Ccna- module-2

(1)Ans.IPv4 Range
IPv4 uses 32-bit addresses, ranging from 0.0.0.0 to 255.255.255.255.
Private IPs:
10.0.0.0 to 10.255.255.255
172.16.0.0 to 172.31.255.255
192.168.0.0 to 192.168.255.255

Subnetting Example
Given network 192.168.1.0/24:
/24 allows 256 IPs (usable: 254).
Dividing into /26 creates 4 subnets, each with 64 IPs (usable: 62).

Example Subnet:
1. 192.168.1.0/26
Usable: 192.168.1.1 to 192.168.1.62
Broadcast: 192.168.1.63

(2)Ans.Private IPv4 Address Ranges
1. Class A: 10.0.0.0 to 10.255.255.255
2. Class B: 172.16.0.0 to 172.31.255.255
3. Class C: 192.168.0.0 to 192.168.255.255

(3)Ans.Routing is the process of selecting the best path for data to travel across a network.

How a Router Works:
1. Receives Data Packets
2. Reads Destination Address
3. Checks Routing Table
4. Forwards the Packet

Routing Protocols
Types of Routing Protocols:
1. Static Routing:
Routes are manually configured by the network administrator.
Used in small, stable networks.

2. Dynamic Routing
Examples of dynamic routing protocols:
RIP (Routing Information Protocol): Simple, uses hop count to find the best path.

OSPF (Open Shortest Path First): Calculates the shortest path using link-state information.

Eigrp(Enhanced interior gateway routing protocol):other router collect information

(4)Ans.cisco packet tracker

(5)Ans.Basic Router and Switch Commands
1. Viewing Device Status
show running-config
show startup-config
show ip interface brief
show version
2. Interface Configuration
configure terminatal
interface <interface-id>
ip address <IP-address> <subnet-mask>
no shutdown
Activates the interface (turns it on).
3. Basic Routing Commands
ip route
Creates a static route
4. VLAN Configuration (Switch)
vlan <VLAN-ID>
Creates a new VLAN (e.g., vlan 10).
name <VLAN-name>
Assigns a name to the VLAN (e.g., name SALES).
switchport mode access
Sets the port as an access port for a specific VLAN.
switchport access vlan <VLAN-ID>
5. Saving and Exiting
exit
6. Troubleshooting
ping <destination-IP>
traceroute <destination-IP>
show interfaces

(6)Ans.Types of Routing
1. Static Routing:-
Manually configured routes.
Example-
R1(config)# ip route 192.168.2.0 255.255.255.0 10.0.0.2
2. Dynamic Routing
Routes automatically updated using protocols like RIP, OSPF,eigrp
3. Default Routing
Static Routing Example:
Network 192.168.1.0/24 (R1) to 192.168.2.0/24 (R2) via 10.0.0.0/30.

(7)Ans.Dynamic Routing -
Definition: Routers automatically share
and update routing information.
Common Protocols:
RIP: Uses hop count to find routes.
OSPF: Calculates the shortest path

Eigrp: Used for internet-scale routing.

Advantages:
Automatically adapts to changes.
Suitable for large networks.
Disadvantages:
Complex setup

(8)Ans.RIP vs EIGRP vs OSPF
RIP:- Simple, uses hop count, slow, for small networks.
EIGRP:-Cisco-only, fast, uses bandwidth & delay, for medium networks.
OSPF:- Open standard, very fast, uses cost, for large networks.

(9)Ans.RIP, EIGRP, OSPF Examples
1. RIP (No areas, hop count)
router rip
network 192.168.1.0
network 10.0.0.0
2. EIGRP (No areas, metric: bandwidth & delay)
router eigrp 100
network 192.168.1.0 0.0.0.255
network 10.0.0.0 0.0.0.3
3. OSPF (Uses areas)
router ospf 1
network 192.168.1.0 0.0.0.255 area 0
network 10.0.0.0 0.0.0.3 area 0

(10)Ans.Default Routing
Sends traffic to a default gateway when no specific route exists.
Command:-
ip route 0.0.0.0 0.0.0.0 <next-hop-IP>
Example:-
ip route 0.0.0.0 0.0.0.0 10.0.0.2

(11)Ans.Autonomous System Number (ASN) -
ASN:-Unique ID for a network (Autonomous System) in BGP.
Identifies networks for routing between different ASes.
Range:-
Public: 1-64511
Private: 64512-65535
Example:-AS 65000 represents a specific network in BGP.

(12) Ans.