Network Essentials Chapter 6 Review

Name _____

1. The OSI model has 7 layers. Layer 4 is the Transport .Layer 3 is the Network Layer. Layer 2 is the Data Link Layer and Layer 1 is the Physical Layer.

2. Layer 3 provides services to allow end devices to exchange data across a network. Four basic processes are used : Addressing end devices . Encapsulation . Routing . De-encapsulation.

3. Protocols are needed for communication. Common network layer protocols include IP version 4 (IPv4) and IP version 6 (IPv6). Non-IP protocols are known as Legacy network layer protocols.

4. An IP packet consists of an IP header and a segment after encapsulation.
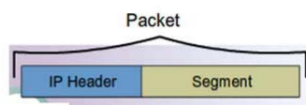
5. Every packet will flow through the internetwork from source to destination device.

6. The IP Network Layer protocol does not guarantee that all packets sent will be delivered to the destination device.

7. At Layer 3, a IP header is added to the Transport Layer PDU (Protocol Data Unit).

8. The IPv4 packet header contains 14 fields; 13 required, 1 optional. Each field has a length of 1 byte

9. IPv6 was introduced to overcome the limits of IPv4. IPv6 offers 340 undecillion IPv6 addresses; 340,000,000,000,000,000,000,000,000,000,000,000,000, while IPv4 offers 4294967296 addresses.

10. There are usually more than one path for a packet to take when sent across a network. Routing is the process of selecting the best paths for data delivery in a network.

11. A routing table is a data table stored in a router or a networked computer. It lists the routes to particular network destinations. The primary function of a router is to forward a packet toward its destination network, which is the destination IP address of the packet. To do this, a router needs to search the routing information stored in its routing table.

12. Hosts must maintain their own local routing table to ensure that network layer packets are directed to the correct destination network. The local table of the host typically contains the following information:
    Direct connection, Local network route , Local default route

13. A device can have 2 types of networks: Directly-connected networks and Remote networks.
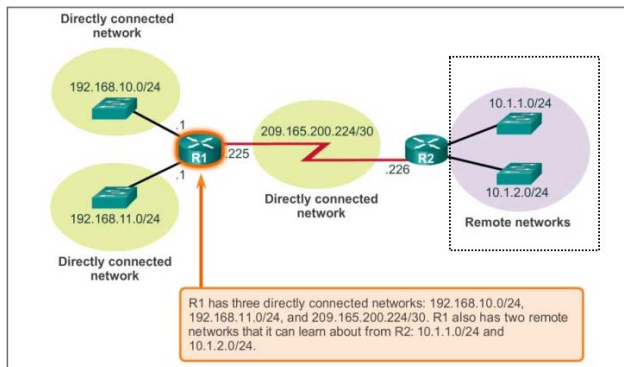
14. **For the notation** 192.168.10.0/24, '192.168.10.0' refers to the IP address, '/24' refers to the subnet 255.255.255.0. The '24' refers to 24 bits.

15. '/16' would translate into 255.255.0.0. The '16' refers to 16 bits.
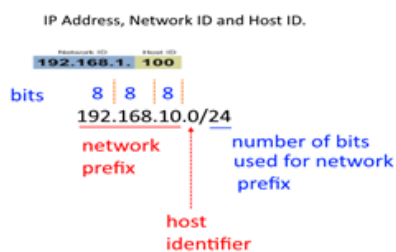
16. 'Next hop' is the next possible destination for a data packet. It is an IP address entry in a router's routing table, which specifies the next closest/most optimal router in its routing path.

ROUTERS

1. A router is a computer with an CPU, OS and memory. There are 4 types of memory used in a router: • RAM • ROM • NVRAM • Flash.

2. Cisco IOS for routers provides the following: ♣ Addressing ♣ Interfaces ♣ Routing ♣ Security ♣ QoS ♣ Resources Management.

3. The version of the IOS used can be checked at the CLI of the router, using the 'show version' command.

4. When a Cisco router is booted for the first time, some basic configuration has already been performed. This is the default configuration. To check the configuration details, we can use the command 'show running-config' at the CLI. It may need to be re-configured to suit the network it is used in.
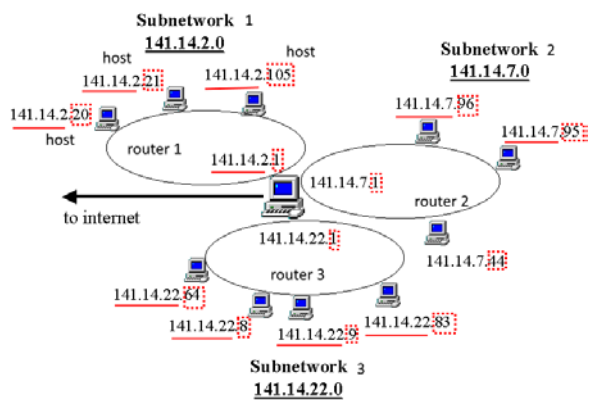
5. Revise the commands used as practised in your PA1 and PA2.

6. Default gateway.
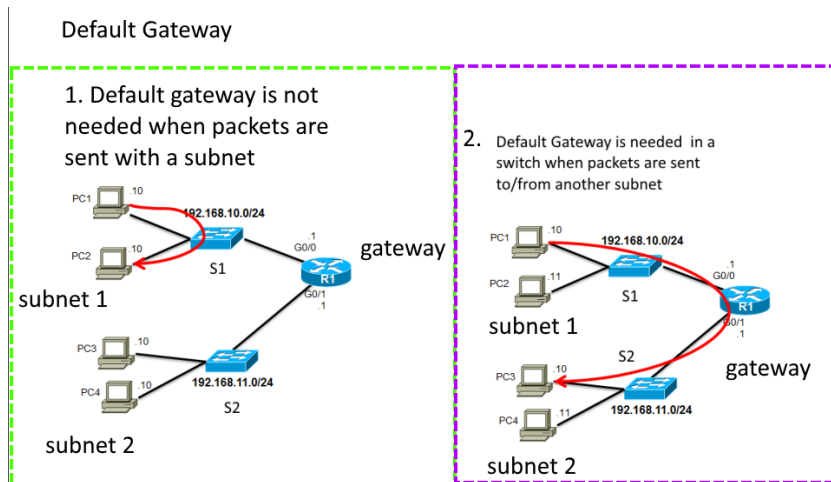
Default Gateway

7. If the default gateway is not configured at S1 (switch), packets from subnet 1 will not be able to reach subnet 2. The command is "ip default gateway <ip address>.

8.

a. How many subnets are there?   3

b. The subnet addresses are:

   _____ _____ _____

c. The respective router IP addresses are

   _____ _____ _____

d. The three host numbers used in subnet 1 are _____.

e. The three host numbers used in subnet 2 are _____.

f. The four host numbers used in subnet 3 are _____.