[Question 1]

What is te IOS command to change the MTU (Maximum Transmission Unit) for an

interface on a Cisco router?

1) Enter configuration mode:

configure terminal

2) Select the interface:

interface {{vlan vlan\_ID} | {{type slot/port} | {port-channel port\_channel\_number} slot/port}}

3) Configure the MTU size

a. To configure the system MTU mtu mtu\_size

b. To configure the IP protocol MTU ip mtu mtu\_size

4) Exits configuration mode

end

[Question 2]

How does a router determine whether datagrams to a particular host can be

directly delivered through one of its interfaces?

An IP datagram contains IP header and the destination IP address can be found in the IP header. When routers receive an IP datagram, they will try to match the destination IP address to the entries in the routing table by routing table lookup. If the address is found

A router tries to match up the IP headers of the packets passing by with its routing table entries. If they don't match with any of the entities, the packets will not stay in the network. If they do match with one of the entities, by looking at the routing table, the router gets to know what interface to use to finish this delivery, and then send the packet through that interface.

[Question 3]

Which systems generate ICMP route redirect messages--routers, hosts, or both?

I think ICMP route redirect messages are generated by routers.

If there is a more direct path to send packets from the source host to the

destination host, the router that's sitting in between would send out a ICMP

route redirect message to the source host. This message would inform the source

host to route through another router, which provides a more direct path to that

certain destination host. This is done by the router at the same time when it

correctly sends out the already received packets to the next hop, and from then

on, the packets from this source host to this destination host would not go

through this router any more.

[Question 4]

What is the default maximum TTL value used by traceroute when sending UDP data-

grams?

The default maximum TTL value sending UDP datagrams is 30. If the target is

within this distance, the traceroute would keep trying till finds the target.

If the target is father than 30 hops away, then this value will need to be

increased.

[Question 5]

Describe the role of a default gateway in a routing table.

The default gateway is chosen when an IP address doesn't belong to any other

entities in the routing table. The routing table decides whether the packets

should stay or leave the network. If the packets' IP header doesn't match

any of the other entries of the routing table, then it matches up with the

default gateway, then the packets will be sent out and leave the network

[Question 6]

What is the network prefix of IP address 192.110.50.3/24

The network prefix of this IP address is /24.

[Question 7]

Explain the differece between a network IP address and a network prefix.

The network IP prefix identifies the number of sigificant bits used to idetify

a network. For example, IP address 192.110.50.3/24, means the first 24 bits are

used to represent the network and the remaining 8 bits are used to identify

host.

The network IP address is the IP address network part. Network prefix is the

bit size of the network IP address.

[Question 8]

An orgaization has been assigned the network number 140.25.0.0/16 and it needs

to create networks that support up to 60 hosts on each IP network. What is the

maximum number of networks that can be set up? Expain your answer.

32 - 16 = 16

ceiling [log\_2 60] = 6

16 -6 = 10

2^10 = 1024

ceiling[log\_2 60] = 6 so 6 bits are required for 60 hosts, leaving 10 bits

available for the subnets. 10 bits is enough for 1024 subnets since

2^10 = 1024.

The organizaton can set up a maximum number of 1024 networks with each network

holds up to 60 hosts on the same network.