📘 CCNA Questions & Answers (Beginner → Advanced)

🔷 Section 1 – Networking Fundamentals (Beginner)

Q1. What is a network?
A group of connected devices that share resources and information.

Q2. What are the types of networks?
LAN, WAN, MAN, WLAN, PAN.

Q3. What are the 7 layers of OSI model?
Physical, Data Link, Network, Transport, Session, Presentation, Application.

Q4. What is TCP vs UDP?
TCP = Reliable, connection-oriented. UDP = Fast, connectionless.

Q5. What is a MAC address?
A unique 48-bit hardware address (e.g., 00:1A:2B:3C:4D:5E).

Q6. What is an IP address?
A logical address (IPv4 = 32-bit, IPv6 = 128-bit).

Q7. What are private IP ranges?
10.0.0.0/8, 172.16.0.0/12, 192.168.0.0/16.

Q8. What is a default gateway?
Router IP used to reach outside networks.

https://www.linkedin.com/in/gitesh-d-aa95a8227/

Q9. What is DNS?
Domain Name System – resolves domain names to IPs.

Q10. What is DHCP?
Automatically assigns IP addresses to clients.

🔷 Section 2 – IP Addressing & Subnetting

Q11. What is subnetting?
Dividing a network into smaller subnets.

Q12. Example of subnetting 192.168.1.0/24 into /26?
Creates 4 subnets: 192.168.1.0/26, .64/26, .128/26, .192/26.

Q13. What is CIDR?
Classless Inter-Domain Routing – allows variable subnet masks.

Q14. What is the loopback IP?
127.0.0.1 – used for testing TCP/IP stack.

Q15. What is APIPA?
169.254.x.x – assigned when DHCP unavailable.

Q16. What is difference between public & private IP?
Public = routable on internet. Private = local networks only.

Q17. What is NAT?
Network Address Translation – translates private IPs into public IPs.

Q18. Types of NAT?
Static, Dynamic, PAT (NAT overload).

Q19. What is PAT?
Port Address Translation – many private IPs share one public IP.

Q20. What is IPv6?
128-bit addressing scheme, virtually unlimited addresses.

🔷 Section 3 – Switching (Layer 2)

Q21. What is a switch?
Layer 2 device that forwards frames using MAC addresses.

Q22. What is a VLAN?
Virtual LAN – logically separates devices.

Q23. Benefits of VLAN?
Security, reduces broadcasts, efficiency.

Q24. What is trunking?
Allows multiple VLANs across one link (802.1Q).

Q25. What is VTP?
VLAN Trunking Protocol – manages VLANs across switches.

Q26. What is STP?
Spanning Tree Protocol – prevents switching loops.

Q27. What is RSTP?
Rapid Spanning Tree Protocol – faster convergence.

Q28. What is BPDU?
Bridge Protocol Data Unit – used by STP.

Q29. What is port security?
Limits MAC addresses on a switch port.

Q30. What is EtherChannel?
Bundles multiple links into one logical link.

🔷 Section 4 – Routing (Layer 3)

Q31. What is a router?
Layer 3 device that forwards packets using IP addresses.

Q32. What is static routing?
Manually configured routes.

Q33. What is dynamic routing?
Automatically learned routes.

Q34. What is RIP?
Distance-vector protocol, hop count metric, max 15 hops.

Q35. Difference between RIPv1 and RIPv2?
RIPv1 = classful, no VLSM. RIPv2 = classless, supports VLSM, authentication.

Q36. What is OSPF?
Link-state protocol using cost metric and Dijkstra SPF.

Q37. OSPF packet types?
Hello, DBD, LSR, LSU, LSAck.

Q38. What is EIGRP?
Cisco's hybrid protocol using bandwidth & delay as metrics.

Q39. EIGRP algorithm?
DUAL (Diffusing Update Algorithm).

Q40. What is BGP?
Border Gateway Protocol – exterior routing between ASes.

🔷 Section 5 – WAN Technologies

Q41. What is HDLC?
Default Cisco WAN encapsulation.

Q42. What is PPP?
Point-to-Point Protocol for serial links.

Q43. What is MPLS?
Multiprotocol Label Switching – forwards using labels.

Q44. What is GRE tunnel?
Encapsulation protocol for tunneling traffic.

Q45. What is VPN?
Virtual Private Network – secure tunnel over internet.

Q46. Types of VPN?
Site-to-site, Remote access.

Q47. What is IPsec?
Provides encryption & authentication for VPNs.

Q48. What is DMVPN?
Dynamic Multipoint VPN – scalable VPN for multiple sites.

Q49. What is Metro Ethernet?
Carrier Ethernet used in WAN connectivity.

Q50. What is Frame Relay?
Legacy WAN protocol (replaced by MPLS).

🔷 Section 6 – Security

Q51. What is ACL?
Access Control List – filters traffic.

Q52. Types of ACL?
Standard (source IP), Extended (src/dst/protocol/port).

Q53. What is DHCP snooping?
Prevents rogue DHCP servers.

Q54. What is DAI?
Dynamic ARP Inspection – prevents ARP spoofing.

Q55. What is IPsec?
Encrypts and authenticates IP traffic.

Q56. What is AAA?
Authentication, Authorization, Accounting.

Q57. What is RADIUS?
AAA protocol using UDP.

Q58. What is TACACS+?
Cisco AAA protocol using TCP.

Q59. What is HSRP?
Hot Standby Router Protocol – Cisco redundancy.

Q60. What is VRRP?
Open standard redundancy protocol.

🔷 Section 7 – IPv6

Q61. What are IPv6 address types?
Unicast, Multicast, Anycast.

Q62. What is IPv6 link-local?
FE80::/10, auto-assigned.

Q63. What is SLAAC?
Stateless Address Auto Configuration.

Q64. What is dual-stack?
Running IPv4 & IPv6 together.

Q65. What is IPv6 anycast?
Same address assigned to multiple devices – nearest responds.

Q66. IPv6 multicast range?
FF00::/8.

Q67. IPv6 loopback?
::1.

Q68. IPv6 global unicast?
2000::/3.

Q69. IPv6 unique local?
FC00::/7.

Q70. IPv6 advantages?
Huge address space, built-in IPsec, no broadcasts.

🔷 Section 8 – Advanced Routing & Services

Q71. What is OSPF DR/BDR?
Designated Router & Backup for broadcast networks.

Q72. How is DR elected?
Highest priority, then highest router ID.

Q73. What is redistribution?
Sharing routes between different protocols.

Q74. What is a stub area in OSPF?
Limits LSAs to reduce overhead.

Q75. What is route summarization?
Aggregating multiple networks into one advertisement.

Q76. What is a floating static route?
Backup static route with higher AD.

Q77. What is BGP administrative distance?
20 (external), 200 (internal).

Q78. What is BGP metric?
Path attributes (AS_PATH, LOCAL_PREF, MED).

Q79. What is MPLS label format?
20-bit label, 3-bit EXP, 1-bit S, 8-bit TTL.

Q80. What is QoS?
Quality of Service – prioritizes certain traffic.

🔷 Section 9 – Troubleshooting

Q81. Command to check IP on interfaces?
show ip interface brief.

Q82. Command to check VLANs?
show vlan brief.

Q83. Command to check trunk ports?
show interfaces trunk.

Q84. Command to check routing table?
show ip route.

Q85. Command to check OSPF neighbors?
show ip ospf neighbor.

Q86. Command to check EIGRP neighbors?
show ip eigrp neighbors.

Q87. Command to test connectivity?
ping <ip>.

Q88. Command to trace path?
traceroute <ip>.

Q89. What is CDP?
Cisco Discovery Protocol – finds directly connected Cisco devices.

Q90. What is LLDP?
Vendor-neutral device discovery protocol.

🔷 Section 10 – Exam-Focused & Concepts

Q91. What is NetFlow?
Collects network traffic statistics.

Q92. What is syslog?
Logging protocol for network devices.

Q93. What is NTP?
Network Time Protocol – synchronizes time.

Q94. What is port mirroring (SPAN)?
Copies traffic to another port for monitoring.

Q95. What is CoPP?
Control Plane Policing – protects router CPU.

Q96. What is jumbo frame?
Ethernet frame > 1500 bytes.

Q97. What is policing vs shaping in QoS?
Policing = drops traffic, Shaping = delays traffic.

Q98. What is the difference between data plane and control plane?

Data plane = packet forwarding, Control plane = routing decisions.

Q99. What is convergence?

Time taken for routers to agree on network topology.

Q100. What is the purpose of CCNA certification?

Validates knowledge of networking, routing, switching, security, and troubleshooting.

#Follow for more

Prepared by: Gitesh Dhungana

https://www.linkedin.com/in/gitesh-d-aa95a8227/