10.227.150.160/27 becomes unavailable, which cost will router Y use to route traffic to 10.227.150.160/27?

A. cost 20
B. cost 30
C. cost 40
D. cost 50

Answer: A

根據圖中的 routing table 顯示，Router Y 現在使用中的路徑成本為 10，而題目話 Router A, B, C, D 都透過 OSPF 發布路徑給 Router Y 都可以去到相同目的地，四條路徑之中 Router A 的成本最低 (Cost = 20)，所以 Router Y 會改用 Router A 前往目的地 10.227.150.160/27。

QUESTION 6



R1:	SW1:	SW2:
interface Ethernet0/0 no ip address !	interface Ethernet0/0 switchport trunk encapsulation dot1q switchport mode trunk ! interface Ethernet0/1 switchport trunk allowed vlan 10 switchport trunk encapsulation dot1q switchport mode trunk	interface Ethernet0/1 switchport trunk encapsulation dot1q switchport mode trunk ! interface Ethernet0/2 switchport access vlan 20 switchport mode access

Refer to the exhibit. Which commands are needed to add a sub-interface to Ethernet0/0 on R1 to allow for VLAN 20, with IP address 10.20.20.1/24?

A.
```
R1(config)# interface ethernet0/0
R1(config-if)# ip address 10.20.20.1 255.255.255.0
```

B.
```
R1(config)# interface ethernet0/0
R1(config-if)# encapsulation dot1q 20
R1(config-if)# ip address 10.20.20.1 255.255.255.0
```

C.
```
R1(config)# interface ethernet0/0.20
R1(config-if)# ip address 10.20.20.1 255.255.255.0
```

D.
```
R1(config)# interface ethernet0/0.20
R1(config-if)# encapsulation dot1q 20
R1(config-if)# ip address 10.20.20.1 255.255.255.0
```

Answer: D

要在 router 建立 sub-interface 作為 VLAN 之間的 routing，介面編號後面必須要有小數代表，例如 Ethernet0/**0.20**，還要設定 **IEEE 802.1Q** 的 VLAN trunk encapsulation 包封模式，所以只有答案 D 正確。

QUESTION 7

What is a characteristic of a Layer 2 switch?

A. supports segmentation using tagging protocols
B. tracks the number of active TCP connections
C. maintains stateful transaction information
D. filters based on a transport layer protocol

Answer: A

This is a key characteristic of a **Layer 2 switch**, which operates at the Data Link layer of the OSI model. Layer 2 switches use MAC addresses to forward frames and can support VLANs (Virtual LANs) by applying tagging protocols like IEEE 802.1Q. This allows segmentation of the network into multiple broadcast domains.

QUESTION 8

Which interface is used to send traffic to the destination network?

O 10.15.167.141/29 [110/6292] via F0/5

O 10.15.167.141/29 [110/28805] via F0/8

R 10.15.167.141/29 [120/11] via F0/10

R 10.15.167.141/29 [120/4] via F0/18

A. F0/5

B. F0/8

C. F0/10

D. F0/18

Answer: A

- "O" means the route was learned via **OSPF** with administrative distance **110**
- "R" means the route was learned via **RIP** with administrative distance **120**
- The number in brackets [AD/Metric] represents **administrative distance** and **metric**
- **Lower administrative distance (AD)** is preferred
- **If ADs are equal**, then the lower metric wins

Route	**AD**	**Metric**	**Interface**
O via F0/5	110	6292	F0/5
O via F0/8	110	28805	F0/8
R via F0/10	120	11	F0/10
R via F0/18	120	4	F0/18

Since OSPF (AD 110) has lower administrative distance than RIP (AD 120), we pick one of the **OSPF routes**. Among those, F0/5 has the lower metric of 6292 compared to F0/8's 28805. **so the answer is A. F0/5**

QUESTION 9

An engineer must update the configuration on two PCs in two different subnets to communicate locally with each other. One PC is configured with IP address 192.168.25.128/25 and the other with 192.168.25.100/25. Which network mask must the engineer configure on both PCs to enable the communication?

A. 255.255.255.0

B. 255.255.255.224

C. 255.255.255.248

D. 255.255.255.252

Answer: A

The IP addresses **192.168.25.128/25** and **192.168.25.100/25** are in different subnets when using a **/25** mask (255.255.255.128). The subnet range for 192.168.25.128/25 is 192.168.25.128 - 192.168.25.255, while the range for 192.168.25.100/25 is 192.168.25.0 - 192.168.25.127. These ranges do not overlap, so the PCs cannot communicate locally. To enable communication, the engineer must use a **255.255.255.0** subnet mask **(/24)**, which combines both subnets into a single range: **192.168.25.0 - 192.168.25.255**. This allows both PCs to communicate locally.

QUESTION 10

When a WPA2-PSK WLAN is configured in the Wireless LAN Controller, what is the minimum number of characters that is required in ASCII format?

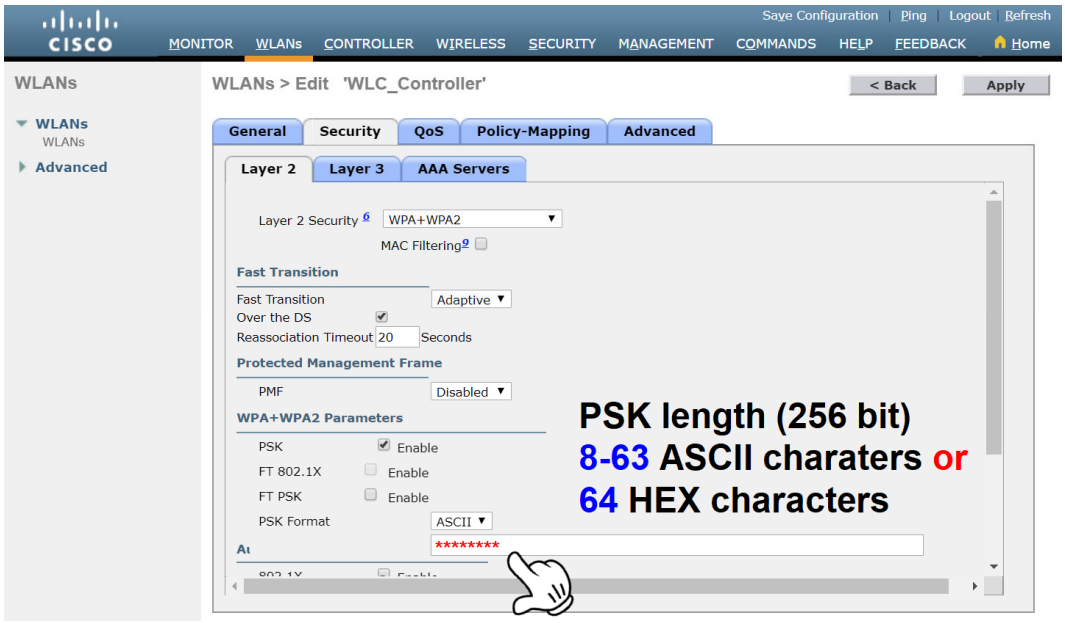
A. 6

B. 8

C. 12

D. 18

Answer: B



QUESTION 11

What is the difference between the TCP and UDP protocols?

A. TCP has a 20-byte minimal header size, and UDP has an 8-byte header size.

B. TCP uses only a checksum, and UDP has an acknowledgment mechanism.

C. TCP requires five packets to set up a connection, and UDP requires only three packets.

D. TCP has an inherent order for packet assembly, and UDP reassembles packets in a specific order.

Answer: A

Correct Answer: A. TCP has a 20-byte minimal header size, and UDP has an 8-byte header size.

Here's why the other options don't hold up:

Why It's Incorrect

✕ **B. UDP does not use acknowledgments** - it's a connectionless protocol. TCP, on the other hand, ensures reliability with acknowledgments and checksums.

✕ **C. TCP uses a three-way handshake to establish a connection** (not five packets). UDP doesn't require a handshake at all.

✕ **D. UDP does not guarantee order** - packets can arrive out of sequence. TCP does ensure ordered delivery thanks to its sequence numbers.

So if you're building something that needs speed and simplicity (like video streaming), UDP might be the way to go. But if you need reliability (like web browsing or file transfers), TCP's your trusty friend.

QUESTION 12

Which cable type must be used when connecting a router and switch together using these criteria?

- Pins 1 and 2 are receivers and pins 3 and 6 are transmitters.
- Auto detection MID-X is unavailable.

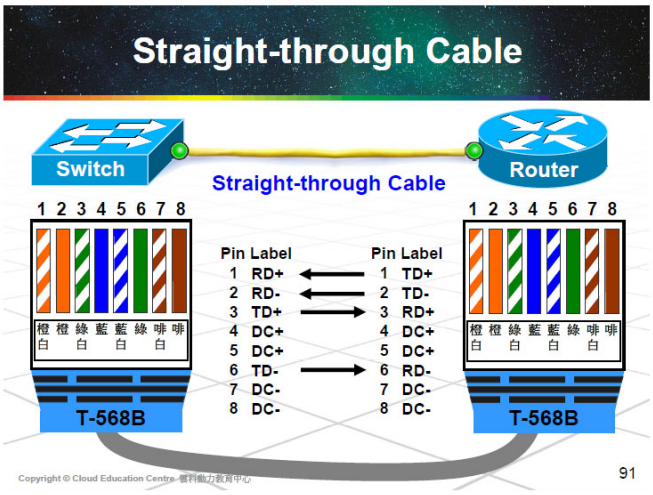
A. crossover

B. straight-through

C. rollover

D. console

Answer: B



QUESTION 13

Which cable type must be used when connecting two like devices together using these criteria?

- Pins 1 and 3 and 2 to 6 are required.
- Auto detection MID-X is unavailable.

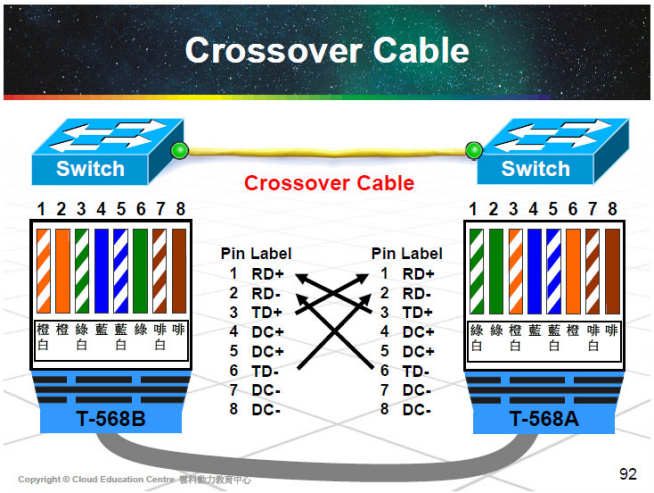
A. crossover

B. straight-through

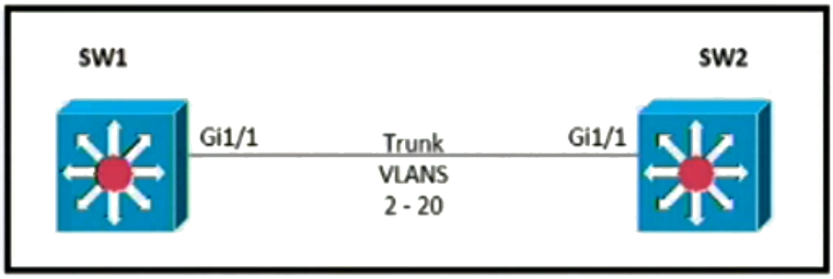
C. rollover

D. console

Answer: A



QUESTION 14



Refer to the exhibit. Which command must be executed for Gi1/1 on SW1 to passively become a trunk port if Gi1/1 on SW2 is configured in desirable or trunk mode?

A. `switchport mode trunk`
B. `switchport mode dynamic auto`
C. `switchport mode dynamic desirable`
D. `switchport mode dot1-tunnel`

Answer: B

To passively convert Gi1/1 on SW1 into a **trunk port** when SW2's interface is configured as **dynamic desirable** or **trunk**, we need to rely on Dynamic Trunking Protocol (DTP).

Here's what each option does:

A. switchport mode trunk - Forces trunking, no negotiation.

B. switchport mode dynamic auto - Passive mode that waits for the other side to initiate trunking.

C. switchport mode dynamic desirable - Actively attempts to form a trunk.

D. switchport mode dot1-tunnel - Used for tunneling Layer 2 frames, unrelated to trunk negotiation.

Correct Answer: B. `switchport mode dynamic auto`

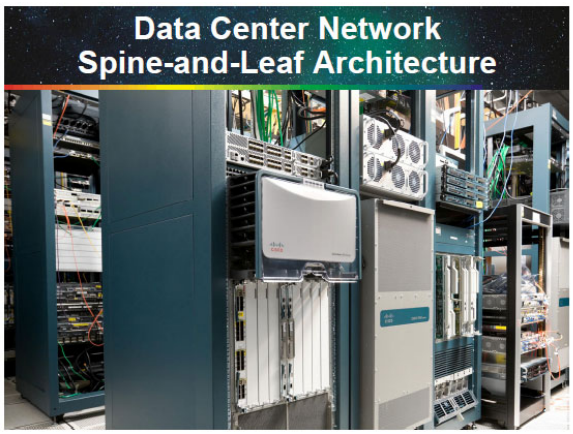
This allows SW1 to passively become a trunk if SW2 sends a DTP negotiation (via dynamic desirable or trunk mode).

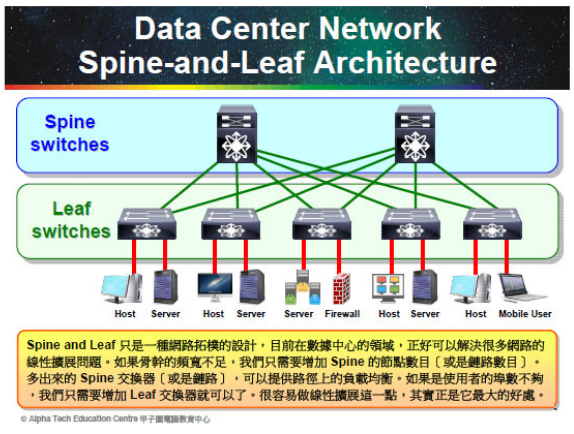
QUESTION 15

How are the switches in a spine-and-leaf topology interconnected?

A. Each leaf switch is connected to a central leaf switch, the uplinked to a core spine switch
B. Each leaf switch is connected to two spine switches, making a loop
C. Each leaf switch is connected to one of the spine switches
D. Each leaf switch is connected to each spine switch

Answer: D



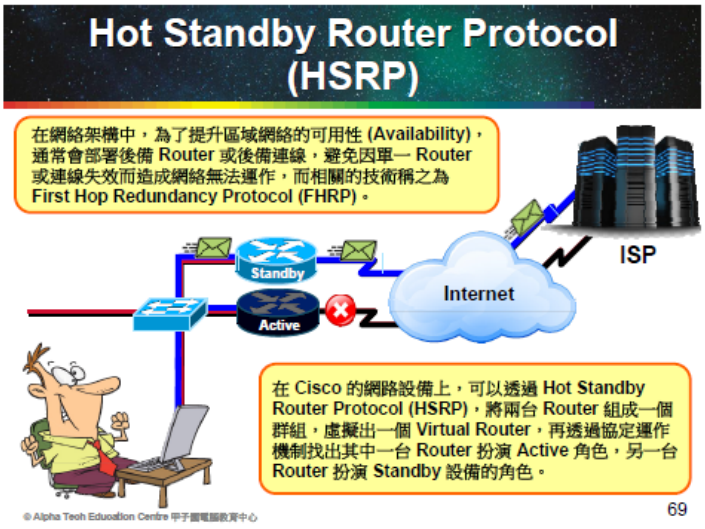


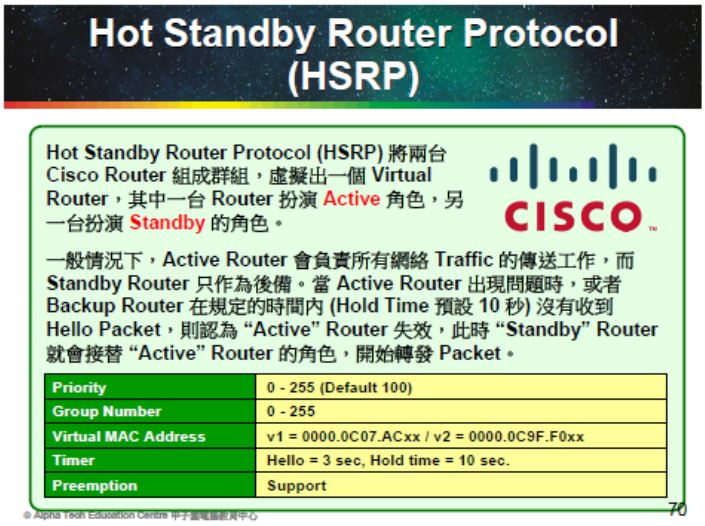
UESTION 16

How does HSRP provide first hop redundancy?

A. It load-balances Layer 2 traffic along the path by flooding traffic out all interfaces configured with the same VLAN.
B. It load-balances traffic by assigning the same metric value to more than one route to the same destination in the IP routing table.
C. It uses a shared virtual MAC and a virtual IP address to a group of routers that serve as the default gateway for hosts on a LAN.
D. It forwards multiple packets to the same destination over different routed links in the data path.

Answer: C





QUESTION 17

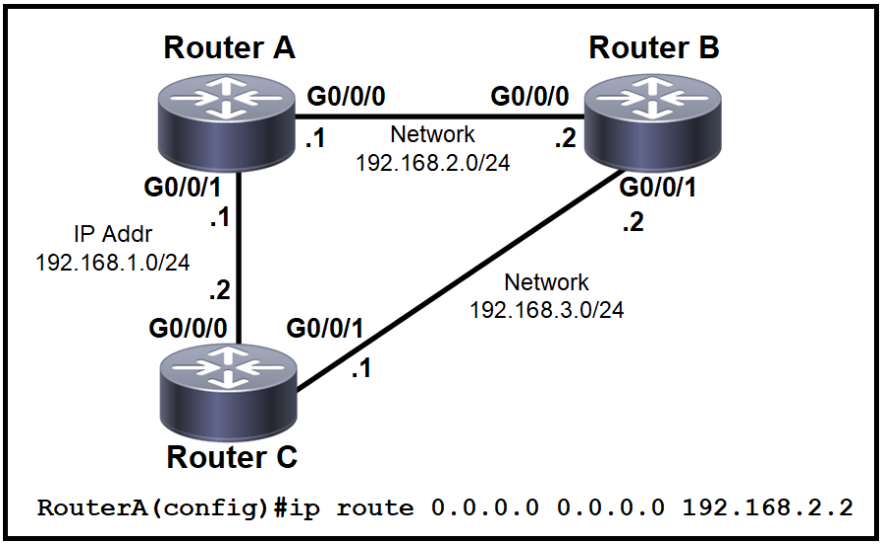
How does MAC learning function?

A. drops received MAC addresses not listed in the address table.
B. restricts ports to a maximum of 10 dynamically-learned addresses.
C. increases security on the management VLAN.
D. associates the MAC address with the port on which it is received.

Answer: D

- MAC learning is the process by which a switch builds its MAC address table (CAM table).
- When a frame arrives at a port, the switch looks at the source MAC address in the Ethernet header.
- It then records that MAC address in its table and associates it with the specific port where the frame was received.
- This allows the switch to know where to forward future frames destined for that MAC address, instead of flooding them out all ports.

QUESTION 18



Refer to the exhibit. Which command must be issued to enable a floating static default route on router A?

A. **`ip route 0.0.0.0 0.0.0.0 192.168.1.2`**
B. **`ip route 0.0.0.0 0.0.0.0 192.168.1.2 10`**
C. **`ip route 0.0.0.0 0.0.0.0 192.168.2.1 10`**
D. **`ip default-gateway 192.168.2.1`**

Answer: B

Router A 內已經有一條 default route 指去 Router B 的 192.168.2.2，如果想再加一條 floating static default route 作為後備指去 Router C，指令後面應該有個數字代表 AD，所以正確答案為 B。

QUESTION 19

```
Cat9K-1# show lldp entry Cat9K-2

Local Intf: Gi1/0/21
Chassis id: 308b.b2b3.2880
Port id: Gi1/0/21
Port Description: GigabitEthernet1/0/21
System Name: Cat9K-2

Management Addresses:
   IP: 10.5.110.2
```

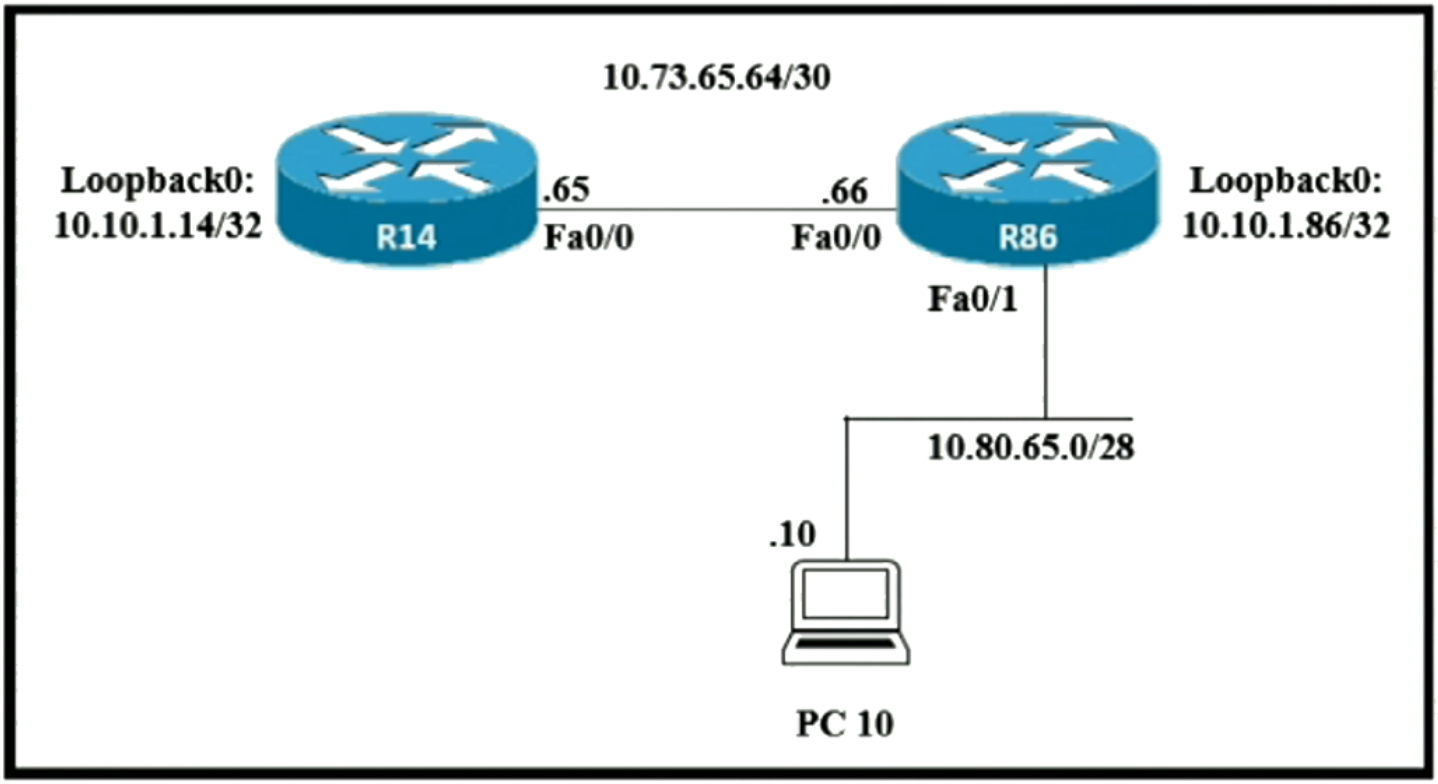
Refer to the exhibit. The network administrator must prevent the switch Cat9K-2 IP address from being visible in LLDP without disabling the protocol. Which action must be taken to complete the task?

A. Configure the **`no lldp transmit`** command on interface G1/0/21 on Cat9K-1.
B. Configure the **`no lldp receive`** command on interface G1/0/21 on Cat9K-1.
C. Configure the **`no lldp mac-phy-cfg`** command globally on Cat9K-2.
D. Configure the **`no lldp tlv-select management-address`** command globally on Cat9K-2.

Answer: D

只要在 Cat9K-2 執行 **`no lldp tlv-select management-address`** 便可以在不需要終止執行 LLDP 的情況下便可以停止發佈 IP address 資料。

QUESTION 20



Refer to the exhibit. Router R14 is in the process of being configured. Which configuration must be used to establish a host route to PC 10?

A. `ip route 10.73.65.65 255.0.0.0 10.80.65.10`

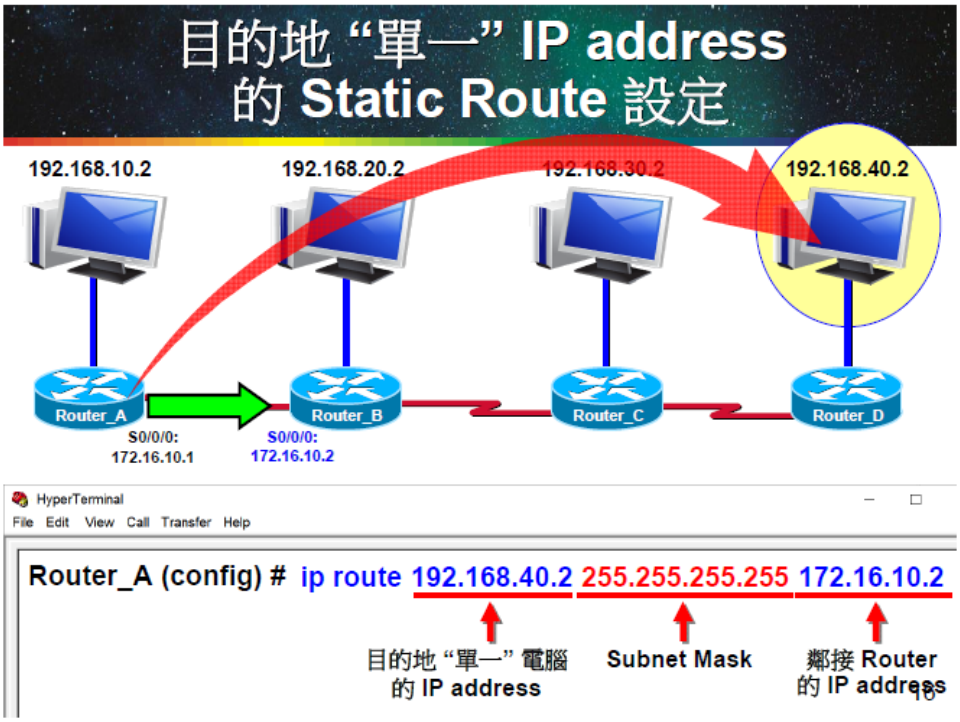
B. `ip route 10.73.65.65 0.0.0.255 10.80.65.10`

C. `ip route 10.80.65.10 255.255.255.252 10.80.65.1`

D. `ip route 10.80.65.10 255.255.255.255 10.73.65.66`

Answer: D

要建立 static host route ，subnet mask 必須係 255.255.255.255 由頭包到尾。



QUESTION 21

When deploying syslog, which severity level logs informational messages?

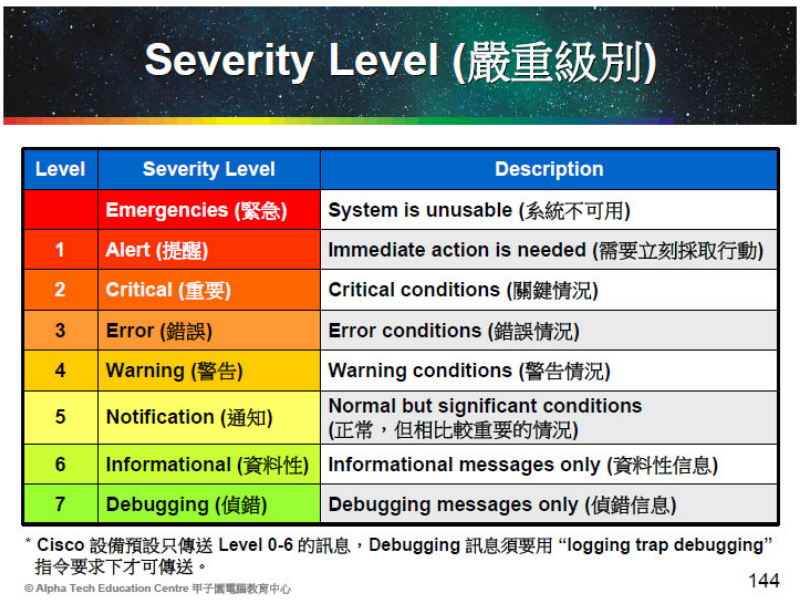
A. 0

B. 2

C. 4

D. 6

Answer: D



QUESTION 22

What is a characteristic of private IPv4 addressing?

A. used without allocation from a regional internet authority

B. reduces the forwarding table on network routers

C. traverses the internet when an outbound ACL is applied

D. enables secure connectivity over the internet

Answer: A

Private IPv4 addresses are defined by **RFC 1918** and are reserved for use within internal networks such as homes, enterprises, and campuses. These addresses:

- Do not require registration with a regional internet registry (like ARIN or RIPE)
- Cannot be routed over the public internet
- Are commonly used with Network Address Translation (NAT) to allow internal devices to access the internet

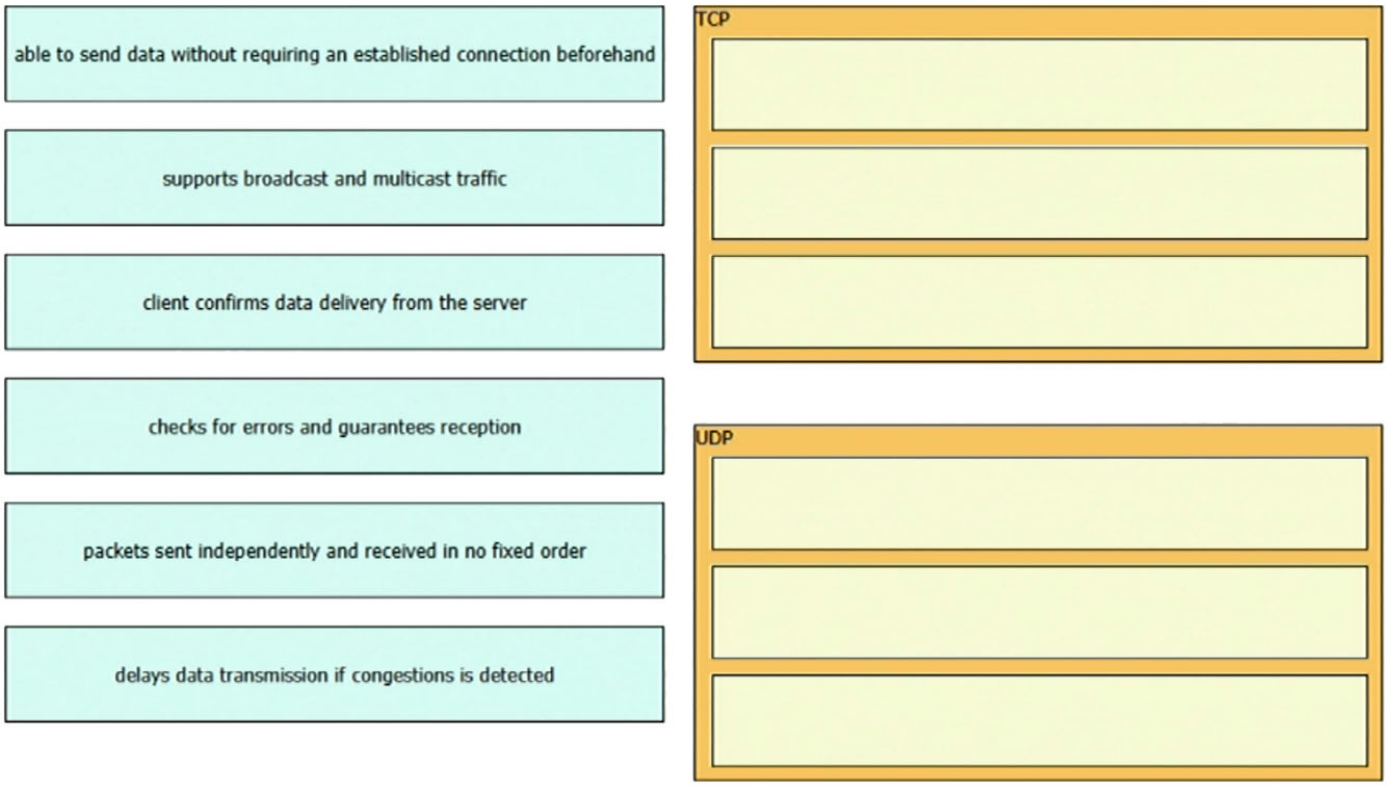
RFC 1918 Private IP Ranges:

Class	Range
A	10.0.0.0 – 10.255.255.255
B	172.16.0.0 – 172.31.255.255
C	192.168.0.0 – 192.168.255.255

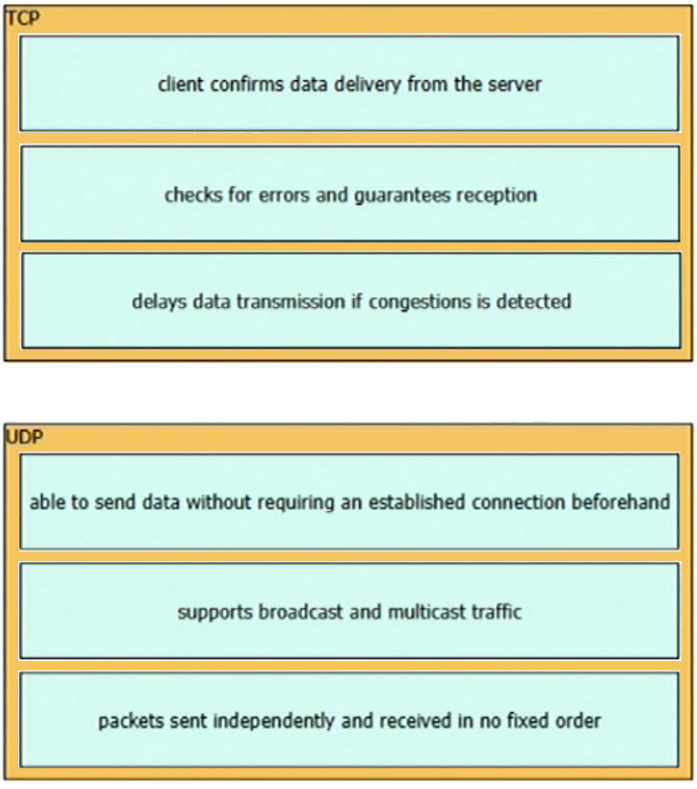
Drag and Drop Questions

QUESTION 1

Drag and drop the transport layer descriptions from the left onto the corresponding transport layer protocols that support them on the right.

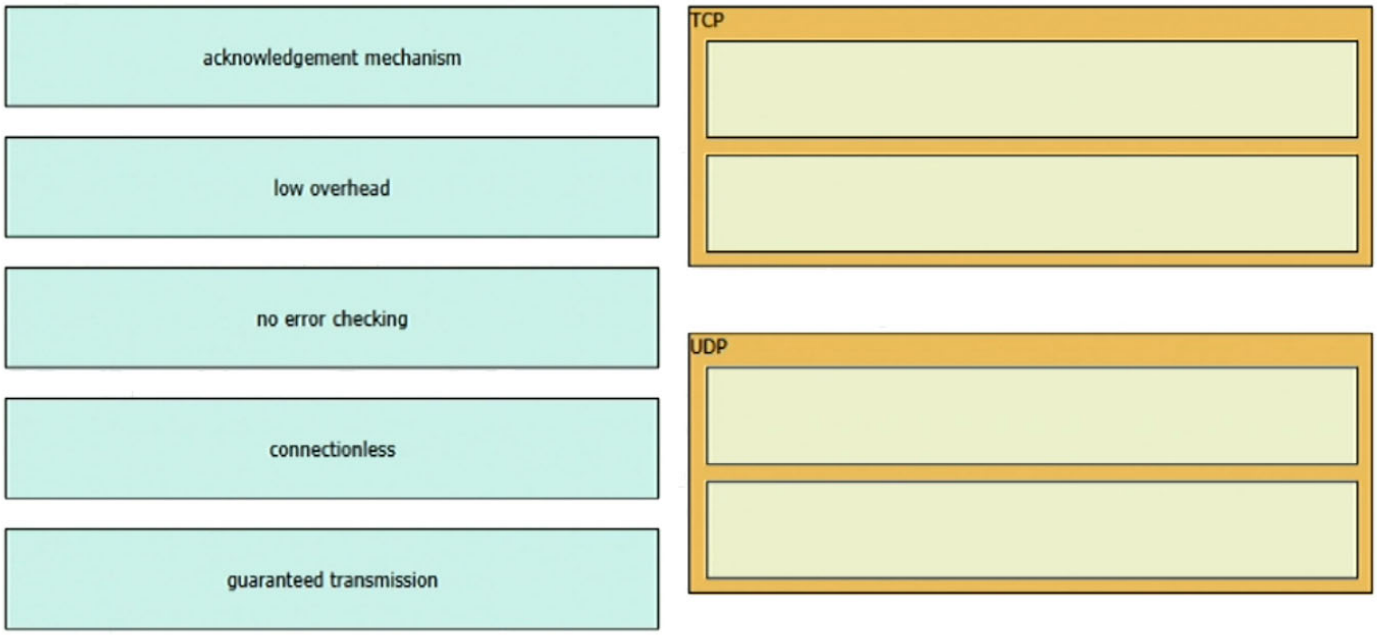


Answer:

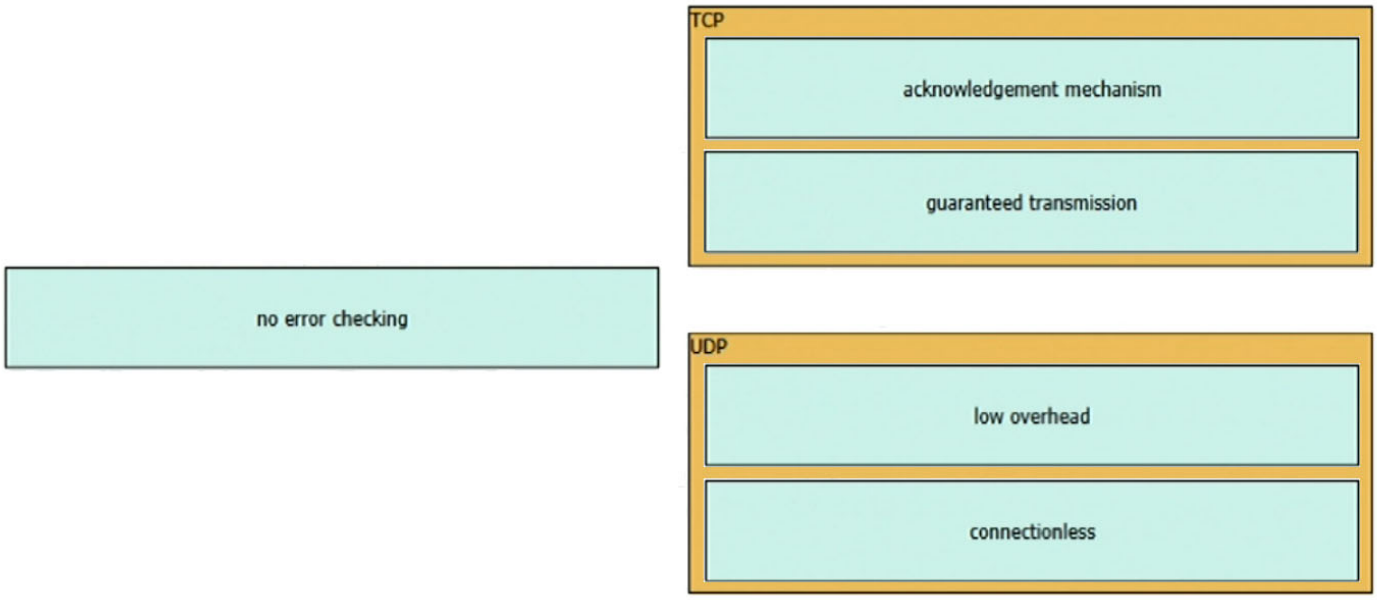


QUESTION 2

Drag and drop the protocol characteristics from the left onto the corresponding types on the right. Not all characteristics are used.



Answer:



TCP (Transmission Control Protocol)

- acknowledgement mechanism
- guaranteed transmission

TCP is connection-oriented and ensures reliable delivery through acknowledgments and retransmissions.

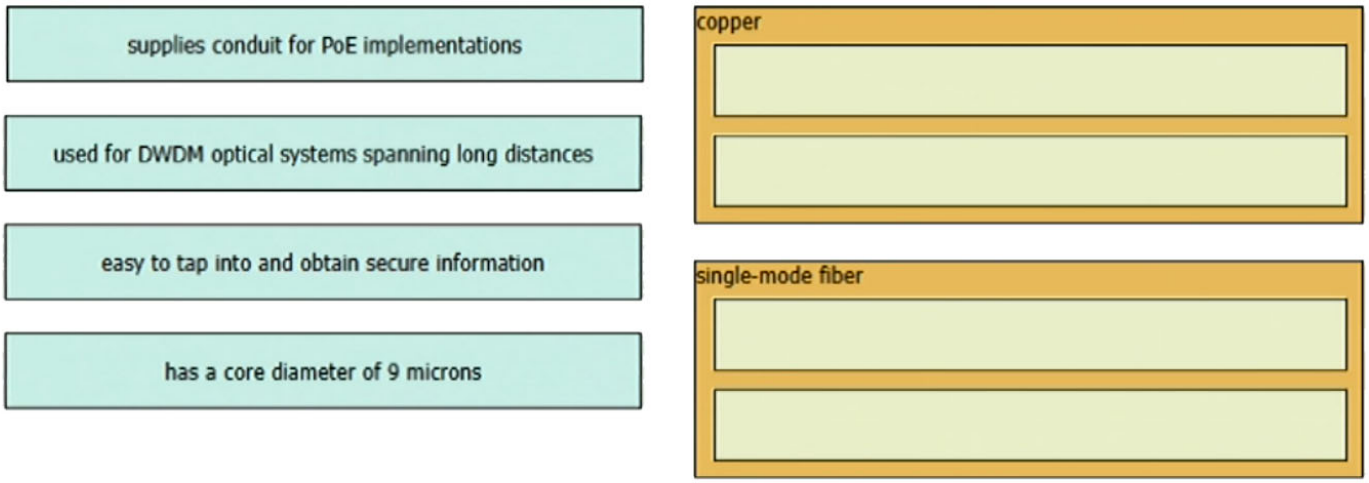
UDP (User Datagram Protocol)

- low overhead
- connectionless

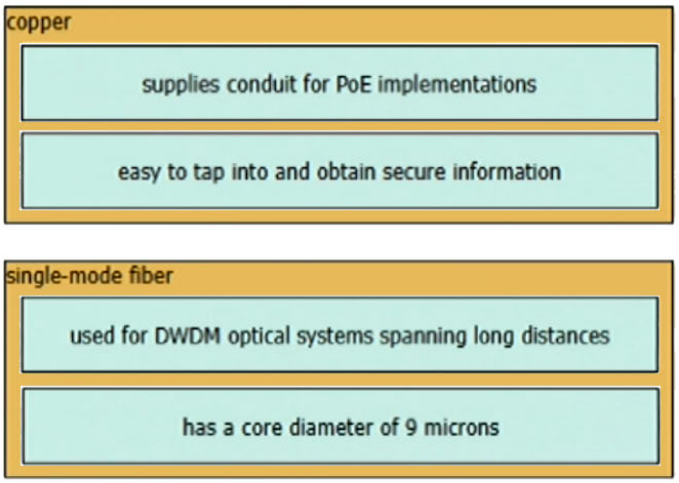
UDP is faster and simpler, ideal for applications like streaming or gaming where speed matters more than reliability.

QUESTION 3

Drag and drop the characteristic from the left onto the cable type on the right.



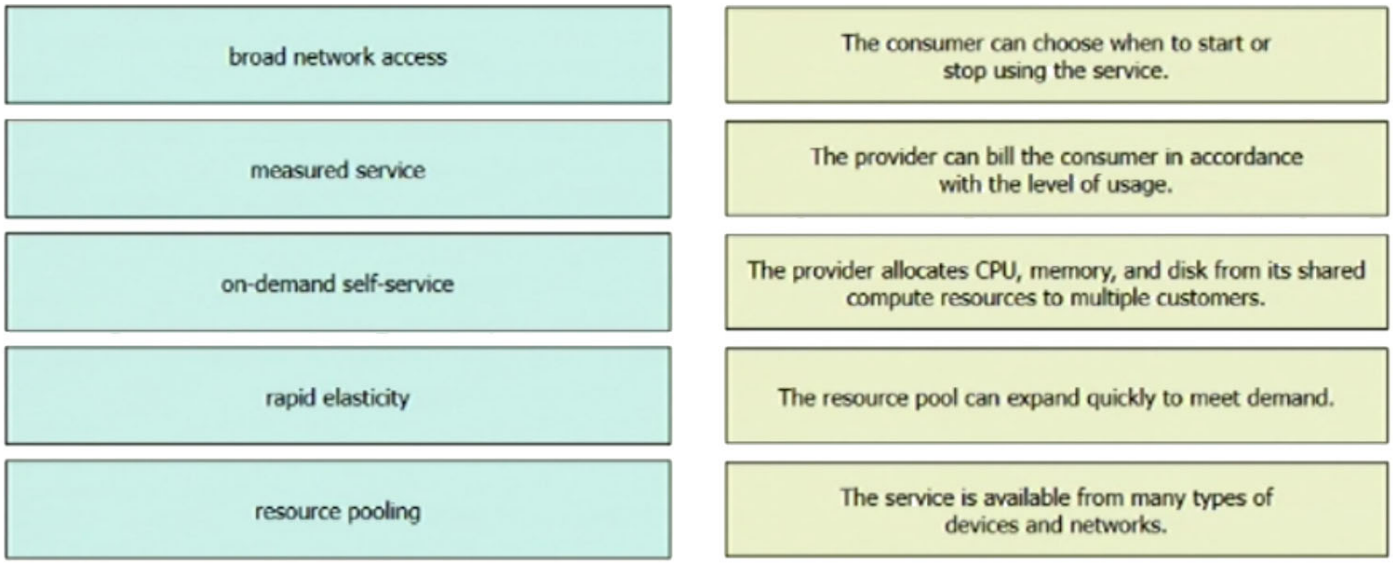
Answer:



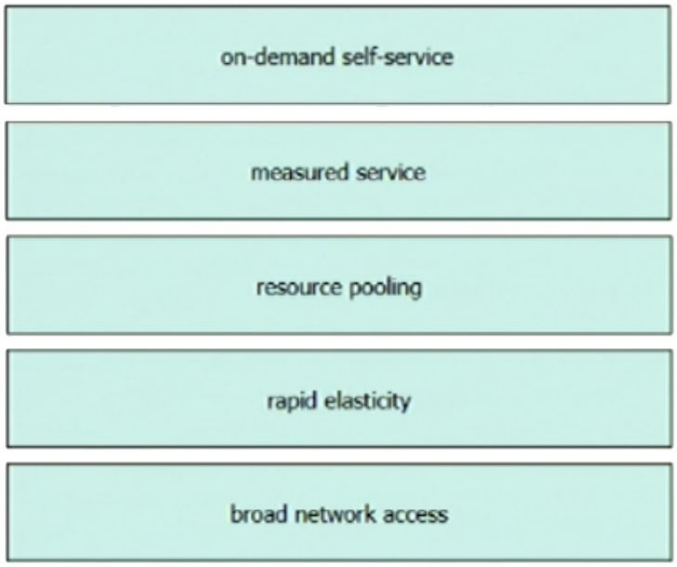
- **Copper** is commonly used for Power over Ethernet (PoE) and is more vulnerable to physical tapping.
- **Single-mode fiber** is ideal for long-distance, high-bandwidth applications like DWDM (Dense Wavelength Division Multiplexing) and has a very narrow core for precise light transmission.

QUESTION 4

Drag and drop the cloud-computing components from the left onto the correct descriptions on the right.



Answer:



Explanation:

These components are essential characteristics of cloud computing as defined by NIST. They ensure scalability, flexibility, and efficiency:

- **Broad network access** allows access via standard platforms like phones, laptops, etc.
- **Measured service** tracks usage and supports pay-as-you-go billing.
- **On-demand self-service** lets users control resources themselves.
- **Rapid elasticity** keeps services responsive during high demand.
- **Resource pooling** enables multi-tenancy, sharing underlying hardware.