**📖 Networking Basics – Teaching Flow for Network Engineer**

**Session 1: Introduction to Networking**

* What is a computer network? Why do we need it?
* Real-life examples: Internet, Office LAN, Home Wi-Fi
* **Types of Networks**: LAN, WAN, MAN, PAN, WLAN, VPN
* **Client-Server vs Peer-to-Peer**
* **Exercise**: Ask the candidate to explain how their home Wi-Fi works in terms of a “network.”

**Session 2: Network Models**

* **OSI Model (7 layers)** – explain with examples (Email, Web browsing)
* **TCP/IP Model** – real-world mapping with OSI
* **Encapsulation/Decapsulation** – packet journey from sender to receiver
* **Exercise**: Give an example like “opening google.com” and let them map the layers involved.

**Session 3: IP Addressing & Subnetting**

* IPv4 Basics: Structure, Classes (A, B, C)
* **Public vs Private vs APIPA vs Loopback**
* **Subnet mask & CIDR notation**
* Subnetting basics (very simple exercise, e.g., “How many hosts in /29?”)
* IPv6 basics – why needed
* **Exercise**: Ask them to find their own IP (ipconfig/ifconfig).

**Session 4: Network Devices**

* Hub, Switch, Router – differences
* **L2 vs L3 switch**
* Firewall, Load balancer, IDS/IPS basics
* Real-life analogy: Switch = Post office sorter, Router = Traffic police
* **Exercise**: Ask them to explain how a router in their home connects to ISP.

**Session 5: Switching Concepts**

* MAC addresses
* **VLANs** – why needed, VLAN trunking
* STP (loop prevention basics)
* Port security (preventing rogue devices)
* **Exercise**: Give them a scenario – “Marketing and HR must be on separate VLANs. Why?”

**Session 6: Routing Concepts**

* Routing basics (How routers forward packets)
* **Static vs Dynamic Routing**
* Intro to OSPF, RIP, BGP (just awareness)
* NAT & PAT with real-life ISP example
* **Exercise**: Ask them why NAT is needed when browsing from home.

**Session 7: TCP/IP Protocols**

* ARP (mapping IP ↔ MAC)
* ICMP (ping, traceroute)
* DHCP (auto IP assignment)
* DNS (website name → IP address)
* TCP vs UDP (use cases: HTTP vs VoIP)
* **Exercise**: Use ping google.com and nslookup google.com.

**Session 8: Wireless Networking**

* Wi-Fi Standards (802.11 a/b/g/n/ac/ax)
* SSID, Channels, Interference basics
* WPA2 vs WPA3
* **Exercise**: Ask them to find Wi-Fi security type on their laptop/phone.

**Session 9: Network Security Basics**

* ACLs (filtering traffic)
* Firewall basics (stateful vs stateless)
* VPN (IPSec, SSL VPN – only concepts)
* Common attacks: DoS/DDoS, ARP spoofing
* **Exercise**: Ask – “If an attacker floods a server with traffic, what happens?”

**Session 10: Network Monitoring & Tools**

* Tools: ping, traceroute, ipconfig/ifconfig, netstat, nslookup/dig, tcpdump, Wireshark
* Logs & monitoring: Syslog, SNMP, NetFlow basics
* **Exercise**: Run traceroute google.com and interpret output.

**Session 11: Modern Networking (Cloud/SDN Basics)**

* SD-WAN & SDN (high-level only)
* Load balancing & CDN basics
* Cloud Networking (AWS VPC: Subnets, Route Tables, Security Groups)
* **Exercise**: Ask them how AWS VPC is similar to a corporate network.

**✅ Final Step**

At the end, do a **mock Q&A** where you ask real-world troubleshooting:

* “User cannot access internet but LAN works. What could be the issue?”
* “If DNS is down, what happens when you try to open google.com?”
* “Two PCs in same VLAN can’t communicate. What will you check?”