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CCNA Exam Answers 2017

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1. **A company is contemplating whether to use a client/server or a peer-to-peer network. What are three characteristics of a peer-to-peer network? (Choose three.)**

- better security
- **easy to create***
- better device performance when acting as both client and server
- **lacks centralized administration ***
- **less cost to implement***
- scalable

Explain:

Because network devices and dedicated servers are not required, peer-to-peer networks are easy to create, less complex, and have lower costs. Peer-to-peer networks also have no centralized administration. They are less secure, not scalable, and those devices acting as both client and server may perform slower.

2. **Which device performs the function of determining the path that messages should take through internetworks?**

- **a router***
- a firewall
- a web server
- a DSL modem

Explain:

A router is used to determine the path that the messages should take through the network. A firewall is used to filter incoming and outgoing traffic. A DSL modem is used to provide Internet connection for a home or an organization.

3. **What two criteria are used to help select a network medium from various network media? (Choose two.)**

- the types of data that need to be prioritized
- the cost of the end devices utilized in the network
- **the distance the selected medium can successfully carry a signal***
- the number of intermediary devices installed in the network
- **the environment where the selected medium is to be installed***

Explain:

Criteria for choosing a network medium are the distance the selected medium can successfully carry a signal, the environment in which the selected medium is to be installed, the amount of data and the speed at which the data must be transmitted, and the cost of the medium and its installation.

4. Which two statements describe intermediary devices? (Choose two.)

- Intermediary devices generate data content.
- Intermediary devices alter data content.
- **Intermediary devices direct the path of the data. ***
- **Intermediary devices connect individual hosts to the network.***
- Intermediary devices initiate the encapsulation process.

Explain:

Applications on end devices generate data, alter data content, and are responsible for initiating the encapsulation process.

5. What are two functions of end devices on a network? (Choose two.)

- **They originate the data that flows through the network.***
- They direct data over alternate paths in the event of link failures.
- They filter the flow of data to enhance security.
- **They are the interface between humans and the communication network.***
- They provide the channel over which the network message travels.

Explain:

End devices originate the data that flows through the network. Intermediary devices direct data over alternate paths in the event of link failures and filter the flow of data to enhance security. Network media provide the channel through which network messages travel.

6. Which area of the network would a college IT staff most likely have to redesign as a direct result of many students bringing their own tablets and smartphones to school to access school resources?

- extranet
- intranet
- wired LAN
- **wireless LAN***
- wireless WAN

Explain:

An extranet is a network area where people or corporate partners external to the company access data. An intranet simply describes the network area that is normally accessed only by internal personnel. The wired LAN is affected by BYODs (bring your own devices) when the devices attach to the wired network. A college wireless LAN is most likely used by the tablet and smartphone. A wireless WAN would more likely be used by college students to access their cell provider network.

7. What type of network must a home user access in order to do online shopping?

- an intranet
- **the Internet***
- an extranet
- a local area network

8. **An employee at a branch office is creating a quote for a customer. In order to do this, the employee needs to access confidential pricing information from internal servers at the Head Office. What type of network would the employee access?**

- **an intranet***
- the Internet
- an extranet
- a local area network

Explain:

Intranet is a term used to refer to a private connection of LANs and WANs that belongs to an organization. An intranet is designed to be accessible only by the organization's members, employees, or others with authorization.

9. **Which two connection options provide an always-on, high-bandwidth Internet connection to computers in a home office? (Choose two.)**

- cellular
- **DSL***
- satellite
- **cable***
- dial-up telephone

Explain:

Cable and DSL both provide high bandwidth, an always on connection, and an Ethernet connection to a host computer or LAN.

10. **Which two Internet connection options do not require that physical cables be run to the building? (Choose two.)**

- DSL
- **cellular***
- **satellite***
- dialup
- dedicated leased line

Explain:

Cellular connectivity requires the use of the cell phone network. Satellite connectivity is often used where physical cabling is not available outside the home or business.

11. **Which term describes the state of a network when the demand on the network resources exceeds the available capacity?**

- convergence
- **congestion***
- optimization
- synchronization

Explain:

When the demand on the network resources exceeds the available capacity, the network becomes congested. A converged network is designed to deliver multiple communication types, such as data, video and voice services, using the same network infrastructure.

12. What type of network traffic requires QoS?

- email
- on-line purchasing
- **video conferencing***
- wiki

13. Which expression accurately defines the term bandwidth?

- a method of limiting the impact of a hardware or software failure on the network
- **a measure of the data carrying capacity of the media***
- a state where the demand on the network resources exceeds the available capacity
- a set of techniques to manage the utilization of network resources

Explain:

A method of limiting the impact of a hardware or software failure is fault tolerance. A measure of the data carrying capacity is bandwidth. A set of techniques to manage the utilization of network resources is QoS. A state where the demand on the network resources exceeds the available capacity is called congestion.

14. A network administrator is implementing a policy that requires strong, complex passwords. Which data protection goal does this policy support?

- data integrity
- data quality
- **data confidentiality***
- data redundancy

15. Which statement describes a characteristic of cloud computing?

- A business can connect directly to the Internet without the use of an ISP.
- **Applications can be accessed over the Internet by individual users or businesses using any device, anywhere in the world.***
- Devices can connect to the Internet through existing electrical wiring.
- Investment in new infrastructure is required in order to access the cloud.

Explain:

Cloud computing allows users to access applications, back up and store files, and perform tasks without

needing additional software or servers. Cloud users access resources through subscription-based or pay-per-use services, in real time, using nothing more than a web browser.

16. Which statement describes the use of powerline networking technology?

- New “smart” electrical cabling is used to extend an existing home LAN.
- A home LAN is installed without the use of physical cabling.
- **A device connects to an existing home LAN using an adapter and an existing electrical outlet.***
- Wireless access points use powerline adapters to distribute data through the home LAN.

Explain:

Powerline networking adds the ability to connect a device to the network using an adapter wherever there is an electrical outlet. The network uses existing electrical wiring to send data. It is not a replacement for physical cabling, but it can add functionality in places where wireless access points cannot be used or cannot reach devices.

17. What security violation would cause the most amount of damage to the life of a home user?

- denial of service to your email server
- replication of worms and viruses in your computer
- **capturing of personal data that leads to identity theft***
- spyware that leads to spam emails

Explain:

On a personal PC, denial of service to servers, worms and viruses, and spyware producing spam emails can be annoying, invasive, and frustrating. However, identity theft can be devastating and life altering. Security solutions should be in place on all personal devices to protect against this type of threat.

18. A user is implementing security on a small office network. Which two actions would provide the minimum security requirements for this network? (Choose two.)

- **implementing a firewall***
- installing a wireless network
- **installing antivirus software***
- implementing an intrusion detection system
- adding a dedicated intrusion prevention device

Explain:

Technically complex security measures such as intrusion prevention and intrusion prevention systems are usually associated with business networks rather than home networks. Installing antivirus software, antimalware software, and implementing a firewall will usually be the minimum requirements for home networks. Installing a home wireless network will not improve network security, and will require further security actions to be taken.

19. A __converged__*network is capable of delivering voice, video, text, and graphics over the same communication channels.

Explain:

When one network is used for all types of communication such as voice, video, text, and graphics, the

network is referred to as a converged network.

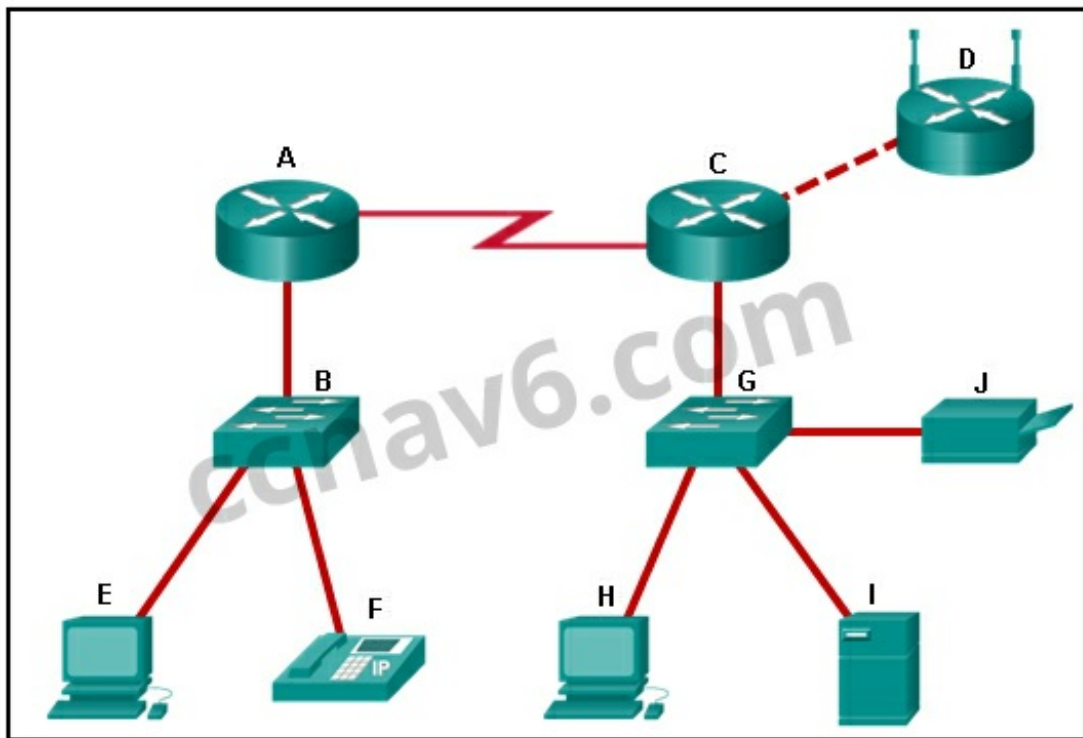
20. Fill in the blank.

The acronym **__byod__*** refers to the policy that allows employees to use their personal devices in the business office to access the network and other resources.

21. What are two functions of intermediary devices on a network? (Choose two.)

- They are the primary source and providers of information and services to end devices.
- They run applications that support collaboration for business.
- They form the interface between the human network and the underlying communication network.
- **They direct data along alternate pathways when there is a link failure.***
- **They filter the flow of data, based on security settings.***

22. Refer to the exhibit. Which set of devices contains only intermediary devices?



- **A, B, D, G***
- A, B, E, F
- C, D, G, I
- G, H, I, J

23. Which two statements about the relationship between LANs and WANs are true? (Choose two.)

- Both LANs and WANs connect end devices.
- **WANs connect LANs at slower speed bandwidth than LANs connect their internal end devices.***
- LANs connect multiple WANs together.
- WANs must be publicly-owned, but LANs can be owned by either public or private entities.

- **WANs are typically operated through multiple ISPs, but LANs are typically operated by single organizations or individuals.***
24. **Which two Internet solutions provide an always-on, high-bandwidth connection to computers on a LAN? (Choose two.) Which two Internet solutions provide an always-on, high-bandwidth connection to computers on a LAN? (Choose two.)**
- cellular
 - **DSL***
 - satellite
 - **cable***
 - dial-up telephone
25. **Which description correctly defines a converged network?**
- **a single network channel capable of delivering multiple communication forms***
 - a network that allows users to interact directly with each other over multiple channels
 - a dedicated network with separate channels for video and voice services
 - a network that is limited to exchanging character-based information
26. **Which statement describes a network that supports QoS?**
- The fewest possible devices are affected by a failure.
 - The network should be able to expand to keep up with user demand.
 - **The network provides predictable levels of service to different types of traffic.***
 - Data sent over the network is not altered in transmission.
27. **What is a characteristic of circuit-switched networks?**
- **If all circuits are busy, a new call cannot be placed.***
 - If a circuit fails, the call will be forwarded on a new path.
 - Circuit-switched networks can dynamically learn and use redundant circuits.
 - A single message can be broken into multiple message blocks that are transmitted through multiple circuits simultaneously.
28. **Which expression accurately defines the term congestion?**
- a method of limiting the impact of a hardware or software failure on the network
 - a measure of the data carrying capacity of the network
 - **a state where the demand on the network resources exceeds the available capacity***
 - a set of techniques to manage the utilization of network resources
29. **Which tool provides real-time video and audio communication over the Internet so that businesses can conduct corporate meetings with participants from several remote locations?**
- wiki
 - weblog

- **TelePresence***
- instant messaging

30. **Requiring strong, complex passwords is a practice that supports which network security goal?**

- maintaining communication integrity
- ensuring reliability of access
- **ensuring data confidentiality***
- ensuring redundancy

31. **Which three network tools provide the minimum required security protection for home users? (Choose three.)**

- an intrusion prevention system
- **antivirus software ***
- **antispyware software***
- access control lists
- **a firewall***
- powerline networking

32. **Fill in the blank.**

The acronym **byod *** refers to the trend of end users being able to use their personal devices to access the business network and resources.

33. **Match the form of network communication with its description. (Not all options are used.)**

Question as presented:

Match the description to the form of network communication. (Not all options are used.)

<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">interactive websites where people create and share user-generated content with friends and family</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">web pages that groups of people can edit and view together</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">an audio-based medium that allows people to deliver their recordings to a wide audience</div> <div style="border: 1px solid black; padding: 5px;">real-time communication between two or more people</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px; text-align: center;">podcast</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px; text-align: center;">weblog (blog)</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px; text-align: center;">social media</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px; text-align: center;">wiki</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">instant messaging</div>
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Explain:

Place the options in the following order:

Question as presented:

Match the description to the form of network communication. (Not all options are used.)

interactive websites where people create and share user-generated content with friends and family	podcast
web pages that groups of people can edit and view together	weblog (blog)
an audio-based medium that allows people to deliver their recordings to a wide audience	social media
real-time communication between two or more people	wiki
	instant messaging

an audio-based medium that allows people to deliver their recordings to a wide audience → podcast

– not scored –

interactive websites where people create and share user-generated content with friends and family → social media

web pages that groups of people can edit and view together → wiki

real-time communication between two or more people → instant messaging

34. Which two Internet solutions provide an always-on, high-bandwidth connection to computers on a LAN? (Choose two.)

cellular

DSL*

satellite

cable*

dial-up telephone

35. Match each characteristic to its corresponding internet conectivity type. (Not all options are used)

Question as presented:

Match each characteristic to its corresponding Internet connectivity type. (Not all options are used.)

not suited for heavily wooded areas	DSL
uses coaxial cable as a medium	dialup telephone
typically has very low bandwidth	satellite
high bandwidth connection that runs over telephone line	cable
typically uses a T1/E1 or T3/E3 circuit	

Question as presented:

Match each characteristic to its corresponding Internet connectivity type. (Not all options are used.)

not suited for heavily wooded areas	DSL
uses coaxial cable as a medium	dialup telephone
typically has very low bandwidth	satellite
high bandwidth connection that runs over telephone line	cable
typically uses a T1/E1 or T3/E3 circuit	

Place the options in the following order:

- high bandwidth connection that runs over telephone line
- typically has very low bandwidth
- not suited for heavily wooded areas
- uses coaxial cable as a medium

Explain:

DSL is an always-on, high bandwidth connection that runs over telephone lines. Cable uses the same coaxial cable that carries television signals into the home to provide Internet access. Dialup telephone is much slower than either DSL or cable, but is the least expensive option for home users because it can use any telephone line and a simple modem. Satellite requires a clear line of sight and is affected by trees and other obstructions. None of these typical home options use dedicated leased lines such as T1/E1 and T3/E3.

36. What two criteria are used to help select network media? (Choose two.)

the distance the media can successfully carry a signal*

the environment where the media is to be installed*

the cost of the end devices utilized in the network

the number of intermediary devices installed in the network

the types of data that need to be prioritized

37. What is the Internet?

It is a network based on Ethernet technology.

It provides network access for mobile devices.

It provides connections through interconnected global networks.*

It is a private network for an organization with LAN and WAN connections.

Explain:

The Internet provides global connections that enable networked devices (workstations and mobile devices) with different network technologies, such as Ethernet, DSL/cable, and serial connections, to communicate. A private network for an organization with LAN and WAN connections is an intranet.

38. Match each definition to the corresponding security goal. (Not all options are used.)

Question as presented:

Match the definition to the security goal. (Not all options are used.)

ensuring confidentiality	only made possible by requiring validation of the receiver
maintaining integrity	only the intended recipients can access and read the data
ensuring availability	only encrypted connections (VPNs) are allowed to transfer data
	the assurance that the information has not been altered during transmission
	the assurance of timely and reliable access to data

Question as presented:

Match the definition to the security goal. (Not all options are used.)

ensuring confidentiality	only made possible by requiring validation of the receiver
maintaining integrity	only the intended recipients can access and read the data
ensuring availability	only encrypted connections (VPNs) are allowed to transfer data
	the assurance that the information has not been altered during transmission
	the assurance of timely and reliable access to data

(Note: Red arrows in the original image point from 'ensuring confidentiality' to 'only the intended recipients can access and read the data', from 'maintaining integrity' to 'the assurance that the information has not been altered during transmission', and from 'ensuring availability' to 'the assurance of timely and reliable access to data'.)

ensuring confidentiality -> only the intended recipients can access and read the data

– not scored –

maintaining integrity -> the assurance that the information has not been altered during transmission

ensuring availability -> the assurance of timely and reliable access to data

Explain:

Data integrity verifies that the data has not been altered on the trip between the sender and the receiver. A field calculated by the sender is recalculated and verified to be the same by the receiver. Passwords and authorization maintain control over who has access to personal data. Redundant devices and links attempt to provide 99.999% availability to users. Integrity is made possible by requiring validation of the sender, not the destination. VPNs are not the only secure method by which data can be transferred confidentially.

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1. What is the function of the kernel of an operating software?

- It provides a user interface that allows users to request a specific task.
- The kernel links the hardware drivers with the underlying electronics of a computer.
- It is an application that allows the initial configuration of a Cisco device.
- **The kernel provisions hardware resources to meet software requirements.***

Explain:

Operating systems function with a shell, a kernel, and the hardware. The shell interfaces with the users, allowing them to request specific tasks from the device. The kernel provisions resources from the hardware to meet software requirements. The hardware functions by using drivers and their underlying electronics. The hardware represents the physical components of the device.

2. A network administrator needs to keep the user ID, password, and session contents private when establishing remote CLI connectivity with a switch to manage it. Which access method should be chosen?

- Telnet
- Console
- AUX
- **SSH***

Explain:

To be truly private a technician would use a Console connection however if remote management is required SSH provides a secure method.

3. Which procedure is used to access a Cisco 2960 switch when performing an initial configuration in a secure environment?

- Use Telnet to remotely access the switch through the network.
- **Use the console port to locally access the switch from a serial or USB interface of the PC.***
- Use Secure Shell to remotely access the switch through the network.
- Use the AUX port to locally access the switch from a serial or USB interface of the PC.

Explain:

Telnet and SSH require active networking services to be configured on a Cisco device before they become functional. Cisco switches do not contain AUX ports.

4. Which command or key combination allows a user to return to the previous level in the command

hierarchy?

- end
- **exit***
- Ctrl-Z
- Ctrl-C

Explain:

End and CTRL-Z return the user to the privileged EXEC mode. Ctrl-C ends a command in process. The exit command returns the user to the previous level.

5. **A router has a valid operating system and a configuration file stored in NVRAM. The configuration file contains an enable secret password but no console password. When the router boots up, which mode will display?**

- global configuration mode
- setup mode
- privileged EXEC mode
- **user EXEC mode ***

Explain:

If a Cisco IOS device has a valid IOS and a valid configuration file, it will boot into user EXEC mode. A password will be required to enter privileged EXEC mode.

6. **Which two functions are provided to users by the context-sensitive help feature of the Cisco IOS CLI? (Choose two.)**

- providing an error message when a wrong command is submitted
- **displaying a list of all available commands within the current mode***
- allowing the user to complete the remainder of an abbreviated command with the TAB key
- **determining which option, keyword, or argument is available for the entered command***
- selecting the best command to accomplish a task

Explain:

Context-sensitive help provides the user with a list of commands and the arguments associated with those commands within the current mode of a networking device. A syntax checker provides error checks on submitted commands and the TAB key can be used for command completion if a partial command is entered.

7. **Which information does the show startup-config command display?**

- the IOS image copied into RAM
- the bootstrap program in the ROM
- the contents of the current running configuration file in the RAM
- **the contents of the saved configuration file in the NVRAM ***

Explain:

The show startup-config command displays the saved configuration located in NVRAM. The show running-config command displays the contents of the currently running configuration file located in RAM.

8. **Why is it important to configure a hostname on a device?**

- a Cisco router or switch only begins to operate when its hostname is set
- a hostname must be configured before any other parameters
- **to identify the device during remote access (SSH or telnet)***
- to allow local access to the device through the console port

Explain:

It is important to configure a hostname because various authentication processes use the device hostname. Hostnames are helpful for documentation, and they identify the device during remote access.

9. **Which two host names follow the guidelines for naming conventions on Cisco IOS devices? (Choose two.)**

- Branch2!
- **RM-3-Switch-2A4***
- Floor(15)
- HO Floor 17
- **SwBranch799***

Explain:

Some guidelines for naming conventions are that names should:

Start with a letter

Contain no spaces

End with a letter or digit

Use only letters, digits, and dashes

Be less than 64 characters in length

10. **How does the service password-encryption command enhance password security on Cisco routers and switches?**

- It encrypts passwords as they are sent across the network.
- **It encrypts passwords that are stored in router or switch configuration files.***
- It requires that a user type encrypted passwords to gain console access to a router or switch.
- It requires encrypted passwords to be used when connecting remotely to a router or switch with Telnet.

Explain:

The service password-encryption command encrypts plaintext passwords in the configuration file so that they cannot be viewed by unauthorized users.

11. **Refer to the exhibit. A network administrator is configuring the MOTD on switch SW1. What is the purpose of this command?**

```
SW1# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.

SW1(config)# banner motd # Use of this device is restricted to
authorized members of the Admin group. #
SW1(config)# end
SW1#
```

- **to display a message when a user accesses the switch***
- to configure switch SW1 so that only the users in the Admin group can telnet into SW1
- to force users of the Admin group to enter a password for authentication
- to configure switch SW1 so that the message will display when a user enters the enable command

Explain:

A banner message can be an important part of the legal process in the event that someone is prosecuted for breaking into a device. A banner message should make it clear that only authorized personnel should attempt to access the device. However, the banner command does not prevent unauthorized entry.

12. **While trying to solve a network issue, a technician made multiple changes to the current router configuration file. The changes did not solve the problem and were not saved. What action can the technician take to discard the changes and work with the file in NVRAM?**

- **Issue the reload command without saving the running configuration.***
- Delete the vlan.dat file and reboot the device.
- Close and reopen the terminal emulation software.
- Issue the copy startup-config running-config command.

Explain:

The technician does not want to make any mistakes trying to remove all the changes that were done to the running configuration file. The solution is to reboot the router without saving the running configuration. The copy startup-config running-config command does not overwrite the running configuration file with the configuration file stored in NVRAM, but rather it just has an additive effect.

13. **Which statement is true about the running configuration file in a Cisco IOS device?**

- **It affects the operation of the device immediately when modified.***
- It is stored in NVRAM.
- It should be deleted using the erase running-config command.
- It is automatically saved when the router reboots.

Explain:

As soon as configuration commands are entered into a router, they modify the device immediately. Running configuration files can not be deleted nor are they saved automatically.

14. **What are two characteristics of RAM on a Cisco device? (Choose two.)**

- RAM provides nonvolatile storage.
- **The configuration that is actively running on the device is stored in RAM. ***

- **The contents of RAM are lost during a power cycle. ***
- RAM is a component in Cisco switches but not in Cisco routers.
- RAM is able to store multiple versions of IOS and configuration files.

Explain:

RAM stores data that is used by the device to support network operations. The running configuration is stored in RAM. This type of memory is considered volatile memory because data is lost during a power cycle. Flash memory stores the IOS and delivers a copy of the IOS into RAM when a device is powered on. Flash memory is nonvolatile since it retains stored contents during a loss of power.

15. Which interface allows remote management of a Layer 2 switch?

- the AUX interface
- the console port interface
- **the switch virtual interface***
- the first Ethernet port interface

Explain:

In a Layer 2 switch, there is a switch virtual interface (SVI) that provides a means for remotely managing the device.

16. Which interface is the default SVI on a Cisco switch?

- FastEthernet 0/1
- GigabitEthernet 0/1
- **VLAN 1***
- VLAN 99

Explain:

An SVI is a virtual interface and VLAN 1 is enabled by default on Cisco switches. VLAN 99 must be configured to be used. FastEthernet 0/1 and GigabitEthernet 0/1 are physical interfaces.

17. Why would a Layer 2 switch need an IP address?

- to enable the switch to send broadcast frames to attached PCs
- to enable the switch to function as a default gateway
- **to enable the switch to be managed remotely***
- to enable the switch to receive frames from attached PCs

Explain:

A switch, as a Layer 2 device, does not need an IP address to transmit frames to attached devices. However, when a switch is accessed remotely through the network, it must have a Layer 3 address. The IP address must be applied to a virtual interface rather than to a physical interface. Routers, not switches, function as default gateways.

18. What command can be used on a Windows PC to see the IP configuration of that computer?

- ping
- **ipconfig***

- show interfaces
- show ip interface brief

Explain:

On a Windows PC, the ipconfig command can be used to verify the current IP configuration. The ping command can be used to verify connectivity to other network devices. The show interfaces and show ip interface brief commands are both Cisco IOS commands that are used to see the status of router and switch interfaces.

19. **A technician is adding a new PC to a LAN. After unpacking the components and making all the connections, the technician starts the PC. After the OS loads, the technician opens a browser, and verifies that the PC can reach the Internet. Why was the PC able to connect to the network with no additional configuration?**

- The PC does not require any additional information to function on the network.
- The PC came preconfigured with IP addressing information from the factory.
- **The PC was preconfigured to use DHCP.***
- The PC used DNS to automatically receive IP addressing information from a server.
- The PC virtual interface is compatible with any network.

Explain:

The new PC was preconfigured to use DHCP. When the PC is connected to a network that uses DHCP, it gets the IP address settings from the DHCP server that will allow it to function on the network. All devices require at least an IP address and subnet mask to function on a LAN. DNS does not automatically configure addresses on hosts. PC virtual interfaces are not universally compatible with LANs and do not necessarily provide a host with an IP address. At this place in the course, virtual interfaces are used on network switches.

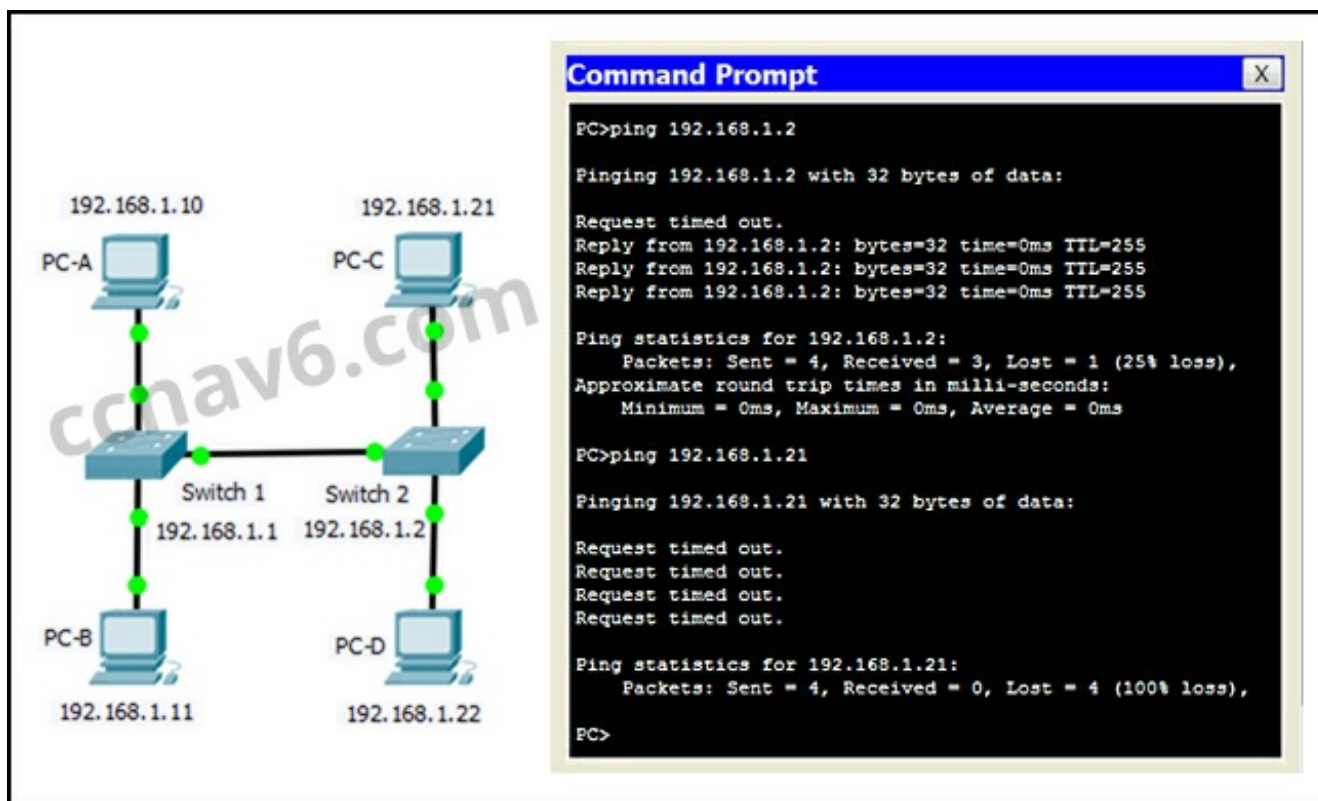
20. **What is a user trying to determine when issuing a ping 10.1.1.1 command on a PC?**

- if the TCP/IP stack is functioning on the PC without putting traffic on the wire
- **if there is connectivity with the destination device***
- the path that traffic will take to reach the destination
- what type of device is at the destination

Explain:

The ping destination command can be used to test connectivity.

21. **Refer to the exhibit. A network technician is testing connectivity in a new network. Based on the test results shown in the exhibit, which device does the technician have connectivity with and which device does the technician not have connectivity with? (Choose two.)**



- **connectivity: switch 2***
- connectivity: PC-D
- connectivity: PC-B
- no connectivity: switch 1
- no connectivity: switch 2
- **no connectivity: PC-C***

Explain:

The exhibit shows ping tests to two devices. One device has the IP address of 192.168.1.2, which is switch 2. The other test is to the IP address of 192.168.1.21, which is host PC-C. For the first test, to switch 2, the results are successful, with four reply messages received. This means that connectivity exists to switch 2. For the second test, all four messages timed out. This indicates that connectivity does not exist to PC-C.

22. **Refer to the exhibit.**

Switch# show ip interface brief					
Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/1	unassigned	YES	manual	up	up
FastEthernet0/2	unassigned	YES	manual	down	down
FastEthernet0/3	unassigned	YES	manual	down	down
FastEthernet0/5	unassigned	YES	manual	down	down
FastEthernet0/6	unassigned	YES	manual	down	down
(output omitted)					
FastEthernet0/23	unassigned	YES	manual	down	down
FastEthernet0/24	unassigned	YES	manual	down	down
Vlan1	192.168.11.3	YES	manual	up	up

Refer to the exhibit. What three facts can be determined from the viewable output of the show ip interface brief command? (Choose three.)

```
Switch# show ip interface brief
Interface      IP-Address      OK?  Method  Status  Protocol
FastEthernet0/1  unassigned      YES   manual   up      up
FastEthernet0/2  unassigned      YES   manual   down    down
FastEthernet0/3  unassigned      YES   manual   down    down
FastEthernet0/5  unassigned      YES   manual   down    down
FastEthernet0/6  unassigned      YES   manual   down    down
(output omitted)
FastEthernet0/23 unassigned      YES   manual   down    down
FastEthernet0/24 unassigned      YES   manual   down    down
Vlan1           192.168.11.3    YES   manual   up      up
up
```

What three facts can be determined from the viewable output of the show ip interface brief command? (Choose three.)

- Two physical interfaces have been configured.
- **The switch can be remotely managed.***
- **One device is attached to a physical interface.***
- Passwords have been configured on the switch.
- Two devices are attached to the switch.
- **The default SVI has been configured.***

Explain:

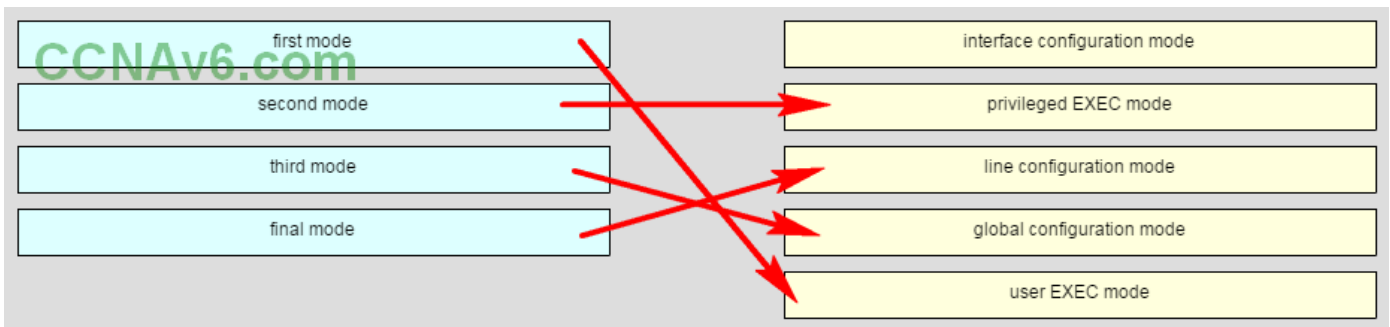
Vlan1 is the default SVI. Because an SVI has been configured, the switch can be configured and managed remotely. FastEthernet0/0 is showing up and up, so a device is connected.

administrator travel through the IOS modes of operation in order to reach the mode in which the configuration commands will be entered? (Not all options are used.)

Question as presented:

An administrator is configuring a switch console port with a password. In what order will the administrator travel through the IOS modes of operation in order to reach the mode in which the configuration commands will be entered? (Not all options are used.)

first mode	interface configuration mode
second mode	privileged EXEC mode
third mode	line configuration mode
final mode	global configuration mode
	user EXEC mode



Place the options in the following order:

– not scored –

second mode

final mode

third mode

first mode

Explain:

The configuration mode that the administrator first encounters is user EXEC mode. After the enable command is entered, the next mode is privileged EXEC mode. From there, the configure terminal command is entered to move to global configuration mode. Finally, the administrator enters the line console 0 command to enter the mode in which the configuration will be entered.

24. Match the definitions to their respective CLI hot keys and shortcuts. (Not all options are used.)

- Question

Question as presented:

Match the definitions to their respective CLI hot keys and shortcuts. (Not all options are used.)

displays the next screen	Tab
scrolls backwards through previously entered commands	space bar
provides context-sensitive help	Up Arrow
completes abbreviated commands and parameters	Ctrl-C
aborts commands such as trace and ping	?
	Ctrl-Shift-6

◦ Answer

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Place the options in the following order:

completes abbreviated commands and parameters
displays the next screen
scrolls backwards through previously entered commands
– not scored –
provides context-sensitive help
aborts commands such as trace and ping

Explain:

The shortcuts with their functions are as follows:

- Tab – Completes the remainder of a partially typed command or keyword
- Space bar – displays the next screen
- ? – provides context-sensitive help
- Up Arrow – Allows user to scroll backward through former commands
- Ctrl-C – cancels any command currently being entered and returns directly to privileged EXEC mode
- Ctrl-Shift-6 – Allows the user to interrupt an IOS process such as ping or traceroute

25. A network administrator is planning an IOS upgrade on several of the head office routers and switches. Which three questions must be answered before continuing with the IOS selection and upgrade? (Choose three.)

- Are the devices on the same LAN?
- Do the devices have enough NVRAM to store the IOS image?
- **What models of routers and switches require upgrades?***
- What ports are installed on the routers and switches?

- **Do the routers and switches have enough RAM and flash memory for the proposed IOS versions? ***
- **What features are required for the devices?***

26. A router has a valid operating system and a configuration stored in NVRAM. When the router boots up, which mode will display?

- global configuration mode
- setup mode
- ROM monitor mode
- **user EXEC mode***

27. Which two characters are allowed as part of the hostname of a Cisco device? (Choose two.)

- **numbers***
- question mark
- space
- tab
- **dash***

28. What is a result of using the service password-encryption command on a Cisco network device?

- The command encrypts the banner message.
- The command encrypts the enable mode password.
- **All passwords in the configuration are not shown in clear text when viewing the configuration.***
- A network administrator who later logs into the device will be required to enter an administrator password in order to gain access to the Cisco device.

29. A new network administrator has been asked to enter a banner message on a Cisco device. What is the fastest way a network administrator could test whether the banner is properly configured?

- Reboot the device.
- Enter CTRL-Z at the privileged mode prompt.
- Exit global configuration mode.
- Power cycle the device.
- **Exit privileged EXEC mode and press Enter.***

30. Passwords can be used to restrict access to all or parts of the Cisco IOS. Select the modes and interfaces that can be protected with passwords. (Choose three.)

- **VTY interface ***
- **console interface***
- Ethernet interface
- boot IOS mode
- **privileged EXEC mode***
- router configuration mode

31. What benefit does DHCP provide to a network?

- Hosts always have the same IP address and are therefore always reachable.
- DHCP allows users to refer to locations by a name rather than an IP address.
- **Hosts can connect to the network and get an IP address without manual configuration.***
- Duplicate addresses cannot occur on a network that issues dynamic addresses using DHCP and has static assignments.

32. What criterion must be followed in the design of an IPv4 addressing scheme for end devices?

- Each IP address must match the address that is assigned to the host by DNS.
- **Each IP address must be unique within the local network.***
- Each IP address needs to be compatible with the MAC address.
- Each local host should be assigned an IP address with a unique network component.

33. Refer to the exhibit. A switch was configured as shown. A ping to the default gateway was issued, but the ping was not successful. Other switches in the same network can ping this gateway. What is a possible reason for this?

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface vlan 1
Switch(config-if)# ip address 192.168.10.2 255.255.255.0
Switch(config-if)# exit
Switch(config)# ip default-gateway 192.168.10.220
Switch(config)# exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console
Switch# ping 192.168.10.220
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.220, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

- The VLAN IP address and the default gateway IP address are not in the same network.
- The local DNS server is not functioning correctly.
- **The no shutdown command was not issued for VLAN 1.***
- The ip default-gateway command has to be issued in the VLAN interface configuration mode.
- The default gateway address must be 192.168.10.1.

34. Match the definitions to their respective CLI hot keys and shortcuts.

Match the definitions to their respective CLI hot keys and shortcuts. (Not all options are used.)

	completes abbreviated commands and parameters
	returns directly to the privileged EXEC mode
	scrolls backwards through previously entered commands
	cancels any command currently being entered and returns directly to privileged EXEC mode
	redispays, on a new line, the command currently being typed
	Ctrl-Shift-6

Tab -> **Completes abbreviated commands and parameters***

Ctrl-R -> **returns directly to the privileged EXEC mode***

Up Arrow -> **scrolls backwards through previously entered commands***

Ctrl-Z -> **cancels any command currently being entered and returns directly to privileged EXEC mode***

Ctrl-C -> **Redisplays, on a new line, the command currently being typed***

35. Which two features are characteristics of flash memory? (Choose two.)

Flash receives a copy of the IOS from RAM when a device is powered on.

Flash provides nonvolatile storage.*

The contents of flash may be overwritten.*

Flash is a component in Cisco switches but not in Cisco routers.

The contents of flash may be lost during a power cycle.

36. Match the description to the common IOS CLI access method.

Match the description to the common IOS CLI access method. (Not all options are used.)

It uses a DVI port on the device.

console port

- It displays startup, debugging, and error messages by default.
- It can be used to restore an out-of-box configuration on a switch or router.

virtual interface

- It allows access through use of Telnet or SSH protocols.
- It requires an active network connection.

AUX port

- It connects through dialup connections.
- It is not supported on Catalyst switch devices.

Console port

It displays startup, debugging, and error messages by default.*

It can be used to restore an out-of-box configuration on a switch or router.*

Virtual interface

It allows access through use of Telnet or SSH protocols.*

It requires an active network connection.*

AUX port

It connects through dialup connections*

It is not supported on Catalyst switch devices*

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1. **What method can be used by two computers to ensure that packets are not dropped because too much data is being sent too quickly?**

- encapsulation
- **flow control***
- access method
- response timeout

Explain:

In order for two computers to be able to communicate effectively, there must be a mechanism that allows both the source and destination to set the timing of the transmission and receipt of data. Flow control allows for this by ensuring that data is not sent too fast for it to be received properly.

2. **What type of communication will send a message to all devices on a local area network?**

- **broadcast***
- multicast
- unicast
- allcast

Explain:Broadcast communication is a one-to-all communication. A unicast communication is a one-to-one communication. Multicast is a one-to-many communication where the message is delivered to a specific group of hosts. Allcast is not a standard term to describe message delivery.

3. **What process is used to place one message inside another message for transfer from the source to the destination?**

- access control
- decoding
- **encapsulation***
- flow control

Explain:Encapsulation is the process of placing one message format into another message format. An example is how a packet is placed in its entirety into the data field as it is encapsulated into a frame.

4. **A web client is sending a request for a webpage to a web server. From the perspective of the client, what is the correct order of the protocol stack that is used to prepare the request for transmission?**

- HTTP, IP, TCP, Ethernet

- **HTTP, TCP, IP, Ethernet***
- Ethernet, TCP, IP, HTTP
- Ethernet, IP, TCP, HTTP

Explain:

1. HTTP governs the way that a web server and client interact.
2. TCP manages individual conversations between web servers and clients.
3. IP is responsible for delivery across the best path to the destination.
4. Ethernet takes the packet from IP and formats it for transmission.

5. Which statement is correct about network protocols?

- Network protocols define the type of hardware that is used and how it is mounted in racks.
- **They define how messages are exchanged between the source and the destination.***
- They all function in the network access layer of TCP/IP.
- They are only required for exchange of messages between devices on remote networks.

Explain:

Network protocols are implemented in hardware, or software, or both. They interact with each other within different layers of a protocol stack. Protocols have nothing to do with the installation of the network equipment. Network protocols are required to exchange information between source and destination devices in both local and remote networks.

6. Which statement is true about the TCP/IP and OSI models?

- **The TCP/IP transport layer and OSI Layer 4 provide similar services and functions.***
- The TCP/IP network access layer has similar functions to the OSI network layer.
- The OSI Layer 7 and the TCP/IP application layer provide identical functions.
- The first three OSI layers describe general services that are also provided by the TCP/IP internet layer.

Explain:

The TCP/IP internet layer provides the same function as the OSI network layer. The transport layer of both the TCP/IP and OSI models provides the same function. The TCP/IP application layer includes the same functions as OSI Layers 5, 6, and 7.

7. What is an advantage of using standards to develop and implement protocols?

- A particular protocol can only be implemented by one manufacturer.
- **Products from different manufacturers can interoperate successfully.***
- Different manufacturers are free to apply different requirements when implementing a protocol.
- Standards provide flexibility for manufacturers to create devices that comply with unique requirements.

Explain:

Standards-based protocols enable products from different manufacturers to interoperate successfully. Standards-based protocols enable many manufacturers to implement that protocol. If different manufacturers implement different requirements within the same protocol, then their products will not be interoperable.

8. What three application layer protocols are part of the TCP/IP protocol suite? (Choose three.)

- ARP
- **DHCP ***
- **DNS ***
- **FTP***
- NAT
- PPP

Explain:

DNS, DHCP, and FTP are all application layer protocols in the TCP/IP protocol suite. ARP and PPP are network access layer protocols, and NAT is an internet layer protocol in the TCP/IP protocol suite.

9. What are proprietary protocols?

- protocols developed by private organizations to operate on any vendor hardware
- protocols that can be freely used by any organization or vendor
- **protocols developed by organizations who have control over their definition and operation***
- a collection of protocols known as the TCP/IP protocol suite

Explain:

Proprietary protocols have their definition and operation controlled by one company or vendor. Some of them can be used by different organizations with permission from the owner. The TCP/IP protocol suite is an open standard, not a proprietary protocol.

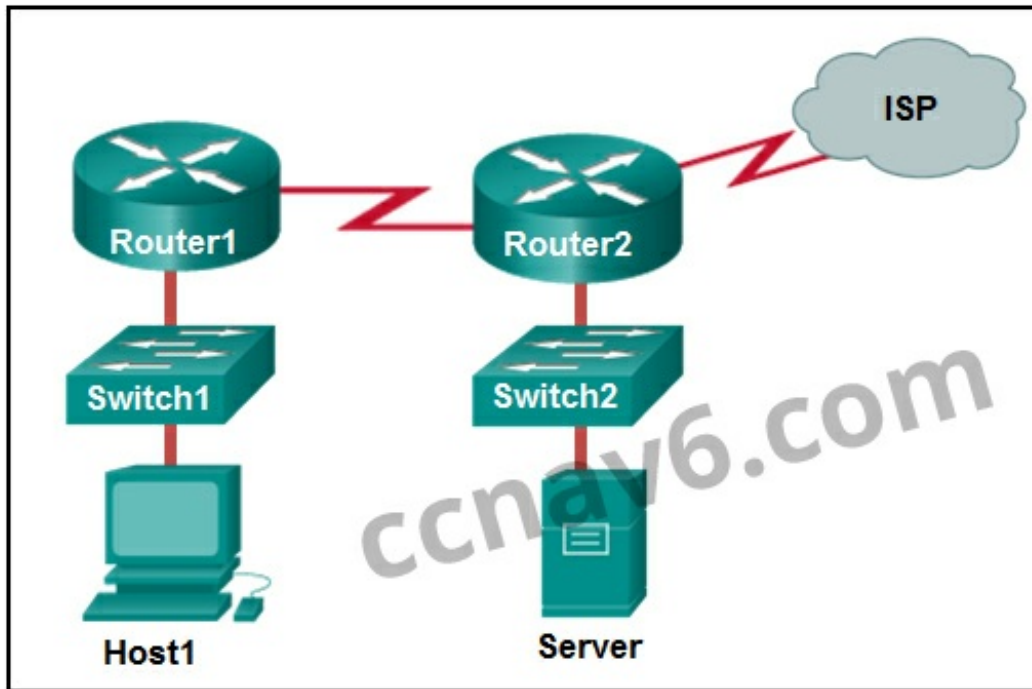
10. What is an advantage of network devices using open standard protocols?

- Network communications is confined to data transfers between devices from the same vendor.
- **A client host and a server running different operating systems can successfully exchange data.***
- Internet access can be controlled by a single ISP in each market.
- Competition and innovation are limited to specific types of products.

Explain:

An advantage of network devices implementing open standard protocols, such as from the TCP/IP suite, is that clients and servers running different operating systems can communicate with each other. Open standard protocols facilitate innovation and competition between vendors and across markets, and can reduce the occurrence of monopolies in networking markets.

11. Refer to the exhibit. If Host1 were to transfer a file to the server, what layers of the TCP/IP model would be used?



- only application and Internet layers
- only Internet and network access layers
- only application, Internet, and network access layers
- **application, transport, Internet, and network access layers***
- only application, transport, network, data link, and physical layers
- application, session, transport, network, data link, and physical layers

Explain:

The TCP/IP model contains the application, transport, internet, and network access layers. A file transfer uses the FTP application layer protocol. The data would move from the application layer through all of the layers of the model and across the network to the file server.

12. Which three layers of the OSI model are comparable in function to the application layer of the TCP/IP model? (Choose three.)

- **application ***
- **presentation ***
- **session***
- transport
- data link
- physical
- network

Explain:

The TCP/IP model consists of four layers: application, transport, internet, and network access. The OSI model consists of seven layers: application, presentation, session, transport, network, data link, and physical. The top three layers of the OSI model: application, presentation, and session map to the application layer of

the TCP/IP model.

13. **At which layer of the OSI model would a logical address be encapsulated?**

- physical layer
- data link layer
- **network layer***
- transport layer

Explain:

Logical addresses, also known as IP addresses, are encapsulated at the network layer. Physical addresses are encapsulated at the data link layer. Port addresses are encapsulated at the transport layer. No addresses are encapsulated at the physical layer.

14. **Which PDU format is used when bits are received from the network medium by the NIC of a host?**

- file
- **frame***
- packet
- segment

Explain:

When received at the physical layer of a host, the bits are formatted into a frame at the data link layer. A packet is the PDU at the network layer. A segment is the PDU at the transport layer. A file is a data structure that may be used at the application layer.

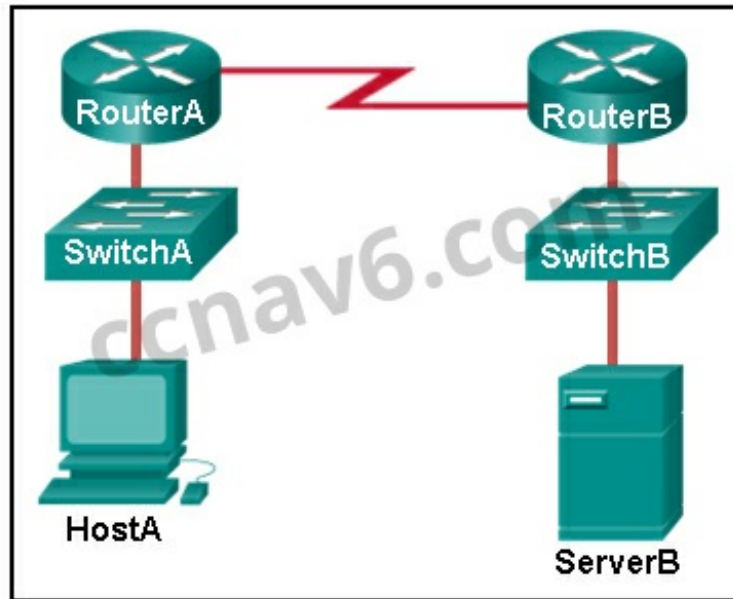
15. **Which PDU is processed when a host computer is de-encapsulating a message at the transport layer of the TCP/IP model?**

- bits
- frame
- packet
- **segment***

Explain:

At the transport layer, a host computer will de-encapsulate a segment to reassemble data to an acceptable format by the application layer protocol of the TCP/IP model.

16. **Refer to the exhibit. HostA is attempting to contact ServerB. Which two statements correctly describe the addressing that HostA will generate in the process? (Choose two.)**



- A packet with the destination IP address of RouterB.
- A frame with the destination MAC address of SwitchA.
- A packet with the destination IP address of RouterA.
- **A frame with the destination MAC address of RouterA. ***
- **A packet with the destination IP address of ServerB.***
- A frame with the destination MAC address of ServerB.

Explain:

In order to send data to ServerB, HostA will generate a packet that contains the IP address of the destination device on the remote network and a frame that contains the MAC address of the default gateway device on the local network.

17. Which address does a NIC use when deciding whether to accept a frame?

- source IP address
- source MAC address
- destination IP address
- **destination MAC address***
- source Ethernet address

18. What will happen if the default gateway address is incorrectly configured on a host?

- The host cannot communicate with other hosts in the local network.
- The switch will not forward packets initiated by the host.
- The host will have to use ARP to determine the correct address of the default gateway.
- **The host cannot communicate with hosts in other networks.***
- A ping from the host to 127.0.0.1 would not be successful.

Explain:

When a host needs to send a message to another host located on the same network, it can forward the message directly. However, when a host needs to send a message to a remote network, it must use the router, also known as the default gateway. This is because the data link frame address of the remote destination host cannot be used directly. Instead, the IP packet has to be sent to the router (default gateway) and the router will forward the packet toward its destination. Therefore, if the default gateway is incorrectly configured, the host can communicate with other hosts on the same network, but not with hosts on remote networks.

19. Which characteristic describes the default gateway of a host computer?

- **the logical address of the router interface on the same network as the host computer***
- the physical address of the switch interface connected to the host computer
- the physical address of the router interface on the same network as the host computer
- the logical address assigned to the switch interface connected to the router

Explain:

The default gateway is the IP address of an interface on the router on the same network as the sending host.

20. A computer in a given network is communicating with a specific group of computers. What type of communication is this?

- broadcast
- **multicast***
- unicast
- ARP
- HTTP

21. Which protocol is responsible for controlling the size and rate of the HTTP messages exchanged between server and client?

- HTTP
- ARP
- **TCP***
- DHCP

22. A user is viewing an HTML document located on a web server. What protocol segments the messages and manages the segments in the individual conversation between the web server and the web client?

- DHCP
- **TCP***
- HTTP
- ARP

23. Which IEEE standard enables a wireless NIC to connect to a wireless AP that is made by a different manufacturer?

- 802.1

- **802.11***
- 802.3
- 802.2

24. What is a function of Layer 4 of the OSI model?

- to specify the packet type to be used by the communications
- to apply framing information to the packet, based on the attached media
- to represent data to the user, including encoding and dialog control
- **to describe the ordered and reliable delivery of data between source and destination***

25. What is a benefit of using a layered model for network communications?

- **fostering competition among device and software vendors by enforcing the compatibility of their products***
- enhancing network transmission performance by defining targets for each layer
- avoiding possible incompatibility issues by using a common set of developing tools
- simplifying protocol development by limiting every layer to one function

26. What is the general term that is used to describe a piece of data at any layer of a networking model?

- frame
- packet
- **protocol data unit***
- segment

27. Which statement accurately describes a TCP/IP encapsulation process when a PC is sending data to the network?

- Data is sent from the internet layer to the network access layer.
- Packets are sent from the network access layer to the transport layer.
- **Segments are sent from the transport layer to the internet layer.***
- Frames are sent from the network access layer to the internet layer.

28. What statement describes the function of the Address Resolution Protocol?

- ARP is used to discover the IP address of any host on a different network.
- ARP is used to discover the IP address of any host on the local network.
- ARP is used to discover the MAC address of any host on a different network.
- **ARP is used to discover the MAC address of any host on the local network.***

29. Which address provides a unique host address for data communications at the internet layer?

- data-link address
- **logical address***
- Layer 2 address

- physical address

30. Which protocol is used by a computer to find the MAC address of the default gateway on an Ethernet network?

- **ARP***
- TCP
- UDP
- DHCP

31. If the default gateway is configured incorrectly on the host, what is the impact on communications?

- The host is unable to communicate on the local network.
- **The host can communicate with other hosts on the local network, but is unable to communicate with hosts on remote networks.***
- The host can communicate with other hosts on remote networks, but is unable to communicate with hosts on the local network.
- There is no impact on communications.

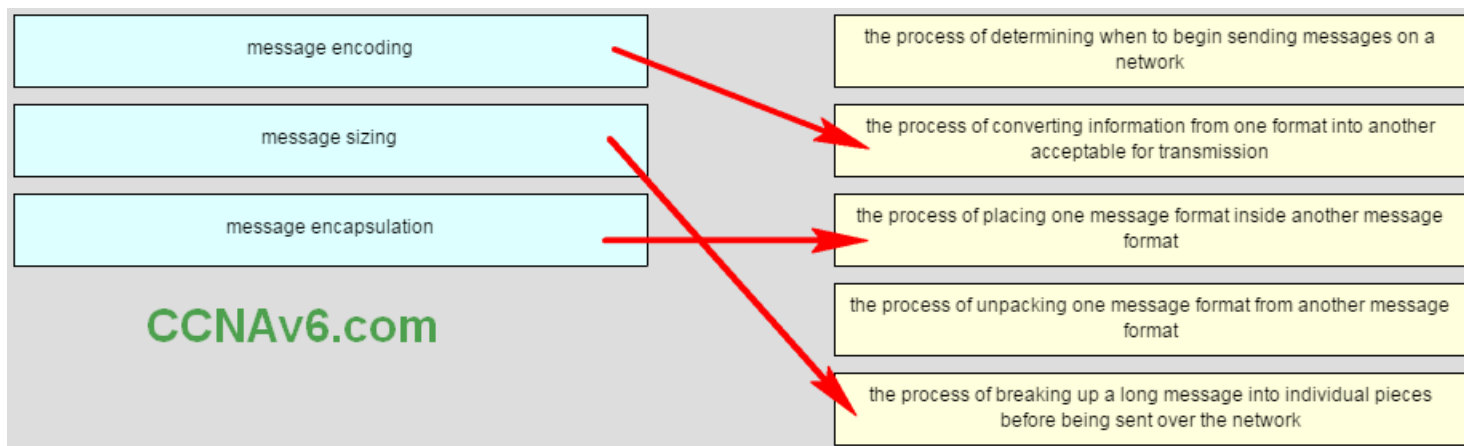
32. Open the PT Activity. Perform the tasks in the activity instructions and then answer the question. Based on the configured network, what IP address would PC1 and PC2 use as their default gateway?

- 192.168.1.2
- 10.1.1.1
- 172.16.1.1
- **192.168.1.1***
- 192.168.1.10

33. Match each description to its corresponding term. (Not all options are used.)

Question as presented:

Match each description to its corresponding term. (Not all options are used.)	
message encoding	the process of determining when to begin sending messages on a network
message sizing	the process of converting information from one format into another acceptable for transmission
message encapsulation	the process of placing one message format inside another message format
	the process of unpacking one message format from another message format
	the process of breaking up a long message into individual pieces before being sent over the network



Place the options in the following order:

– not scored –

message encoding -> the process of converting information from one format into another acceptable for transmission

message encapsulation -> the process of placing one message format inside another message format

– not scored –

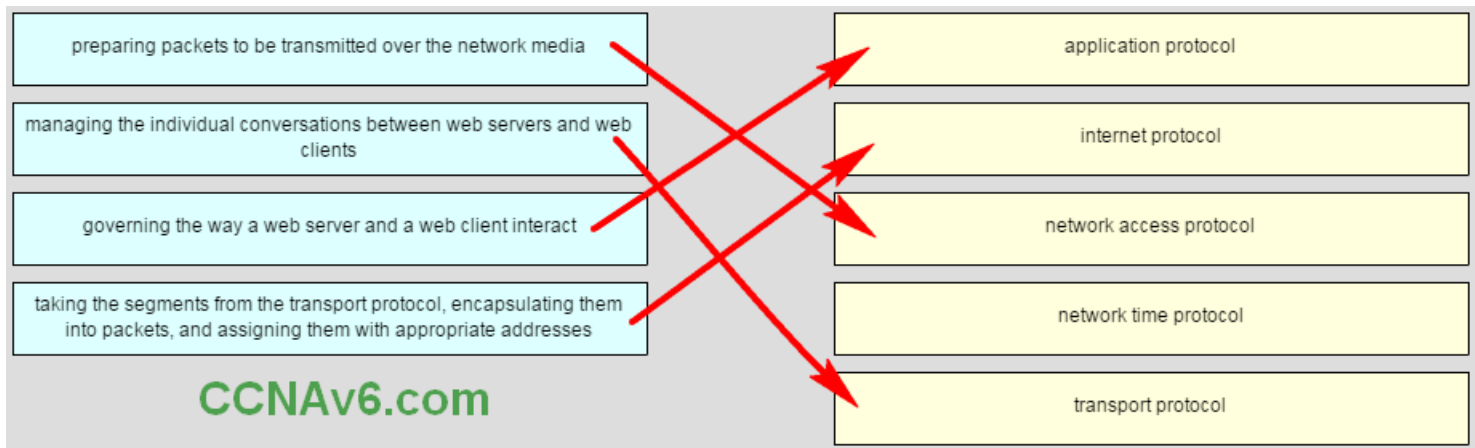
message sizing -> the process of breaking up a long message into individual pieces before being sent over the network

34. Match the protocol function to the description while taking into consideration that a network client is visiting a web site. (Not all options are used.)

Question as presented:

Match the protocol function to the description while taking into consideration that a network client is visiting a web site. (Not all options are used.)

preparing packets to be transmitted over the network media	application protocol
managing the individual conversations between web servers and web clients	internet protocol
governing the way a web server and a web client interact	network access protocol
taking the segments from the transport protocol, encapsulating them into packets, and assigning them with appropriate addresses	network time protocol
	transport protocol



Place the options in the following order:

governing the way a web server and a web client interact → application protocol

taking the segments from transport protocol, encapsulating them into packets, and assigning them with appropriate addresses → internet protocol

preparing packets to be transmitted over the network media → network access protocol

– not scored –

managing the individual conversations between web servers and web clients → transport protocol

Explain:

When a web client visits a web server, several network communication protocols are involved. These different protocols work together to ensure that the messages are received and understood by both parties. These protocols include the following:

Application Protocol – governing the way a web server and a web client interact

Transport Protocol – managing the individual conversations between web servers and web clients

Internet Protocol – taking the formatted segments from the transport protocol, encapsulating them into packets, assigning them the appropriate addresses, and delivering them across the best path to the destination host

Network Access Protocol – preparing packets to be transmitted over the network media

Network Time Protocol is used to synchronize clocks between computer systems. It is not involved in this case.

35. Match the description to the organization. (Not all options are used.)

Question as presented:

Match the description to the organization. (Not all options are used.)

This organization is responsible for overseeing and managing IP address allocation, domain name management, and protocol identifiers.	ISOC
This organization is the largest developer of international standards in the world for a wide variety of products and services. It is known for its Open Systems Interconnection (OSI) reference model.	ISO
This organization promotes the open development, evolution, and use of the Internet throughout the world.	EIA
	IANA

This organization is responsible for overseeing and managing IP address allocation, domain name management, and protocol identifiers.

This organization is the largest developer of international standards in the world for a wide variety of products and services. It is known for its Open Systems Interconnection (OSI) reference model.

This organization promotes the open development, evolution, and use of the Internet throughout the world.

ISOC

ISO

EIA

IANA

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ISOC -> The organization promotes the open development, evolution, and use of the internet throughout the world

ISO -> This organization is the largest developer of international standards in the world for a wide variety of products and services. It is known for its Open System Interconnection (OSI) reference model.

IANA -> This organization is responsible for overseeing and managing IP address allocation, domain name management, and protocol identifiers

Explain:

The EIA is an international standards and trade organization for electronics organizations. It is best known for its standards related to electrical wiring, connectors, and the 19-inch racks used to mount networking equipment.

36. A user sends an HTTP request to a web server on a remote network. During encapsulation for this request, what information is added to the address field of a frame to indicate the destination?

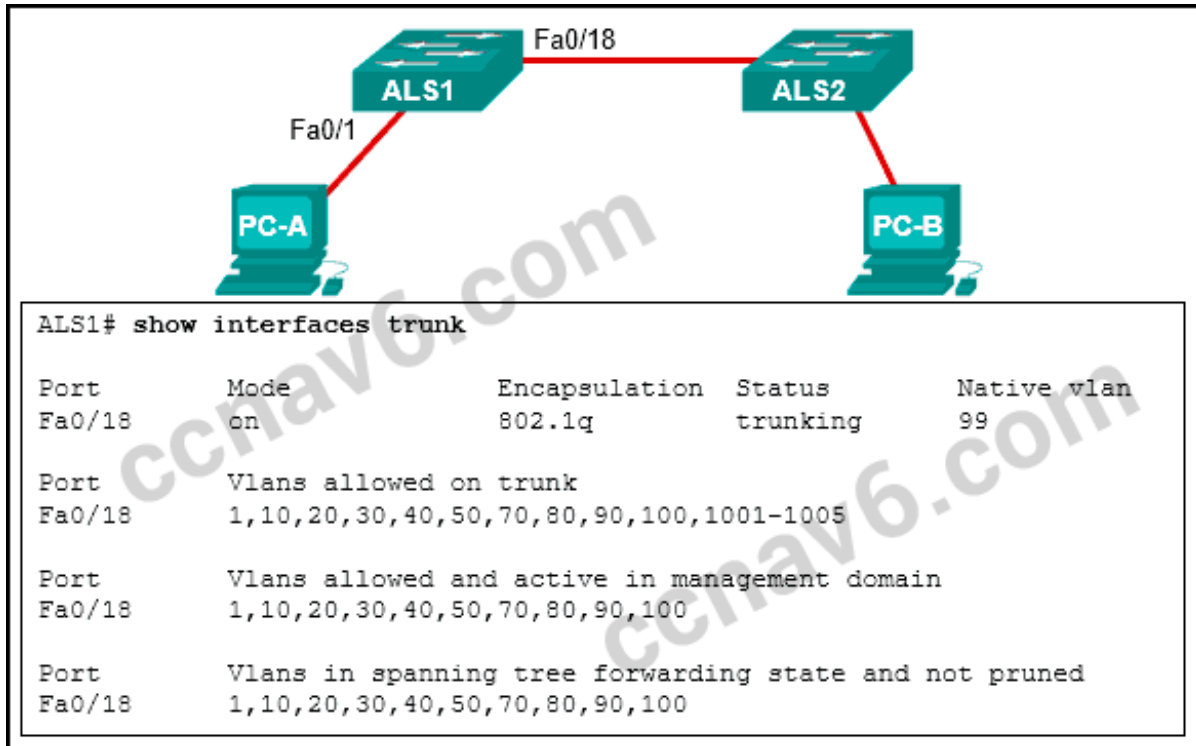
the MAC address of the default gateway*

the IP address of the destination host

the MAC address of the destination host

the IP address of the default gateway

37. Refer to the exhibit. PC-A and PC-B are both in VLAN 60. PC-A is unable to communicate with PC-B. What is the problem?



The native VLAN is being pruned from the link.

The trunk has been configured with the switchport nonegotiate command.

The native VLAN should be VLAN 60.

The VLAN that is used by PC-A is not in the list of allowed VLANs on the trunk.*

38.Which command is used to remove only VLAN 20 from a switch?

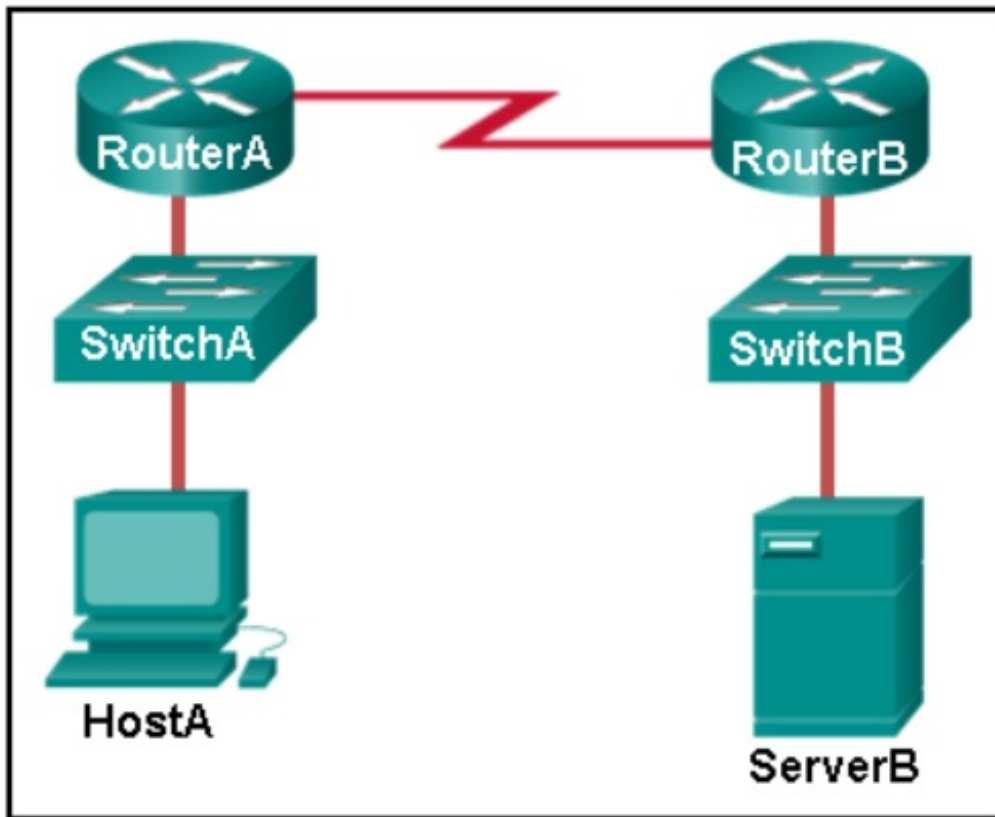
no switchport access vlan 20

no vlan 20 *

delete vlan.dat

delete flash:vlan.dat

39. Refer to the exhibit.



HostA is attempting to contact ServerB. Which two statements correctly describe the addressing that HostA will generate in the process? (Choose two.)

- A packet with the destination IP address of RouterB.
- A frame with the destination MAC address of SwitchA.
- A packet with the destination IP address of RouterA.
- A frame with the destination MAC address of RouterA.***
- A packet with the destination IP address of ServerB.***
- A frame with the destination MAC address of ServerB.

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1. **What are two reasons for physical layer protocols to use frame encoding techniques? (Choose two.)**

- to reduce the number of collisions on the media
- **to distinguish data bits from control bits***
- to provide better media error correction
- **to identify where the frame starts and ends***
- to increase the media throughput

Explain:

An encoding technique converts a stream of data bits in a predefined code that can be recognized by both the transmitter and the receiver. Using predefined patterns helps to differentiate data bits from control bits and provide better media error detection.

2. **What is indicated by the term throughput?**

- the guaranteed data transfer rate offered by an ISP
- the capacity of a particular medium to carry data
- the measure of the usable data transferred across the media
- **the measure of the bits transferred across the media over a given period of time***
- the time it takes for a message to get from sender to receiver

Explain:

Throughput is the measure of the transfer of bits across the media over a given period of time. Throughput is affected by a number of factors such as, EMI and latency, so it rarely matches the specified bandwidth for a network medium. The throughput measurement includes user data bits and other data bits, such as overhead, acknowledging, and encapsulation. The measure of the usable data transferred across the media is called goodput.

3. **A network administrator notices that some newly installed Ethernet cabling is carrying corrupt and distorted data signals. The new cabling was installed in the ceiling close to fluorescent lights and electrical equipment. Which two factors may interfere with the copper cabling and result in signal distortion and data corruption? (Choose two.)**

- **EMI***
- crosstalk
- **RFI***
- signal attenuation

- extended length of cabling

Explain:

EMI and RFI signals can distort and corrupt data signals that are carried by copper media. These distortions usually come from radio waves and electromagnetic devices such as motors and florescent lights. Crosstalk is a disturbance that is caused by adjacent wires bundled too close together with the magnetic field of one wire affecting another. Signal attenuation is caused when an electrical signal begins to deteriorate over the length of a copper cable.

4. Which characteristic describes crosstalk?

- the distortion of the network signal from fluorescent lighting
- **the distortion of the transmitted messages from signals carried in adjacent wires***
- the weakening of the network signal over long cable lengths
- the loss of wireless signal over excessive distance from the access point

Explain:

EMI and RFI can distort network signals because of interference from fluorescent lights or electric motors. Attenuation results in deterioration of the network signal as it travels along copper cabling. Wireless devices can experience loss of signals because of excessive distances from a access point, but this is not crosstalk. Crosstalk is the disturbance caused by the electric or magnetic fields of the signal carried on an adjacent wire within the same cable.

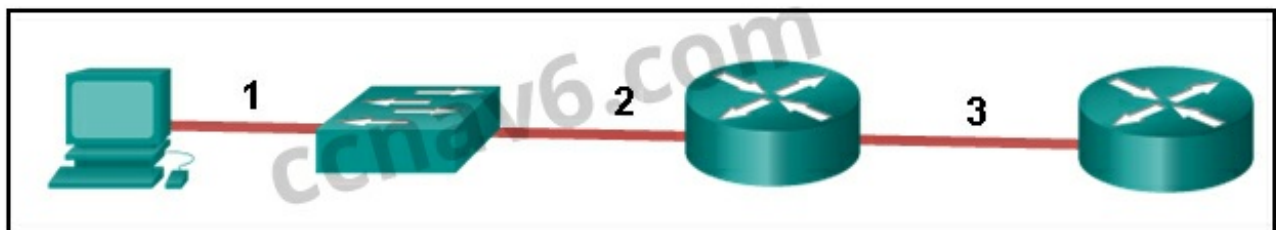
5. What technique is used with UTP cable to help protect against signal interference from crosstalk?

- **twisting the wires together into pairs***
- wrapping a foil shield around the wire pairs
- encasing the cables within a flexible plastic sheath
- terminating the cable with special grounded connectors

Explain:

To help prevent the effects of crosstalk, UTP cable wires are twisted together into pairs. Twisting the wires together causes the magnetic fields of each wire to cancel each other out.

6. Refer to the exhibit. The PC is connected to the console port of the switch. All the other connections are made through FastEthernet links. Which types of UTP cables can be used to connect the devices?



- 1 – rollover, 2 – crossover, 3 – straight-through
- **1 – rollover, 2 – straight-through, 3 – crossover***
- 1 – crossover, 2 – straight-through, 3 – rollover
- 1 – crossover, 2 – rollover, 3 – straight-through

Explain:

A straight-through cable is commonly used to interconnect a host to a switch and a switch to a router. A crossover cable is used to interconnect similar devices together like switch to a switch, a host to a host, or a router to a router. If a switch has the MDIX capability, a crossover could be used to connect the switch to the router; however, that option is not available. A rollover cable is used to connect to a router or switch console port.

7. Refer to the exhibit. What is wrong with the displayed termination?

- The woven copper braid should not have been removed.
- The wrong type of connector is being used.
- **The untwisted length of each wire is too long.***
- The wires are too thick for the connector that is used.

**Explain:**

When a cable to an RJ-45 connector is terminated, it is important to ensure that the untwisted wires are not too long and that the flexible plastic sheath surrounding the wires is crimped down and not the bare wires. None of the colored wires should be visible from the bottom of the jack.

8. Which type of connector does a network interface card use?

- DIN
- PS-2
- RJ-11
- **RJ-45***

9. What is one advantage of using fiber optic cabling rather than copper cabling?

- It is usually cheaper than copper cabling.
- It is able to be installed around sharp bends.
- It is easier to terminate and install than copper cabling.
- **It is able to carry signals much farther than copper cabling.***

Explain:

Copper cabling is usually cheaper and easier to install than fiber optic cabling. However, fiber cables generally have a much greater signaling range than copper.

10. Why are two strands of fiber used for a single fiber optic connection?

- The two strands allow the data to travel for longer distances without degrading.
- They prevent crosstalk from causing interference on the connection.
- They increase the speed at which the data can travel.

- **They allow for full-duplex connectivity.***

Explain:

Light can only travel in one direction down a single strand of fiber. In order to allow for full-duplex communication two strands of fiber must be connected between each device.

11. **A network administrator is designing the layout of a new wireless network. Which three areas of concern should be accounted for when building a wireless network? (Choose three.)**

- mobility options
- **security ***
- **interference ***
- **coverage area***
- extensive cabling
- packet collision

Explain:

The three areas of concern for wireless networks focus on the size of the coverage area, any nearby interference, and providing network security. Extensive cabling is not a concern for wireless networks, as a wireless network will require minimal cabling for providing wireless access to hosts. Mobility options are not a component of the areas of concern for wireless networks.

12. **Which layer of the OSI model is responsible for specifying the encapsulation method used for specific types of media?**

- application
- transport
- **data link***
- physical

Explain:

Encapsulation is a function of the data link layer. Different media types require different data link layer encapsulation.

13. **What are two services performed by the data link layer of the OSI model? (Choose two.)**

- It encrypts data packets.
- It determines the path to forward packets.
- **It accepts Layer 3 packets and encapsulates them into frames. ***
- **It provides media access control and performs error detection.***
- It monitors the Layer 2 communication by building a MAC address table.

Explain:

The data link layer is responsible for the exchange of frames between nodes over a physical network media. Specifically the data link layer performs two basic services:

It accepts Layer 3 packets and encapsulates them into frames.

It provides media access control and performs error detection.

Path determination is a service provided at Layer 3. A Layer 2 switch builds a MAC address table as part of

its operation, but path determination is not the service that is provided by the data link layer.

14. **What is true concerning physical and logical topologies?**

- The logical topology is always the same as the physical topology.
- Physical topologies are concerned with how a network transfers frames.
- Physical topologies display the IP addressing scheme of each network.
- **Logical topologies refer to how a network transfers data between devices.***

Explain:

Physical topologies show the physical interconnection of devices. Logical topologies show the way the network will transfer data between connected nodes.

15. **Which method of data transfer allows information to be sent and received at the same time?**

- **full duplex***
- half duplex
- multiplex
- simplex

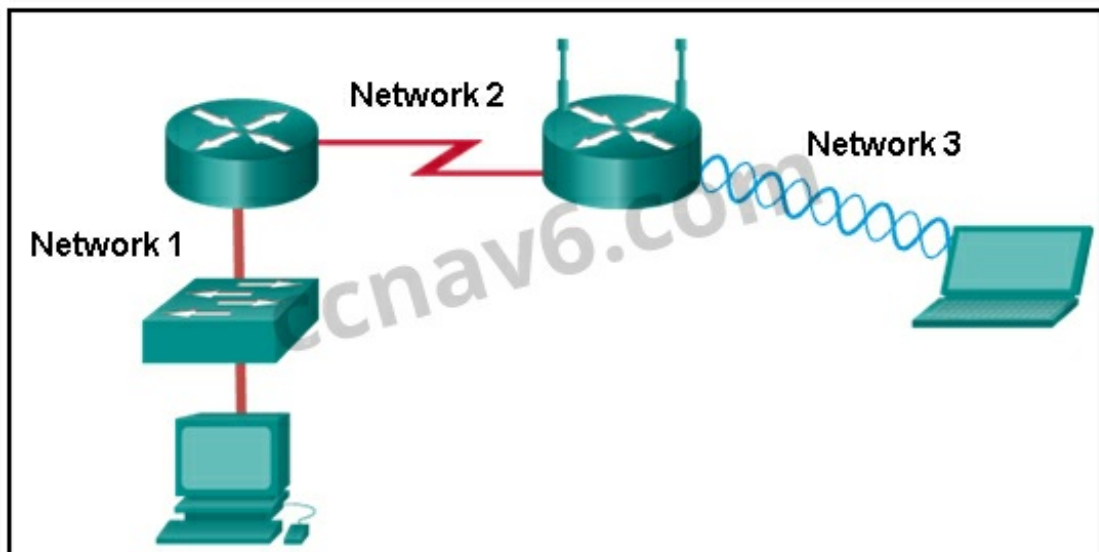
16. **Which statement describes an extended star topology?**

- **End devices connect to a central intermediate device, which in turn connects to other central intermediate devices.***
- End devices are connected together by a bus and each bus connects to a central intermediate device.
- Each end system is connected to its respective neighbor via an intermediate device.
- All end and intermediate devices are connected in a chain to each other.

Explain:

In an extended star topology, central intermediate devices interconnect other star topologies.

17. **Refer to the exhibit. Which statement describes the media access control methods that are used by the networks in the exhibit?**



- All three networks use CSMA/CA
- None of the networks require media access control.
- **Network 1 uses CSMA/CD and Network 3 uses CSMA/CA.***
- Network 1 uses CSMA/CA and Network 2 uses CSMA/CD.
- Network 2 uses CSMA/CA and Network 3 uses CSMA/CD.

Explain:

Network 1 represents an Ethernet LAN. Data on the wired LAN accesses the media using CSMA/CD.

Network 2 represents a point-to-point WAN connection so no media access method is required. Network 3 represents a WLAN and data accesses the network using CSMA/CA.

18. What is contained in the trailer of a data-link frame?

- logical address
- physical address
- data
- **error detection***

Explain:

The trailer in a data-link frame contains error detection information that is pertinent to the frame included in the FCS field. The header contains control information, such as the addressing, while the area that is indicated by the word “data” includes the data, transport layer PDU, and the IP header.

19. As data travels on the media in a stream of 1s and 0s how does a receiving node identify the beginning and end of a frame?

- **The transmitting node inserts start and stop bits into the frame.***
- The transmitting node sends a beacon to notify that a data frame is attached.
- The receiving node identifies the beginning of a frame by seeing a physical address.
- The transmitting node sends an out-of-band signal to the receiver about the beginning of the frame.

Explain:

When data travels on the media, it is converted into a stream of 1s and 0s. The framing process inserts into the frame start and stop indicator flags so that the destination can detect the beginning and end of the frame.

20. What is the function of the CRC value that is found in the FCS field of a frame?

- **to verify the integrity of the received frame***
- to verify the physical address in the frame
- to verify the logical address in the frame
- to compute the checksum header for the data field in the frame

Explain:

The CRC value in the FCS field of the received frame is compared to the computed CRC value of that frame, in order to verify the integrity of the frame. If the two values do not match, then the frame is discarded.

21. Fill in the blank.

The term bandwidth indicates the capacity of a medium to carry data and it is typically measured in

kilobits per second (kb/s) or megabits per second (Mb/s).

Explain:

Bandwidth is the capacity of a medium to carry data in a given amount of time. It is typically measured in kilobits per second (kb/s) or megabits per second (Mb/s).

22. Fill in the blank.

What acronym is used to reference the data link sublayer that identifies the network layer protocol encapsulated in the frame? LLC

Explain:

Logical Link Control (LLC) is the data link sublayer that defines the software processes that provide services to the network layer protocols. LLC places information in the frame and that information identifies the network layer protocol that is encapsulated in the frame.

23. Which statement describes signaling at the physical layer?

- **Sending the signals asynchronously means that they are transmitted without a clock signal.***
- In signaling, a 1 always represents voltage and a 0 always represents the absence of voltage.
- Wireless encoding includes sending a series of clicks to delimit the frames.
- Signaling is a method of converting a stream of data into a predefined code

24. The throughput of a FastEthernet network is 80 Mb/s. The traffic overhead for establishing sessions, acknowledgments, and encapsulation is 15 Mb/s for the same time period. What is the goodput for this network?

- 15 Mb/s
- 95 Mb/s
- 55 Mb/s
- **65 Mb/s***
- 80 Mb/s

25. How is the magnetic field cancellation effect enhanced in UTP cables?

- by increasing the thickness of the PVC sheath that encases all the wires
- **by increasing and varying the number of twists in each wire pair***
- by increasing the thickness of the copper wires
- by decreasing the number of wires that are used to carry data

26. Which statement is correct about multimode fiber?

- Multimode fiber cables carry signals from multiple connected sending devices.
- Multimode fiber commonly uses a laser as a light source.
- **SC-SC patch cords are used with multimode fiber cables.***
- Multimode fiber has a thinner core than single-mode fiber..

27. A network administrator is required to upgrade wireless access to end users in a building. To provide data rates up to 1.3 Gb/s and still be backward compatible with older devices, which wireless standard

should be implemented?

- 802.11n
- **802.11ac***
- 802.11g
- 802.11b

29. What is one main characteristic of the data link layer?

- It generates the electrical or optical signals that represent the 1 and 0 on the media.
- It converts a stream of data bits into a predefined code.
- **It shields the upper layer protocol from being aware of the physical medium to be used in the communication.***
- It accepts Layer 3 packets and decides the path by which to forward a frame to a host on a remote network.

30. What are two characteristics of 802.11 wireless networks? (Choose two.)

- **They use CSMA/CA technology.***
- They use CSMA/CD technology.
- They are collision-free networks.
- Stations can transmit at any time.
- **Collisions can exist in the networks.***

31. What is the purpose of the FCS field in a frame?

- to obtain the MAC address of the sending node
- to verify the logical address of the sending node
- to compute the CRC header for the data field
- **to determine if errors occurred in the transmission and reception***

32. Fill in the blank with a number.

10,000,000,000 b/s can also be written as **10** Gb/s.

33. Fill in the blank.

A physical topology that is a variation or combination of a point-to-point, hub and spoke, or mesh topology is commonly known as a hybrid topology.

Explain:

A hybrid topology is a variation or combination of a point-to-point, hub and spoke, or mesh topology. This may include a partial mesh or extended star topology.

34. Match the steps to the physical layer operations that occur when data is sent from one node and received at another node.

Match the steps to the physical layer operations that occur when data is sent from one node and received at another node. (Not all options are used.)

Step	Operation
Step 1	The physical layer encodes the frames.
Step 2	The physical layer passes the packets up to the internet layer.
Step 3	The physical layer creates the signals that represent the bits in each frame.
Step 4	The physical layer restores the individual signals to their bit representations.
Step 5	The signals are sent on the media one at a time.
	The physical layer retrieves the individual signals from the media.

Match the steps to the physical layer operations that occur when data is sent from one node and received at another node. (Not all options are used.)

Step	Operation
Step 1	The physical layer passes the packets up to the internet layer.
Step 2	
Step 5	
Step 3	
Step 4	

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Sort elements

The physical layer encodes the frames -> Step 1*

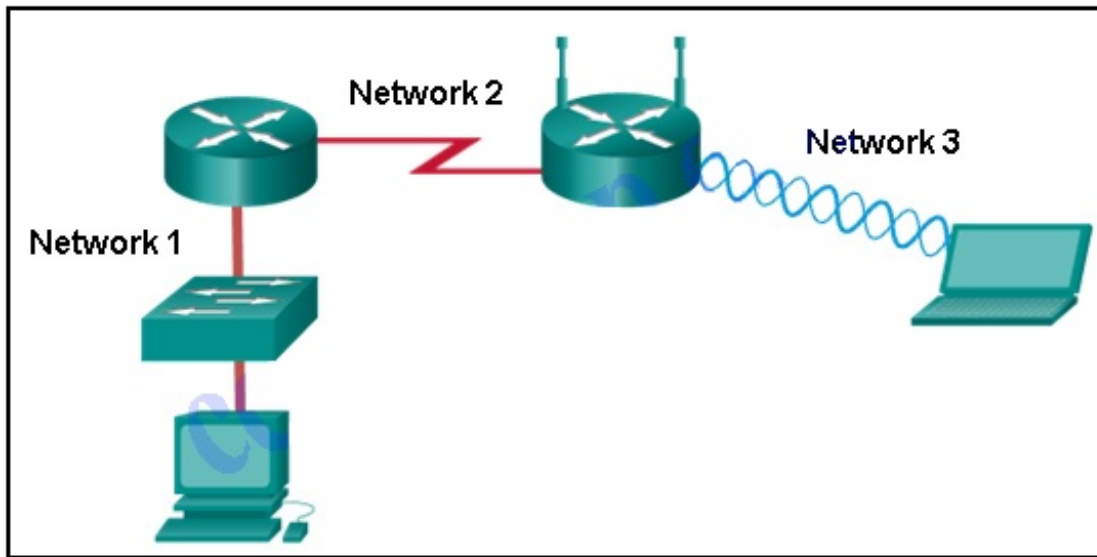
The physical layer creates the signals that represent the bits in each frame -> Step 2*

The signals are sent on the media one at a time. -> Step 3

The physical layer retrieves the individual signals from the media -> Step 4

The physical layer restores the individual signals to their bit representations -> Step 5*

35. Refer to the exhibit.



Which statement describes the media access control methods that are used by the networks in the exhibit?

All three networks use CSMA/CA

None of the networks require media access control.

Network 1 uses CSMA/CD and Network 3 uses CSMA/CA.**

Network 1 uses CSMA/CA and Network 2 uses CSMA/CD.

Network 2 uses CSMA/CA and Network 3 uses CSMA/CD.

36. Match the characteristics to the correct type of fiber. (Not all options are used.)

Question as presented:

Match the characteristics to the correct type of fiber. (Not all options are used.)	
laser as light source	Multimode Fiber
generally used with LANs	Target
only one ray of light into the fiber	Target
several paths of light into the fiber	Target
generally used for campus backbone	Single-mode Fiber
LED as light source	Target
supports full-duplex operation	Target
	Target

Question as presented:

Match the characteristics to the correct type of fiber. (Not all options are used.)

Characteristics	Multimode Fiber	Single-mode Fiber
laser as light source	Target	Target
generally used with LANs	Target	Target
only one ray of light into the fiber	Target	Target
several paths of light into the fiber	Target	Target
generally used for campus backbone	Target	Target
LED as light source	Target	Target
supports full-duplex operation	Target	Target

Place de options in the following order.

Multimode Fiber

LED as light source*

several paths of light into the fiber*

generally used with LANs*

Single-mode Fiber

only one ray of light into the fiber*

generally used for campus backbone*

laser as light source*

Explain:

Single-mode fiber uses a laser as the light source. Its small core produces a single straight path for light and it is commonly used with campus backbones. Multimode fiber uses LEDs as the light source. Its larger core allows for multiple paths for the light. It is commonly used with LANs.

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1. What happens to runt frames received by a Cisco Ethernet switch?

- **The frame is dropped.***
- The frame is returned to the originating network device.
- The frame is broadcast to all other devices on the same network.
- The frame is sent to the default gateway.

Explain:

In an attempt to conserve bandwidth and not forward useless frames, Ethernet devices drop frames that are considered to be runt (less than 64 bytes) or jumbo (greater than 1500 bytes) frames.

2. What are the two sizes (minimum and maximum) of an Ethernet frame? (Choose two.)

- 56 bytes
- **64 bytes***
- 128 bytes
- 1024 bytes
- **1518 bytes***

Explain:

The minimum Ethernet frame is 64 bytes. The maximum Ethernet frame is 1518 bytes. A network technician must know the minimum and maximum frame size in order to recognize runt and jumbo frames.

3. What statement describes Ethernet?

- **It defines the most common LAN type in the world.***
- It is the required Layer 1 and 2 standard for Internet communication.
- It defines a standard model used to describe how networking works.
- It connects multiple sites such as routers located in different countries.

Explain:

Ethernet is the most common LAN protocol in the world. It operates at Layer 1 and 2, but is not required for Internet communication. The OSI model is used to describe how networks operate. A WAN connects multiple sites located in different countries.

4. Which two statements describe features or functions of the logical link control sublayer in Ethernet standards? (Choose two.)

- **Logical link control is implemented in software.***

- Logical link control is specified in the IEEE 802.3 standard.
- The LLC sublayer adds a header and a trailer to the data.
- **The data link layer uses LLC to communicate with the upper layers of the protocol suite.***
- The LLC sublayer is responsible for the placement and retrieval of frames on and off the media.

Explain:

Logical link control is implemented in software and enables the data link layer to communicate with the upper layers of the protocol suite. Logical link control is specified in the IEEE 802.2 standard. IEEE 802.3 is a suite of standards that define the different Ethernet types. The MAC (Media Access Control) sublayer is responsible for the placement and retrieval of frames on and off the media. The MAC sublayer is also responsible for adding a header and a trailer to the network layer protocol data unit (PDU).

5. What statement describes a characteristic of MAC addresses?

- **They must be globally unique.***
- They are only routable within the private network.
- They are added as part of a Layer 3 PDU.
- They have a 32-bit binary value.

Explain:

Any vendor selling Ethernet devices must register with the IEEE to ensure the vendor is assigned a unique 24-bit code, which becomes the first 24 bits of the MAC address. The last 24 bits of the MAC address are generated per hardware device. This helps to ensure globally unique addresses for each Ethernet device.

6. Which statement is true about MAC addresses?

- MAC addresses are implemented by software.
- A NIC only needs a MAC address if connected to a WAN.
- **The first three bytes are used by the vendor assigned OUI.***
- The ISO is responsible for MAC addresses regulations.

Explain:

A MAC address is composed of 6 bytes. The first 3 bytes are used for vendor identification and the last 3 bytes must be assigned a unique value within the same OUI. MAC addresses are implemented in hardware. A NIC needs a MAC address to communicate over the LAN. The IEEE regulates the MAC addresses.

7. Which destination address is used in an ARP request frame?

- 0.0.0.0
- 255.255.255.255
- **FFFF.FFFF.FFFF***
- 127.0.0.1
- 01-00-5E-00-AA-23

Explain:

The purpose of an ARP request is to find the MAC address of the destination host on an Ethernet LAN. The ARP process sends a Layer 2 broadcast to all devices on the Ethernet LAN. The frame contains the IP address of the destination and the broadcast MAC address, FFFF.FFFF.FFFF.

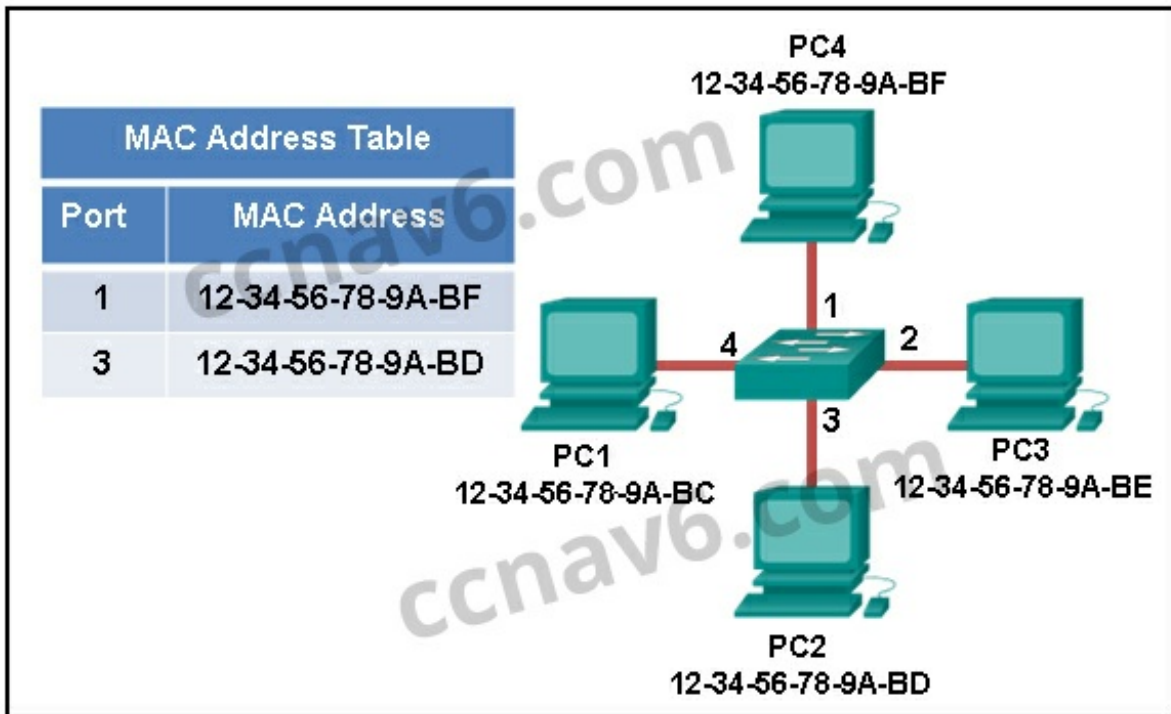
8. What addressing information is recorded by a switch to build its MAC address table?

- the destination Layer 3 address of incoming packets
- the destination Layer 2 address of outgoing frames
- the source Layer 3 address of outgoing packets
- **the source Layer 2 address of incoming frames***

Explain:

A switch builds a MAC address table by inspecting incoming Layer 2 frames and recording the source MAC address found in the frame header. The discovered and recorded MAC address is then associated with the port used to receive the frame.

9. Refer to the exhibit. The exhibit shows a small switched network and the contents of the MAC address table of the switch. PC1 has sent a frame addressed to PC3. What will the switch do with the frame?



- The switch will discard the frame.
- The switch will forward the frame only to port 2.
- **The switch will forward the frame to all ports except port 4.***
- The switch will forward the frame to all ports.
- The switch will forward the frame only to ports 1 and 3.

Explain:

The MAC address of PC3 is not present in the MAC table of the switch. Because the switch does not know where to send the frame that is addressed to PC3, it will forward the frame to all the switch ports, except for port 4, which is the incoming port.

10. Which switching method uses the CRC value in a frame?

- cut-through
- fast-forward
- fragment-free
- **store-and-forward***

Explain:

When the store-and-forward switching method is used, the switch receives the complete frame before forwarding it on to the destination. The cyclic redundancy check (CRC) part of the trailer is used to determine if the frame has been modified during transit. In contrast, a cut-through switch forwards the frame once the destination Layer 2 address is read. Two types of cut-through switching methods are fast-forward and fragment-free.

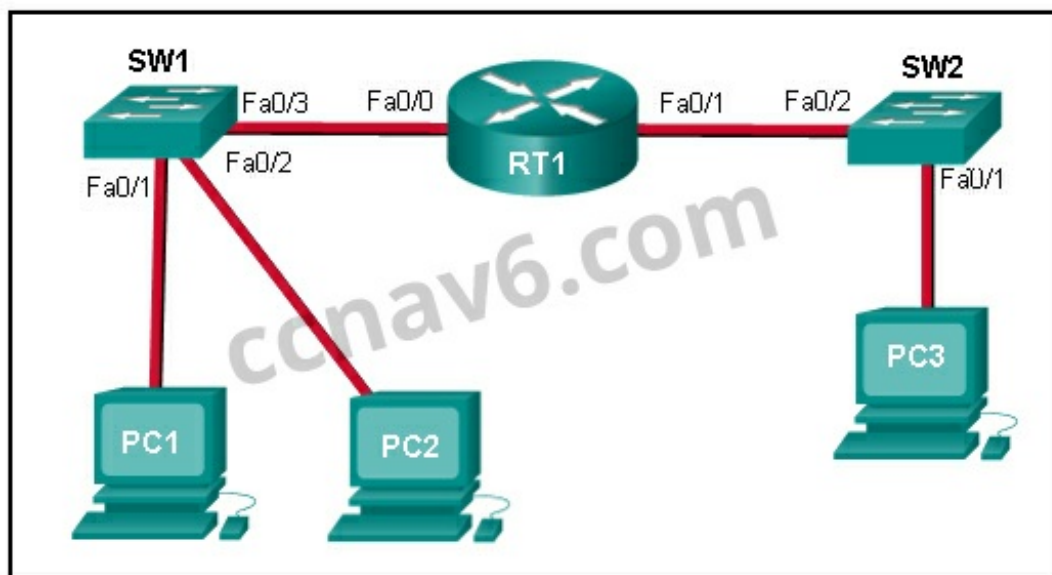
11. What is auto-MDIX?

- a type of Cisco switch
- an Ethernet connector type
- a type of port on a Cisco switch
- **a feature that detects Ethernet cable type***

Explain:

Auto-MDIX is a feature that is enabled on the latest Cisco switches and that allows the switch to detect and use whatever type of cable is attached to a specific port.

12. Refer to the exhibit. PC1 issues an ARP request because it needs to send a packet to PC2. In this scenario, what will happen next?



- **PC2 will send an ARP reply with its MAC address.***
- RT1 will send an ARP reply with its Fa0/0 MAC address.
- RT1 will send an ARP reply with the PC2 MAC address.
- SW1 will send an ARP reply with the PC2 MAC address.
- SW1 will send an ARP reply with its Fa0/1 MAC address.

Explain:

When a network device wants to communicate with another device on the same network, it sends a broadcast ARP request. In this case, the request will contain the IP address of PC2. The destination device (PC2) sends an ARP reply with its MAC address.

13. What are two potential network problems that can result from ARP operation? (Choose two.)

- Manually configuring static ARP associations could facilitate ARP poisoning or MAC address spoofing.
- **On large networks with low bandwidth, multiple ARP broadcasts could cause data communication delays. ***
- **Network attackers could manipulate MAC address and IP address mappings in ARP messages with the intent of intercepting network traffic.***
- Large numbers of ARP request broadcasts could cause the host MAC address table to overflow and prevent the host from communicating on the network.
- Multiple ARP replies result in the switch MAC address table containing entries that match the MAC addresses of hosts that are connected to the relevant switch port.

Explain:

Large numbers of ARP broadcast messages could cause momentary data communications delays. Network attackers could manipulate MAC address and IP address mappings in ARP messages with the intent to intercept network traffic. ARP requests and replies cause entries to be made into the ARP table, not the MAC address table. ARP table overflows are very unlikely. Manually configuring static ARP associations is a way to prevent, not facilitate, ARP poisoning and MAC address spoofing. Multiple ARP replies resulting in the switch MAC address table containing entries that match the MAC addresses of connected nodes and are associated with the relevant switch port are required for normal switch frame forwarding operations. It is not an ARP caused network problem.

14. Fill in the blank.

A collision fragment, also known as a **RUNT** frame, is a frame of fewer than 64 bytes in length.

Explain:

A runt frame is a frame of fewer than 64 bytes, usually generated by a collision or a network interface failure.

15. Fill in the blank.

On a Cisco switch, **port-based** memory buffering is used to buffer frames in queues linked to specific incoming and outgoing ports.

16. Fill in the blank.

ARP **spoofing** is a technique that is used to send fake ARP messages to other hosts in the LAN. The aim is to associate IP addresses to the wrong MAC addresses.

Explain:

ARP spoofing or ARP poisoning is a technique used by an attacker to reply to an ARP request for an IPv4 address belonging to another device, such as the default gateway.

17. What is a characteristic of a contention-based access method?

- It processes more overhead than the controlled access methods do.
- It has mechanisms to track the turns to access the media.
- **It is a nondeterministic method.***

- It scales very well under heavy media use.

18. What is the purpose of the preamble in an Ethernet frame?

- is used as a padding for data
- **is used for timing synchronization***
- is used to identify the source address
- is used to identify the destination address

19. What is the Layer 2 multicast MAC address that corresponds to the Layer 3 IPv4 multicast address 224.139.34.56?

- 00-00-00-0B-22-38
- **01-00-5E-0B-22-38***
- 01-5E-00-0B-22-38
- FE-80-00-0B-22-38
- FF-FF-FF-0B-22-38

20. Which two statements are correct about MAC and IP addresses during data transmission if NAT is not involved? (Choose two.)

- A packet that has crossed four routers has changed the destination IP address four times.
- Destination MAC addresses will never change in a frame that goes across seven routers.
- **Destination and source MAC addresses have local significance and change every time a frame goes from one LAN to another. ***
- **Destination IP addresses in a packet header remain constant along the entire path to a target host.***
- Every time a frame is encapsulated with a new destination MAC address, a new destination IP address is needed.

21. What are two features of ARP? (Choose two.)

- **If a host is ready to send a packet to a local destination device and it has the IP address but not the MAC address of the destination, it generates an ARP broadcast.***
- An ARP request is sent to all devices on the Ethernet LAN and contains the IP address of the destination host and its multicast MAC address.
- When a host is encapsulating a packet into a frame, it refers to the MAC address table to determine the mapping of IP addresses to MAC addresses.
- If no device responds to the ARP request, then the originating node will broadcast the data packet to all devices on the network segment.
- **If a device receiving an ARP request has the destination IPv4 address, it responds with an ARP reply.***

22. A host is trying to send a packet to a device on a remote LAN segment, but there are currently no mappings in its ARP cache. How will the device obtain a destination MAC address?

- It will send an ARP request for the MAC address of the destination device.
- **It will send an ARP request for the MAC address of the default gateway. ***

- **It will send the frame and use its own MAC address as the destination. ***
- It will send the frame with a broadcast MAC address.
- It will send a request to the DNS server for the destination MAC address.

23. A network administrator is connecting two modern switches using a straight-through cable. The switches are new and have never been configured. Which three statements are correct about the final result of the connection? (Choose three.)

- **The link between the switches will work at the fastest speed that is supported by both switches. ***
- **The link between switches will work as full-duplex.***
- If both switches support different speeds, they will each work at their own fastest speed.
- **The auto-MDIX feature will configure the interfaces eliminating the need for a crossover cable.***
- The connection will not be possible unless the administrator changes the cable to a crossover cable.
- The duplex capability has to be manually configured because it cannot be negotiated.

24. A Layer 2 switch is used to switch incoming frames from a 1000BASE-T port to a port connected to a 100Base-T network. Which method of memory buffering would work best for this task?

- port-based buffering
- level 1 cache buffering
- **shared memory buffering***
- fixed configuration buffering

25. When would a switch record multiple entries for a single switch port in its MAC address table?

- when a router is connected to the switch port
- when multiple ARP broadcasts have been forwarded
- **when another switch is connected to the switch port***
- when the switch is configured for Layer 3 switching

26. Which two statements describe a fixed configuration Ethernet switch? (Choose two.)

- The switch cannot be configured with multiple VLANs.
- An SVI cannot be configured on the switch.
- **A fixed configuration switch may be stackable. ***
- **The number of ports on the switch cannot be increased.***
- The port density of the switch is determined by the Cisco IOS.

27. How does adding an Ethernet line card affect the form factor of a switch?

- by increasing the back plane switching speed
- **by expanding the port density***
- by making the switch stackable
- by expanding the NVRAM capacity

28. Which address or combination of addresses does a Layer 3 switch use to make forwarding decisions?

- IP address only
- port address only
- MAC address only
- MAC and port addresses
- **MAC and IP addresses***

29. What statement illustrates a drawback of the CSMA/CD access method?

- Deterministic media access protocols slow network performance.
- It is more complex than non-deterministic protocols.
- **Collisions can decrease network performance.***
- CSMA/CD LAN technologies are only available at slower speeds than other LAN technologies.

30. Open the PT Activity. Perform the tasks in the activity instruction and then answer the question.

What destination address will PC1 include in the destination address field of the Ethernet frame that it sends to PC2?

- 192.168.0.17
- 192.168.0.34
- **0030.a3e5.0401***
- 00e0.b0be.8014
- 0007.ec35.a5c6

31. Match the characteristic to the forwarding method. (Not all options are used.)

Question as presented:

Match the characteristic to the forwarding method. (Not all options are used.)

always stores the entire frame	cut-through
checks the CRC before forwarding	Target
checks the frame length before forwarding	Target
does not forward broadcasts	Target
has low latency	store-and-forward
may forward runt frames	Target
begins forwarding when the destination address is received	Target
	Target

Question as presented:

Match the characteristic to the forwarding method. (Not all options are used.)

Characteristics	Forwarding Methods
always stores the entire frame	cut-through
checks the CRC before forwarding	cut-through
checks the frame length before forwarding	cut-through
does not forward broadcasts	cut-through
has low latency	cut-through
may forward runt frames	cut-through
begins forwarding when the destination address is received	cut-through
	store-and-forward
	store-and-forward
	store-and-forward
	store-and-forward
	store-and-forward
	store-and-forward

Note: The image shows a large red 'X' over the entire matching table, indicating that the matching is incorrect or that the question is flawed.

Sort elements

cut-through (A) -> low latency (A)*

cut-through (B) -> may forward runt frames (B)*

cut-through (C) -> begins forwarding when the destination address is received (C)*

store-and-forward (D) -> always stores the entire frame (D)*

store-and-forward (E) -> checks the CRC before forwarding (E)*

store-and-forward (F) -> checks the frame length before forwarding (F)

Explain:

A store-and-forward switch always stores the entire frame before forwarding, and checks its CRC and frame length. A cut-through switch can forward frames before receiving the destination address field, thus presenting less latency than a store-and-forward switch. Because the frame can begin to be forwarded before it is completely received, the switch may transmit a corrupt or runt frame. All forwarding methods require a Layer 2 switch to forward broadcast frames.

32. Which address or combination of addresses does a Layer 3 switch use to make forwarding decisions?

MAC and IP addresses*

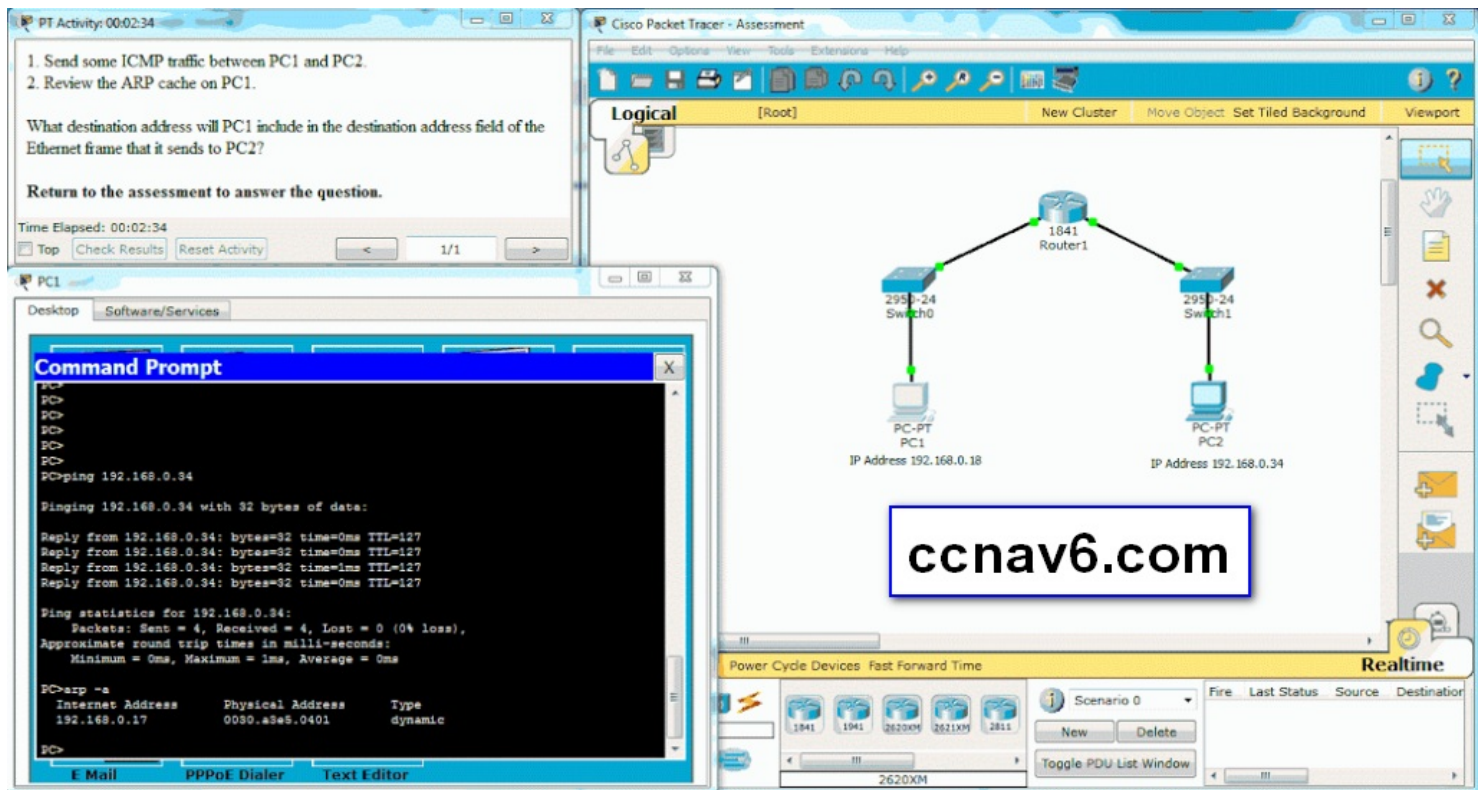
MAC address only

MAC and port addresses

port address only

IP address only

33. Launch PT. Hide and Save PT



Open the PT Activity. Perform the tasks in the activity instruction and then answer the question.

What destination address will PC1 include in the destination address field of the Ethernet frame that it sends to PC2?

00e0.b0be.8014

0030.a3e5.0401*

192.168.0.34

192.168.0.17

0007.ec35.a5c6

34. How does adding an Ethernet line card affect the form factor of a switch?

by increasing the back plane switching speed

by expanding the port density*

by expanding the NVRAM capacity

by making the switch stackable

35. What statement illustrates a drawback of the CSMA/CD access method?

Collisions can decrease network performance.*

Deterministic media access protocols slow network performance.

CSMA/CD LAN technologies are only available at slower speeds than other LAN technologies.

It is more complex than non-deterministic protocols.

36. A network administrator issues the following commands on a Layer 3 switch:

```
DLS1(config)# interface f0/3
DLS1(config-if)# no switchport
DLS1(config-if)# ip address 172.16.0.1 255.255.255.0
DLS1(config-if)# no shutdown
DLS1(config-if)# end
```

What is the administrator configuring?

a Cisco Express Forwarding instance

a routed port*

a trunk interface

a switched virtual interface

37. Fill in the blank.

The binary number 0000 1010 can be expressed as “**A**” in hexadecimal.

38. Match the seven fields of an Ethernet frame to their respective contents. (Not all options are used.)

Match the seven fields of an Ethernet frame to their respective contents. (Not all options are used.)

Beginning of frame - Field 1	Start Frame Delimiter
Field 2	Source MAC Address
Field 3	Encapsulated Data
Field 4	Flag
Field 5	Preamble
Field 6	Destination MAC Address
End of frame - Field 7	Length/Type
	Frame Check Sequence
	Session ID

Match the seven fields of an Ethernet frame to their respective contents. (Not all options are used.)

	Field 2
	Field 4
	Field 6
	Flag
	Beginning of frame - Field 1
	Field 3
	Field 5
	End of frame - Field 7
	Session ID

Sort elements

Start Frame Delimiter -> Field 2*

Source MAC Address -> Field 4*

Encapsulated Data -> Field 6*

Preamble -> Beginning of frame – Field 1*

Destination MAC Address -> Field 3*

Length/Type -> Field 5*

Frame Check Sequence -> End of frame – Field 7

39. True or False?

When a device is sending data to another device on a remote network, the Ethernet frame is sent to the MAC address of the default gateway.

true*

false

Explain:

A MAC address is only useful on the local Ethernet network. When data is destined for a remote network of any type, the data is sent to the default gateway device, the Layer 3 device that routes for the local network.

40. The ARP table in a switch maps which two types of address together?

Layer 3 address to a Layer 2 address*

Layer 3 address to a Layer 4 address

Layer 4 address to a Layer 2 address

Layer 2 address to a Layer 4 address

Explain:

The switch ARP table keeps a mapping of Layer 2 MAC addresses to Layer 3 IP addresses. These mappings can be learned by the switch dynamically through ARP or statically through manual configuration.

41. Refer to the exhibit.

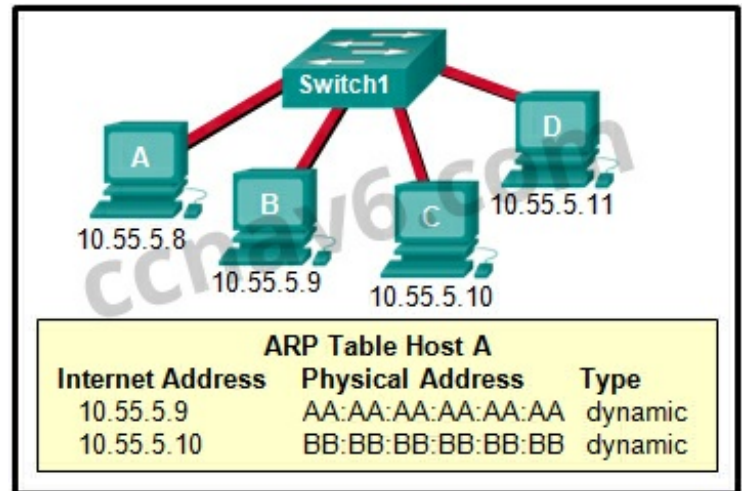
A switch with a default configuration connects four hosts. The ARP table for host A is shown. What happens when host A wants to send an IP packet to host D?

Host A sends an ARP request to the MAC address of host D.

Host D sends an ARP request to host A.

Host A sends out the packet to the switch. The switch sends the packet only to the host D, which in turn responds.

Host A sends out a broadcast of FF:FF:FF:FF:FF:FF. Every other host connected to the switch receives the broadcast and host D responds with its MAC address.*



Explain:

Whenever the destination MAC address is not contained within the ARP table of the originating host, the host (host A in this example) will send a Layer 2 broadcast that has a destination MAC address of FF:FF:FF:FF:FF:FF. All devices on the same network receive this broadcast. Host D will respond to this broadcast.

42. Refer to the exhibit.

The switches are in their default configuration. Host A needs to communicate with host D, but host A does not have the MAC address for its default gateway. Which network hosts will receive the ARP request sent by host A?

only host D

only router R1

only hosts A, B, and C

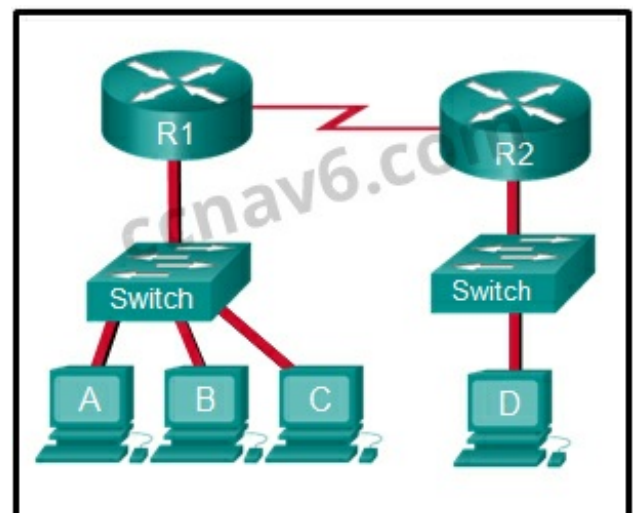
only hosts A, B, C, and D

only hosts B and C

only hosts B, C, and router R1*

Explain:

Since host A does not have the MAC address of the default gateway in its ARP table, host A sends an ARP broadcast. The ARP broadcast would be sent to every device on the local network. Hosts B, C, and router R1 would receive the broadcast. Router R1 would not forward the message.



43. Which statement describes the treatment of ARP requests on the local link?

They must be forwarded by all routers on the local network.

They are received and processed by every device on the local network.*

They are dropped by all switches on the local network.

They are received and processed only by the target device.

Explain:

Which statement describes the treatment of ARP requests on th

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1. **Which characteristic of the network layer in the OSI model allows carrying packets for multiple types of communications among many hosts?**

- the de-encapsulation of headers from lower layers
- the selection of paths for and direct packets toward the destination
- **the ability to operate without regard to the data that is carried in each packet***
- the ability to manage the data transport between processes running on hosts

Explain:

The function of the network layer protocols specifies the packet structure and processing used to carry the data from one host to another host. The actual communication data is encapsulated in the network layer PDU. The feature of its operation without regard to the data carried in each packet allows the network layer to carry packets for multiple types of communications.

2. **What are two characteristics of IP? (Choose two.)**

- **does not require a dedicated end-to-end connection ***
- **operates independently of the network media***
- retransmits packets if errors occur
- re-assembles out of order packets into the correct order at the receiver end
- guarantees delivery of packets

Explain:

The Internet Protocol (IP) is a connectionless, best effort protocol. This means that IP requires no end-to-end connection nor does it guarantee delivery of packets. IP is also media independent, which means it operates independently of the network media carrying the packets.

3. **When a connectionless protocol is in use at a lower layer of the OSI model, how is missing data detected and retransmitted if necessary?**

- Connectionless acknowledgements are used to request retransmission.
- **Upper-layer connection-oriented protocols keep track of the data received and can request retransmission from the upper-level protocols on the sending host.***
- Network layer IP protocols manage the communication sessions if connection-oriented transport services are not available.
- The best-effort delivery process guarantees that all packets that are sent are received.

Explain:

When connectionless protocols are in use at a lower layer of the OSI model, upper-level protocols may need to work together on the sending and receiving hosts to account for and retransmit lost data. In some cases, this is not necessary, because for some applications a certain amount of data loss is tolerable.

4. Which field in the IPv4 header is used to prevent a packet from traversing a network endlessly?

- **Time-to-Live***
- Sequence Number
- Acknowledgment Number
- Differentiated Services

Explain:

The value of the Time-to-Live (TTL) field in the IPv4 header is used to limit the lifetime of a packet. The sending host sets the initial TTL value; which is decreased by one each time the packet is processed by a router. If the TTL field decrements to zero, the router discards the packet and sends an Internet Control Message Protocol (ICMP) Time Exceeded message to the source IP address. The Differentiated Services (DS) field is used to determine the priority of each packet. Sequence Number and Acknowledgment Number are two fields in the TCP header.

5. What IPv4 header field identifies the upper layer protocol carried in the packet?

- **Protocol***
- Identification
- Version
- Differentiated Services

Explain:

It is the Protocol field in the IP header that identifies the upper-layer protocol the packet is carrying. The Version field identifies the IP version. The Differential Services field is used for setting packet priority. The Identification field is used to reorder fragmented packets.

6. What is one advantage that the IPv6 simplified header offers over IPv4?

- smaller-sized header
- little requirement for processing checksums
- smaller-sized source and destination IP addresses
- **efficient packet handling***

Explain:

The IPv6 simplified header offers several advantages over IPv4:

- Better routing efficiency and efficient packet handling for performance and forwarding-rate scalability
- No requirement for processing checksums
- Simplified and more efficient extension header mechanisms (as opposed to the IPv4 Options field)
- A Flow Label field for per-flow processing with no need to open the transport inner packet to identify the various traffic flows

7. Refer to the exhibit. Which route from the PC1 routing table will be used to reach PC2?

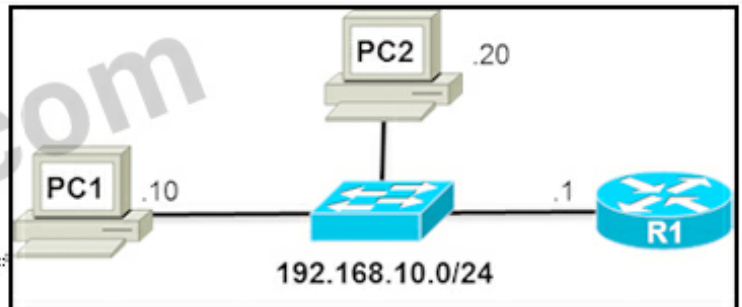
```
C:\Users\PC1> netstat -r
```

<Output omitted>

IPv4 Route Table

Active Routes:

Network Destination	Netmask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	192.168.10.1	192.168.10.10	25
127.0.0.0	255.0.0.0	On-link	127.0.0.1	306
127.0.0.1	255.255.255.255	On-link	127.0.0.1	306
127.255.255.255	255.255.255.255	On-link	127.0.0.1	306
192.168.10.0	255.255.255.0	On-link	192.168.10.10	281
192.168.10.10	255.255.255.255	On-link	192.168.10.10	281
192.168.10.255	255.255.255.255	On-link	192.168.10.10	281
224.0.0.0	240.0.0.0	On-link	127.0.0.1	306
224.0.0.0	240.0.0.0	On-link	192.168.10.10	281
255.255.255.255	255.255.255.255	On-link	127.0.0.1	306
255.255.255.255	255.255.255.255	On-link	192.168.10.10	281



A.

Network Destination	Netmask	Gateway	Interface	Metric
192.168.10.0	255.255.255.0	On-link	192.168.10.10	281

B.

Network Destination	Netmask	Gateway	Interface	Metric
192.168.10.10	255.255.255.255	On-link	192.168.10.10	281

C.

Network Destination	Netmask	Gateway	Interface	Metric
127.0.0.1	255.255.255.255	On-link	127.0.0.1	306

D.

Network Destination	Netmask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	192.168.10.1	192.168.10.10	25

Correct answer: A

Explain:

PC1 and PC2 are both on network 192.168.10.0 with mask 255.255.255.0, so there is no need to access the default gateway (entry 0.0.0.0 0.0.0.0). Entry 127.0.0.1 255.255.255.255 is the loopback interface and entry 192.168.10.10 255.255.255.255 identifies the PC1 address interface.

8. Refer to the exhibit. R1 receives a packet destined for the IP address 192.168.2.10. Out which interface will R1 forward the packet?

```
R1# show ip route
<output omitted>

172.16.0.0/24 is subnetted, 3 subnets
D    172.16.10.0 [90/2297856] via 172.16.1.2, 00:06:49, <output omitted>
C    172.16.11.0 is directly connected, FastEthernet0/1
C    172.16.1.0 is directly connected, Serial0/0/1
10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
C    10.10.1.0/24 is directly connected, FastEthernet0/1
C    10.3.3.0/24 is directly connected, FastEthernet0/0
C    10.1.0.0/16 is directly connected, Serial0/0/0
D    192.168.1.0/24 [90/2681856] via 172.16.1.2, 00:07:42, <output omitted>
      [90/2681856] via 10.1.1.2, 00:07:42, <output omitted>
D    192.168.2.0/24 [90/2297856] via 172.16.1.2, 00:06:34, <output omitted>
C    192.168.3.0/24 is directly connected, FastEthernet0/0
```

- FastEthernet0/0
- FastEthernet0/1
- Serial0/0/0
- **Serial0/0/1***

Explain:

If a route in the routing table points to a next hop address, the router will perform a second lookup to determine out which interface the next hop is located.

9. What type of route is indicated by the code C in an IPv4 routing table on a Cisco router?

- static route
- default route
- **directly connected route***
- dynamic route that is learned through EIGRP

Explain:

Some of the IPv4 routing table codes include the following:

C – directly connected

S – static

D – EIGRP

* – candidate default

10. What routing table entry has a next hop address associated with a destination network?

- directly-connected routes

- local routes
- **remote routes***
- C and L source routes

Explain:

Routing table entries for remote routes will have a next hop IP address. The next hop IP address is the address of the router interface of the next device to be used to reach the destination network. Directly-connected and local routes have no next hop, because they do not require going through another router to be reached.

11. Which statement describes a hardware feature of a Cisco 1941 router that has the default hardware configuration?

- It does not have an AUX port.
- It has three FastEthernet interfaces for LAN access.
- **It has two types of ports that can be used to access the console.***
- It does not require a CPU because it relies on Compact Flash to run the IOS.

Explain:

The connections in a Cisco 1941 router include two types of ports that are used for initial configuration and command-line interface management access. The two ports are the regular RJ-45 port and a new USB Type-B (mini-B USB) connector. In addition, the router has an AUX port for remote management access, and two Gigabit Ethernet interfaces for LAN access. Compact Flash can be used increase device storage, but it does not perform the functions of the CPU, which is required for operation of the device.

12. Following default settings, what is the next step in the router boot sequence after the IOS loads from flash?

- Perform the POST routine.
- **Locate and load the startup-config file from NVRAM.***
- Load the bootstrap program from ROM.
- Load the running-config file from RAM.

Explain:

There are three major steps to the router boot sequence:

Perform Power-On-Self-Test (POST)

Load the IOS from Flash or TFTP server

Load the startup configuration file from NVRAM

13. What are two types of router interfaces? (Choose two.)

- SVI
- **LAN***
- DHCP
- Telnet
- **WAN***

Explain:

Router interfaces can be grouped into two categories:

- LAN interfaces – Used for connecting cables that terminate with LAN devices, such as computers and switches. This interface can also be used to connect routers to each other.
- WAN interfaces – Used for connecting routers to external networks, usually over a larger geographical distance.

14. **Which two pieces of information are in the RAM of a Cisco router during normal operation? (Choose two.)**

- **Cisco IOS***
- backup IOS file
- **IP routing table***
- basic diagnostic software
- startup configuration file

Explain:

The Cisco IOS file is stored in flash memory and copied into RAM during the boot up. The IP routing table is also stored in RAM. The basic diagnostic software is stored in ROM and the startup configuration file is stored in NVRAM.

15. **A router boots and enters setup mode. What is the reason for this?**

- The IOS image is corrupt.
- Cisco IOS is missing from flash memory.
- **The configuration file is missing from NVRAM.***
- The POST process has detected hardware failure.

16. **What is the purpose of the startup configuration file on a Cisco router?**

- to facilitate the basic operation of the hardware components of a device
- **to contain the commands that are used to initially configure a router on startup***
- to contain the configuration commands that the router IOS is currently using
- to provide a limited backup version of the IOS, in case the router cannot load the full featured IOS

Explain:

The startup configuration file is stored in NVRAM and contains the commands needed to initially configure a router. It also creates the running configuration file that is stored in RAM.

17. **Which three commands are used to set up secure access to a router through a connection to the console interface? (Choose three.)**

- interface fastethernet 0/0
- line vty 0 4
- **line console 0***
- enable secret cisco
- **login ***
- **password cisco ***

Explain:

The three commands needed to password protect the console port are as follows:

```
line console 0
password cisco
login
```

The interface fastethernet 0/0 command is commonly used to access the configuration mode used to apply specific parameters such as the IP address to the Fa0/0 port. The line vty 0 4 command is used to access the configuration mode for Telnet. The 0 and 4 parameters specify ports 0 through 4, or a maximum of five simultaneous Telnet connections. The enable secret command is used to apply a password used on the router to access the privileged mode.

18. Which characteristic describes an IPv6 enhancement over IPv4?

- IPv6 addresses are based on 128-bit flat addressing as opposed to IPv4 which is based on 32-bit hierarchical addressing.
- **The IPv6 header is simpler than the IPv4 header is, which improves packet handling.***
- Both IPv4 and IPv6 support authentication, but only IPv6 supports privacy capabilities.
- The IPv6 address space is four times bigger than the IPv4 address space.

Explain:

IPv6 addresses are based on 128-bit hierarchical addressing, and the IPv6 header has been simplified with fewer fields, improving packet handling. IPv6 natively supports authentication and privacy capabilities as opposed to IPv4 that needs additional features to support those. The IPv6 address space is many times bigger than IPv4 address space.

19. Open the PT Activity. The enable password on all devices is cisco. Perform the tasks in the activity instructions and then answer the question. For what reason is the failure occurring?

- PC1 has an incorrect default gateway configured.
- **SW1 does not have a default gateway configured.***
- The IP address of SW1 is configured in a wrong subnet.
- PC2 has an incorrect default gateway configured.

Explain:

The ip default-gateway command is missing on the SW1 configuration. Packets from PC2 are able to successfully reach SW1, but SW1 is unable to forward reply packets beyond the local network without the ip default-gateway command issued.

20. Match the command with the device mode at which the command is entered. (Not all options are used.)

- Question

Question as presented:

Match the command with the device mode at which the command is entered. (Not all options are used.)

login	R1(config)#
service password-encryption	R1>
ip address 192.168.4.4 255.255.255.0	R1(config-router)#
copy running-config startup-config	R1#
enable	R1(config-line)#
	R1(config-if)#

◦ Answer

Question as presented:

Match the command with the device mode at which the command is entered. (Not all options are used.)

login	R1(config)#
service password-encryption	R1>
ip address 192.168.4.4 255.255.255.0	R1(config-router)#
copy running-config startup-config	R1#
enable	R1(config-line)#
	R1(config-if)#

Explain:

The enable command is entered in R1> mode. The login command is entered in R1(config-line)# mode. The copy running-config startup-config command is entered in R1# mode. The ip address 192.168.4.4 255.255.255.0 command is entered in R1(config-if)# mode. The service password-encryption command is entered in global configuration mode.

21. When connectionless protocols are implemented at the lower layers of the OSI model, what are usually used to acknowledge the data receipt and request the retransmission of missing data?

- connectionless acknowledgements
- **upper-layer connection-oriented protocols***
- Network layer IP protocols
- Transport layer UDP protocols

22. Which IPv4 header field is responsible for defining the priority of the packet?

- flow label
- flags

- **differentiated services***
- traffic class

23. Why is NAT not needed in IPv6?

- Because IPv6 has integrated security, there is no need to hide the IPv6 addresses of internal networks.?
- **Any host or user can get a public IPv6 network address because the number of available IPv6 addresses is extremely large.?***
- The problems that are induced by NAT applications are solved because the IPv6 header improves packet handling by intermediate routers.?
- The end-to-end connectivity problems that are caused by NAT are solved because the number of routes increases with the number of nodes that are connected to the Internet.

24. What is a service provided by the Flow Label field of the IPv6 header?

- It limits the lifetime of a packet.
- It identifies the total length of the IPv6 packet.
- It classifies packets for traffic congestion control.
- **It informs network devices to maintain the same path for real-time application packets.***

25. How do hosts ensure that their packets are directed to the correct network destination?

- **They have to keep their own local routing table that contains a route to the loopback interface, a local network route, and a remote default route.?***
- They always direct their packets to the default gateway, which will be responsible for the packet delivery.
- They search in their own local routing table for a route to the network destination address and pass this information to the default gateway.
- They send a query packet to the default gateway asking for the best route.

26. Which two commands can be used on a Windows host to display the routing table? (Choose two.)

- netstat -s
- **route print***
- show ip route
- **netstat -r***
- tracer

27. During the process of forwarding traffic, what will the router do immediately after matching the destination IP address to a network on a directly connected routing table entry?

- discard the traffic after consulting the route table
- look up the next-hop address for the packet
- **switch the packet to the directly connected interface***
- analyze the destination IP address

28. A technician is configuring a router that is actively running on the network. Suddenly, power to the router is lost. If the technician has not saved the configuration, which two types of information will be lost?

(Choose two.)

- Cisco IOS image file
- **routing table***
- bootstrap file
- **ARP cache***
- startup configuration

29. Which two interfaces will allow access via the VTY lines to configure the router? (Choose two.)

- aux interfaces
- **LAN interfaces ***
- **WAN interfaces***
- console interfaces
- USB interfaces

30. Which two files, if found, are copied into RAM as a router with the default configuration register setting boots up? (Choose two.)

- running configuration
- **IOS image file ***
- **startup configuration***
- POST diagnostics

31. When would the Cisco IOS image held in ROM be used to boot the router?

- during a file transfer operation
- during a normal boot process
- **when the full IOS cannot be found***
- when the running configuration directs the router to do this

32. After troubleshooting a router, the network administrator wants to save the router configuration so that it will be used automatically the next time that the router reboots. What command should be issued?

- copy running-config flash
- copy startup-config flash
- **copy running-config startup-config ***
- reload*
- copy startup-config running-config

33. Which three commands are used to set up a password for a person who attaches a cable to a new router so that an initial configuration can be performed? (Choose three.)

- interface fastethernet 0/0
- line vty 0 4
- **line console 0***

- enable secret cisco
- **login ***
- **password cisco***

34. Which statement about router interfaces is true?

- Router LAN interfaces are not activated by default, but router WAN interfaces are.
- **Once the no shutdown command is given, a router interface is active and operational.***
- Commands that apply an IP address and subnet mask to an interface are entered in global configuration mode.
- **A configured and activated router interface must be connected to another device in order to operate.***

35. Which command displays a summary chart of all router interfaces, their IP addresses, and their current operational status?

- show ip route
- show version
- show interfaces
- **show ip interface brief***

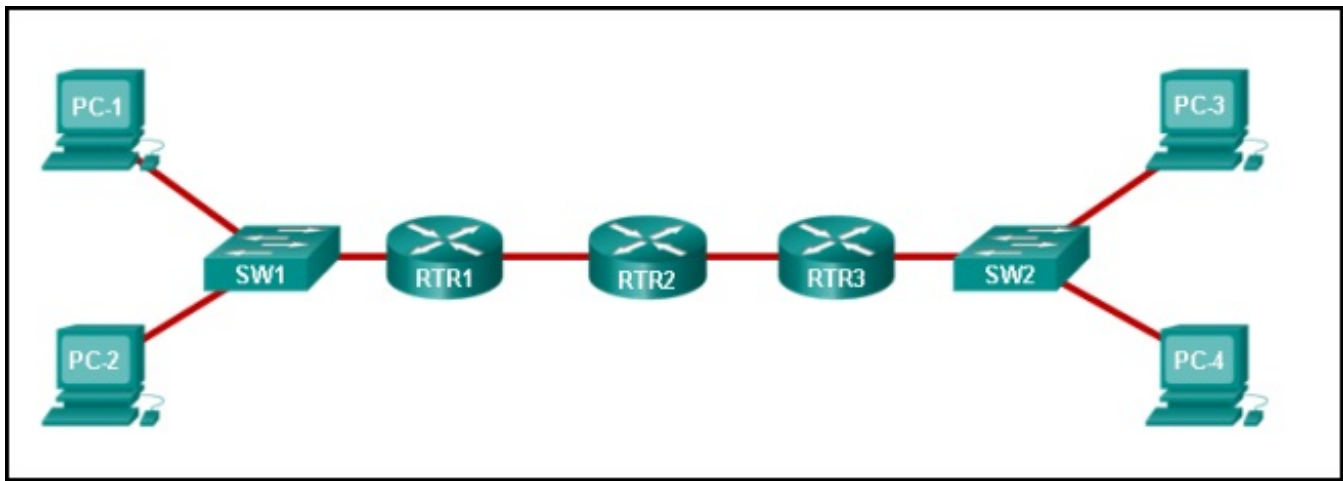
36. A technician is manually configuring a computer with the necessary IP parameters to communicate over the corporate network. The computer already has an IP address, a subnet mask, and a DNS server. What else has to be configured for Internet access?

- the WINS server address
- **the default gateway address***
- the MAC address
- the domain name of the organization

37. A computer has to send a packet to a destination host in the same LAN. How will the packet be sent?

- The packet will be sent to the default gateway first, and then, depending on the response from the gateway, it may be sent to the destination host.
- **The packet will be sent directly to the destination host.***
- The packet will first be sent to the default gateway, and then from the default gateway it will be sent directly to the destination host.
- The packet will be sent only to the default gateway.

38. Refer to the exhibit. Fill in the blank.



A packet leaving PC-1 has to traverse 3 hops to reach PC-4.?

39. Fill in the blank. In a router, ROM is the nonvolatile memory where the diagnostic software, the bootup instructions, and a limited IOS are stored.

40. Refer to the exhibit. Match the packets with their destination IP address to the exiting interfaces on the router. (Not all targets are used.)

<output omitted>

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

```

    10.0.0.0/24 is subnetted, 1 subnets
C       10.1.0.0 is directly connected, Serial0/0/0
    172.17.0.0/24 is subnetted, 4 subnets
O       172.17.6.0 [110/2] via 192.168.3.4, 00:10:41, FastEthernet0/0
O       172.17.10.0 [110/2] via 192.168.5.2, 00:09:52, FastEthernet1/1
O       172.17.12.0 [110/2] via 192.168.4.2, 00:12:23, FastEthernet1/0
C       172.17.14.0 is directly connected, FastEthernet0/1
C       192.168.3.0/24 is directly connected, FastEthernet0/0
C       192.168.4.0/24 is directly connected, FastEthernet1/0
C       192.168.5.0/24 is directly connected, FastEthernet1/1
S*     0.0.0.0/0 is directly connected, Serial0/0/0

```

packets with destination of 172.17.10.5	FastEthernet0/0
packets with destination of 172.17.12.10	FastEthernet0/1
packets with destination of 172.17.14.8	FastEthernet1/0
packets with destination of 172.17.8.20	FastEthernet1/1
packets with destination of 172.17.6.15	Serial0/0/0
	The packet is dropped.

packets with destination of 172.17.6.15
packets with destination of 172.17.14.8
packets with destination of 172.17.12.10
packets with destination of 172.17.10.5
packets with destination of 172.17.8.20
The packet is dropped.

41. Open the PT Activity. Perform the tasks in the activity instructions and then answer the question or complete the task.

Does the router have enough RAM and flash memory to support the new IOS?

- The router has enough RAM and flash memory for the IOS upgrade.*
- The router has enough RAM, but needs more flash memory for the IOS upgrade.
- The router has enough flash memory, but needs more RAM for the IOS upgrade.
- The router needs more RAM and more flash memory for the IOS upgrade.

42. Match the configuration mode with the command that is available in that mode. (Not all options are used.)

Match the configuration mode with the command that is available in that mode. (Not all options are used.)

R1(config-line)#	enable
R1#	copy running-config startup-config
R1(config-if)#	login
R1>	interface fastethernet 0/0
R1(config)#	

Match the configuration mode with the command that is available in that mode. (Not all options are used.)

	R1>
	R1#
R1(config-if)#	R1(config-line)#
	R1(config)#

Sort elements

enable -> R1>

copy running-config startup-config -> R1#

login -> R1(config-line)#

interface fastethernet 0/0 -> R1(config)#

43. Match field names to the IP header where they would be found. (Not all options are used)

Match field names to the IP header where they would be found. (Not all options are used.)

Total Length	IP v4 header
Traffic Class	field name
Length/Type	field name
Flags	IP v6 header
Flow Label	field name
	field name

Match field names to the IP header where they would be found. (Not all options are used.)

Length/Type	IP v4 header
	Flags
	Total Length
	IP v6 header
	Traffic Class
	Flow Label

Sort elements

IP v4 Header (A) -> Flags (A)

IP v4 Header (B) -> Total Length (B)

IP v6 Header (C) ->Traffic Class (C)

IP v6 Header (D) -> Flow Label (D)

44. Which type of static route that is configured on a router uses only the exit interface?

fully specified static route

default static route

directly connected static route*

recursive static route

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