

# ITN (Version 7.00) - Ethernet Concepts Exam

Below is the feedback on items for which you did not receive full credit. Some interactive items may not display your response.

Subscore: Domain Knowledge - Standard Score ▼

## 1 Question as presented:

Match the situation with the appropriate use of network media.

backbone cabling in an enterprise

guest access in a coffee shop

horizontal cabling structure

waiting rooms in a hospital

desktop PCs in an enterprise office

long-haul networks

### Copper Cables

Target

Target

### Fiber Optic

Target

Target

### Wireless

Target

Target

Copper Cables - horizontal cabling structure and desktop PCs in offices in an enterprise<br /> Fiber optic - backbone cabling in an enterprise and long-haul networks<br /> Wireless - coffee shops and waiting rooms in a hospital

This item references content from the following areas:

ITN

1.4.6 Wireless Media

## Your response:

Match the situation with the appropriate use of network media.

backbone cabling in an enterprise

guest access in a coffee shop

horizontal cabling structure

waiting rooms in a hospital

desktop PCs in an enterprise office

long-haul networks

### Copper Cables

Target

Target

**Fiber Optic****Target****Target****Wireless****Target****Target**

**2 A network administrator is measuring the transfer of bits across the company backbone for a mission critical financial application. The administrator notices that the network throughput appears lower than the bandwidth expected. Which three factors could influence the differences in throughput? (Choose three.)**

**Correct Response**      **Your Response**

- ☒ the amount of traffic that is currently crossing the network
- ☐ the sophistication of the encapsulation method applied to the data
- ☒ the type of traffic that is crossing the network
- ☒ the latency that is created by the number of network devices that the data is crossing
- ☐ the bandwidth of the WAN connection to the Internet
- ☐ the reliability of the gigabit Ethernet infrastructure of the backbone

Throughput usually does not match the specified bandwidth of physical links due to multiple factors. These factors include, the amount of traffic, type of traffic, and latency created by the network devices the data has to cross.

This item references content from the following areas:

ITN

1.4.2 Physical Layer Characteristics

## 4 What is a primary role of the Physical layer in transmitting data on the network?

| Correct<br>Response | Your<br>Response |
|---------------------|------------------|
|---------------------|------------------|

- ☒ create the signals that represent the bits in each frame on to the media
- ☐ provide physical addressing to the devices
- ☐ control data access to the media
- ☐ determine the path packets take through the network

The OSI physical layer provides the means to transport the bits that make up a frame across the network media. This layer accepts a complete frame from the data link layer and encodes it as a series of signals that are transmitted to the local media.

This item references content from the following areas:

ITN

1.4.1 Purpose of the Physical Layer

## 5 With the use of unshielded twisted-pair copper wire in a network, what causes crosstalk within the cable pairs?

| Correct<br>Response | Your<br>Response |
|---------------------|------------------|
|---------------------|------------------|

- ☐ the collision caused by two nodes trying to use the media simultaneously
- ☐ the reflection of the electrical wave back from the far end of the cable



- ☐ the magnetic field around the adjacent pairs of wire
- ☐ the use of braided wire to shield the adjacent wire pairs

Crosstalk is a type of noise, or interference that occurs when signal transmission on one wire interferes with another wire. When current flows through a wire a magnetic field is produced. The produced magnetic field will interface the signal carried in the adjacent wire.

This item references content from the following areas:

ITN

1.4.4 UTP Cabling

6



**Refer to the graphic. What type of cabling is shown?**

| Correct Response | Your Response |
|------------------|---------------|
|------------------|---------------|

- ☐ STP
- ☐ coax
- ☒ fiber
- ☐ UTP

Network cabling include different types of cables:

UTP cable consists of four pairs of color-coded wires that have been twisted together and then encased in a flexible plastic sheath.

STP cable uses four pairs of wires, each wrapped in a foil shield, which are then wrapped in an overall metallic braid or foil.

Coaxial cable uses a copper conductor and a layer of flexible plastic insulation surrounds the copper conductor.

Fiber cable is a flexible, extremely thin, transparent strand of glass surrounded by plastic insulation.

This item references content from the following areas:

ITN

1.4.5 Fiber-Optic Cabling

8



Refer to the graphic. What type of cabling is shown?

| Correct Response | Your Response |
|------------------|---------------|
|------------------|---------------|

- ☐ fiber
- ☐ coax
- ☐ STP
- ☒ UTP

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This item references content from the following areas:

ITN

1.4.4 UTP Cabling

## 11 What is the function of the CRC value that is found in the FCS field of a frame?

**Correct Response**      **Your Response**

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

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.

This item references content from the following areas:

ITN

1.6.3 Data Link Frame

## 14 A network team is comparing physical WAN topologies for connecting remote sites to a headquarters building. Which topology provides high availability and connects some, but not all, remote sites?

**Correct Response**      **Your Response**

- ☐ hub and spoke
- ☒ partial mesh
- ☐ point-to-point
- ☐ mesh

Partial mesh topologies provide high availability by interconnecting multiple remote sites, but do not require a connection between all remote sites. A mesh topology requires point-to-point links with every system being connected to every other system. A point-to-point topology is where each device is connected to one other device. A hub and spoke uses a central device in a star topology that connects to other point-to-point devices.

This item references content from the following areas:

ITN

1.6.2 Topologies

## 15 Which two fields or features does Ethernet examine to determine if a received frame is passed to the data link layer or discarded by the NIC? (Choose two.)

| Correct Response | Your Response |
|------------------|---------------|
|------------------|---------------|

- |                                     |                      |
|-------------------------------------|----------------------|
| <input type="checkbox"/>            | source MAC address   |
| <input type="checkbox"/>            | auto-MDIX            |
| <input checked="" type="checkbox"/> | Frame Check Sequence |
| <input checked="" type="checkbox"/> | minimum frame size   |
| <input type="checkbox"/>            | CEF                  |

An Ethernet frame is not processed and is discarded if it is smaller than the minimum (64 bytes) or if the calculated frame check sequence (FCS) value does not match the received FCS value. Auto-MDIX (automatic medium-dependent interface crossover) is Layer 1 technology that detects cable straight-through or crossover types. The source MAC address is not used to determine how the frame is received. CEF (Cisco Express Forwarding) is a technology used to expedite Layer 3 switching.

This item references content from the following areas:

ITN

1.7.1 Ethernet Frames

## 16 Which media communication type does not require media arbitration in the data link layer?

| Correct Response | Your Response |
|------------------|---------------|
|------------------|---------------|

- |                       |                   |
|-----------------------|-------------------|
| <input type="radio"/> | deterministic     |
| <input type="radio"/> | controlled access |



☐ full-duplex☐ half-duplex

Half-duplex communication occurs when both devices can both transmit and receive on the medium but cannot do so simultaneously. Full-duplex communication occurs when both devices can transmit and receive on the medium at the same time and therefore does not require media arbitration. Half-duplex communication is typically contention-based, whereas controlled (deterministic) access is applied in technologies where devices take turns to access the medium.

This item references content from the following areas:

ITN

1.6.2 Topologies

## 19 What are three ways that media access control is used in networking? (Choose three.)

| Correct<br>Response | Your<br>Response |
|---------------------|------------------|
|---------------------|------------------|

☐ Ethernet utilizes CSMA/CD.☐ Contention-based access is also known as deterministic.☐ 802.11 utilizes CSMA/CD.☐ Media access control provides placement of data frames onto the media.☐ Data link layer protocols define the rules for access to different media.☐ Networks with controlled access have reduced performance due to data collisions.

Wired Ethernet networks use CSMA/CD for media access control. IEEE 802.11 wireless networks use CSMA/CA, a similar method. Media access control defines the way data frames get placed on the media. The controlled access method is deterministic, not a contention-based access to networks. Because each device has its own time to use the medium, controlled access networks such as legacy Token Ring do not have collisions.


This item references content from the following areas:

ITN

1.6.2 Topologies

## 20 During the encapsulation process, what occurs at the data link layer for a PC connected to an Ethernet network?

**Correct Response**      **Your Response**

- ☐ The process port number is added.
-  ☒ The physical address is added.
- ☐ An IP address is added.
- ☐ The logical address is added.

The Ethernet frame includes the source and destination physical address. The trailer includes a CRC value in the Frame Check Sequence field to allow the receiving device to determine if the frame has been changed (has errors) during the transmission.


This item references content from the following areas:

ITN

1.6.3 Data Link Frame

## 22 What type of communication rule would best describe CSMA/CD?

**Correct Response**      **Your Response**

- ☐ flow control
-  ☒ access method
- ☐ message encapsulation
- ☐ message encoding

Carrier sense multiple access collision detection (CSMA/CD) is the access method used with Ethernet. The access method rule of communication dictates how a network device is able to place a signal on the carrier. CSMA/CD dictates those rules on an Ethernet network and CSMA/CA dictates those rules on an 802.11 wireless LAN.




This item references content from the following areas:

ITN

1.6.2 Topologies

## 23 Which three basic parts are common to all frame types supported by the data link layer? (Choose three.)

**Correct Response**      **Your Response**

- ☐ type field
-  ☐ trailer
- ☐ CRC value
-  ☐ data
- ☐ MTU size
-  ☐ header

The data link protocol is responsible for NIC-to-NIC communications within the same network. Although there are many different data link layer protocols that describe data link layer frames, each frame type has three basic parts:

Header

Data

Trailer


This item references content from the following areas:

ITN

1.6.2 Topologies

## 24 Which statement is true about the CSMA/CD access method that is used in Ethernet?

**Correct Response**      **Your Response**

- ☐ A jamming signal causes only devices that caused the collision to execute a backoff algorithm.
- ☐ When a device hears a carrier signal and transmits, a collision cannot occur.
-  ☐ All network devices must listen before transmitting.

- ☐ Devices involved in a collision get priority to transmit after the backoff period.

Legacy bus-topology Ethernet LAN uses CSMA/CD as network media access control protocol. It works by detecting a collision in the medium and backing off (after transmitting a jam signal) as necessary. When one host wants to transmit a frame, it listens on the medium to check if the medium is busy. After it senses that no one else is transmitting, the host starts transmitting the frame, it also monitors the current level to detect a collision. If it detects a collision, it transmits a special jam signal so that all other hosts can know there was a collision. The other host will receive this jam signal and stop transmitting. After this, both hosts enter an exponential backoff phase and retry transmission.

This item references content from the following areas:

ITN

1.6.2 Topologies

### 30 What is the purpose of the FCS field in a frame?

| Correct<br>Response | Your<br>Response |
|---------------------|------------------|
|---------------------|------------------|

- |                                  |   |
|----------------------------------|---|
| <input type="radio"/>            | to obtain the MAC address of the sending node                     |
| <input checked="" type="radio"/> | to determine if errors occurred in the transmission and reception |
| <input type="radio"/>            | to compute the CRC header for the data field                      |
| <input type="radio"/>            | to verify the logical address of the sending node                 |

The FCS field in a frame is used to detect any errors in the transmission and receipt of a frame. This is done by comparing the CRC value within the frame against a computed CRC value of the frame. If the two values do not match, then the frame is discarded.

This item references content from the following areas:

ITN

1.7.1 Ethernet Frames

### 32 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.)

| Correct Response | Your Response |
|------------------|---------------|
|------------------|---------------|

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

Modern switches can negotiate to work in full-duplex mode if both switches are capable. They will negotiate to work using the fastest possible speed and the auto-MDIX feature is enabled by default, so a cable change is not needed.

This item references content from the following areas:

ITN

1.7.4 Switch Speeds and Forwarding Methods

### 33 Which advantage does the store-and-forward switching method have compared with the cut-through switching method?

| Correct Response | Your Response |
|------------------|---------------|
|------------------|---------------|

- |                                  |   |
|----------------------------------|---|
| <input type="radio"/>            | frame forwarding using IPv4 Layer 3 and 4 information |
| <input checked="" type="radio"/> | frame error checking                                  |
| <input type="radio"/>            | faster frame forwarding                               |
| <input checked="" type="radio"/> | collision detecting                                   |

A switch using the store-and-forward switching method performs an error check on an incoming frame by comparing the FCS value against its own FCS calculations after the entire frame is received. In comparison, a switch using the cut-through switching method makes quick forwarding decisions and starts the forwarding process without waiting for the entire frame to be received. Thus a switch using cut-through switching may send invalid frames to the network. The performance of store-and-forward switching is slower compared to cut-through

switching performance. Collision detection is monitored by the sending device. Store-and-forward switching does not use IPv4 Layer 3 and 4 information for its forwarding decisions.

This item references content from the following areas:

ITN

1.7.4 Switch Speeds and Forwarding Methods

### 34 When the store-and-forward method of switching is in use, what part of the Ethernet frame is used to perform an error check?

| Correct Response | Your Response |
|------------------|---------------|
|------------------|---------------|

- ☐ source MAC address in the header
- ☐ destination MAC address in the header
- ☒ CRC in the trailer
- ☐ protocol type in the header

The cyclic redundancy check (CRC) part of the trailer is used to determine if the frame has been modified during transit. If the integrity of the frame is verified, the frame is forwarded. If the integrity of the frame cannot be verified, then the frame is dropped.

This item references content from the following areas:

ITN

1.7.4 Switch Speeds and Forwarding Methods

### 35 Which switching method uses the CRC value in a frame?

| Correct Response | Your Response |
|------------------|---------------|
|------------------|---------------|

- ☐ fast-forward
- ☒ cut-through
- ☐ fragment-free



☐ store-and-forward

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.

This item references content from the following areas:

ITN

1.7.4 Switch Speeds and Forwarding Methods

### 36 What are two actions performed by a Cisco switch? (Choose two.)

| Correct<br>Response | Your<br>Response |
|---------------------|------------------|
|---------------------|------------------|

- |                                     |  |
|-------------------------------------|--|
| <input type="checkbox"/>            | examining the destination MAC address to add new entries to the MAC address table  |
| <input type="checkbox"/>            | forwarding frames with unknown destination IP addresses to the default gateway     |
| <input checked="" type="checkbox"/> | utilizing the MAC address table to forward frames via the destination MAC address  |
| <input checked="" type="checkbox"/> | using the source MAC addresses of frames to build and maintain a MAC address table |
| <input type="checkbox"/>            | building a routing table that is based on the first IP address in the frame header |

Important actions that a switch performs are as follows:

When a frame comes in, the switch examines the Layer 2 source address to build and maintain the Layer 2 MAC address table.

It examines the Layer 2 destination address to determine how to forward the frame. When the destination address is in the MAC address table, then the frame is sent out a particular port. When the address is unknown, the frame is sent to all ports that have devices connected to that network.

This item references content from the following areas:

ITN

1.7.3 The MAC Address Table

## 40 Which is a multicast MAC address?

Correct  
Response

Your  
Response



- ☐ 01-00-5E-00-00-03
- ☐ 00-26-0F-4B-00-3E
- ☐ 5C-26-0A-4B-19-3E
- ☒ FF-FF-FF-FF-FF-FF

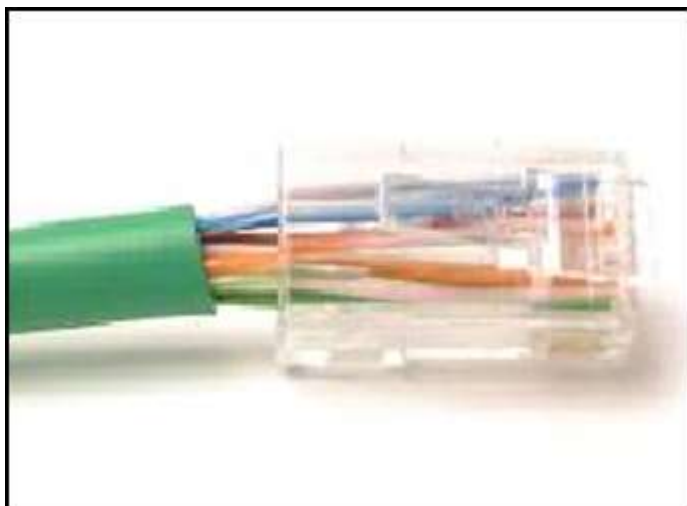
Multicast MAC addresses begin with the special value of 01-00-5E.

This item references content from the following areas:

ITN

1.7.2 Ethernet MAC Address

41



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

Correct  
Response

Your  
Response



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



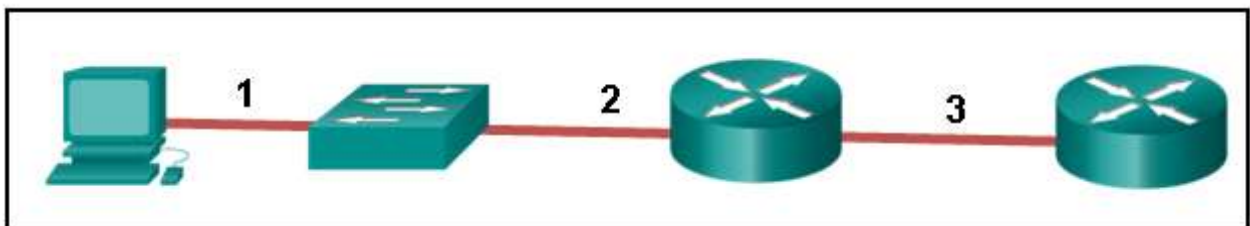
When a cable to an RJ-45 connector is terminated, it is important to ensure that the untwisted wires are not too long and that the flexible plastic sheath surrounding the wires is crimped down and not the bare wires. None of the colored wires should be visible from the bottom of the jack.

This item references content from the following areas:

ITN

1.4.4 UTP Cabling

42



**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?**

**Correct Response**      **Your Response**

- ☒ 1 - rollover, 2 - straight-through, 3 - crossover
- ☐ 1 - crossover, 2 - rollover, 3 - straight-through
- ☐ 1 - crossover, 2 - straight-through, 3 - rollover
- ☐ 1 - rollover, 2 - crossover, 3 - straight-through

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.

This item references content from the following areas:

ITN

1.4.4 UTP Cabling

### 43 Open the PT Activity. Perform the tasks in the activity instructions and then answer the question.

Which port does Switch0 use to send frames to the host with the IPv4 address 10.1.1.5?

Correct Response      Your Response

- ☐ Fa0/1
- ☐ Fa0/5
- ☐ Fa0/9
- ☒ Fa0/11

Issuing the command `ipconfig /all` from the PC0 command prompt displays the IPv4 address and MAC address. When the IPv4 address 10.1.1.5 is pinged from PC0, the switch stores the source MAC address (from PC0) along with the port to which PC0 is connected. When the destination reply is received, the switch takes the destination MAC address and compares to MAC addresses stored in the MAC address table. Issuing the **show mac-address-table** on the PC0 Terminal application displays two dynamic MAC address entries. The MAC address and port entry that does not belong to PC0 must be the MAC address and port of the destination with the IPv4 address 10.1.1.5.

This item references content from the following areas:

ITN

1.7.3 The MAC Address Table

### 44 What does the term "attenuation" mean in data communication?

Correct Response      Your Response

- ☐ time for a signal to reach its destination
- ☒ loss of signal strength as distance increases
- ☐ leakage of signals from one cable pair to another
- ☐ strengthening of a signal by a networking device




Data is transmitted on copper cables as electrical pulses. A detector in the network interface of a destination device must receive a signal that can be successfully decoded to match the signal sent. However, the farther the signal travels, the more it deteriorates. This is referred to as signal attenuation.

This item references content from the following areas:

ITN

1.4.3 Copper Cabling

## 45 What makes fiber preferable to copper cabling for interconnecting buildings? (Choose three.)

| Correct Response  | Your Response  |
|---|--|
|    | <input type="checkbox"/> greater bandwidth potential       |
|   | <input type="checkbox"/> easily terminated                 |
|   | <input type="checkbox"/> lower installation cost           |
|  | <input type="checkbox"/> limited susceptibility to EMI/RFI |
|   | <input type="checkbox"/> durable connections               |
|  | <input type="checkbox"/> greater distances per cable run   |

Optical fiber cable transmits data over longer distances and at higher bandwidths than any other networking media. Unlike copper wires, fiber-optic cable can transmit signals with less attenuation and is completely immune to EMI and RFI.



This item references content from the following areas:

ITN

1.4.5 Fiber-Optic Cabling

## 56 Which two functions are performed at the MAC sublayer of the OSI data link layer? (Choose two.)

| Correct<br>Response | Your<br>Response |
|---------------------|------------------|
|---------------------|------------------|

- |   |  |
|---|--|
|  | <input type="checkbox"/> Controls the NIC responsible for sending and receiving data on the physical medium.                       |
|  | <input type="checkbox"/> Implements a trailer to detect transmission errors.   |
|   | <input type="checkbox"/> Enables IPv4 and IPv6 to utilize the same network interface and media.                                    |
|   | <input type="checkbox"/> Adds Layer 2 control information to network protocol data.  |
|   | <input type="checkbox"/> Places information in the frame that identifies which network layer protocol is being used for the frame. |


This item references content from the following areas:

ITN

1.6.1 Purpose of the Data Link Layer

## 66 What action will occur if a switch receives a frame and does have the source MAC address in the MAC table?

| Correct<br>Response | Your<br>Response |
|---------------------|------------------|
|---------------------|------------------|

- |   |  |
|---|--|
|   | <input type="radio"/> The switch sends the frame to a connected router because the destination MAC address is not local. |
|  | <input type="radio"/> The switch refreshes the timer on that entry.  |
|   | <input type="radio"/> The switch does not forward the frame.   |
|   | <input type="radio"/> The switch shares the MAC address table entry with any connected switches.                         |

This item references content from the following areas:

ITN

1.7.2 Ethernet MAC Address