

# SPCI102 Exam Study Guide

## Must-Study Questions by Year

- OSI vs TCP/IP Model (Every Year: 2020, 2023)
- Subnetting (Class C/B, with calculation problems): 2020, 2022, 2023
- IPv4 vs IPv6 headers: 2021, 2023
- VLANs and VTP: 2021, 2023
- CIDR and VLSM: 2020, 2021, 2023
- NAT, PAT: 2020, 2021, 2023

## Important

OSI vs TCP/IP (Functions, Layers, Diagrams)

Subnetting (Class B, C, VLSM, CIDR)

Routing Protocols (RIP, OSPF, EIGRP, NAT)

VLAN & VTP (Trunking, Domains)

IPv4/IPv6 Headers, MAC

## 2-Mark (Repeated Questions)

- What is NAT?
- What is CIDR?
- Explain three-way handshake- What is VTP?
- What are DTE and DCE?- What is subnetting?

## 10-Mark Topics

- OSI vs TCP/IP model with diagram
- Subnetting large networks (Class B)
- VLANs and advantages
- Frame Relay, MPLS, Edge Routers

## Unit Wise Questions:

### UNIT 1: OSI & TCP/IP Models

- OSI 7-layer model: Functions and protocol examples per layer
- TCP/IP model and its comparison with OSI
- Encapsulation vs De-encapsulation
- Protocol Data Units (PDU)
- MAC vs IP Addressing

#### Frequently Asked:

- ☒ Compare OSI vs TCP/IP
  - ☒ Explain Encapsulation and De-encapsulation
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### UNIT 2: IP Addressing & Routing

- Classes of IP Addresses (A, B, C, D, E)
- Classful vs Classless Addressing (CIDR)
- Subnetting, VLSM, Wildcard Masks
- Default Gateway and Routing Table
- IP Routing Process & Components
- Special IPs: APIPA, Loopback, Broadcast

#### Frequently Asked:

- ☒ Subnet a Class C IP
  - ☒ Explain CIDR
  - ☒ APIPA purpose and limitations
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### UNIT 3: Routing Protocols

- Static vs Dynamic Routing
- Routing Algorithms & Administrative Distance
- RIP, RIPv1, RIPv2
- EIGRP: Neighbors, Feasible Distance, Topology Table
- OSPF: Areas, Neighbors, LSA, LSU, LSR
- Distance Vector vs Link State

#### Frequently Asked:

- ☒ Difference: DV vs LS protocols
  - ☒ EIGRP terms: Successor, FD
  - ☒ OSPF Area 0 and its importance
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### UNIT 4: VLANs and VTP

- What is VLAN? Benefits and segmentation

- Trunk vs Access Links
- VTP: VLAN Trunking Protocol
- Broadcast and Collision Domains

**Frequently Asked:**

- ☒ VLAN advantages
  - ☒ Difference between Access and Trunk links
  - ☒ Role of VTP
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**UNIT 5: NAT & Advanced IP Concepts**

- NAT: Static, Dynamic, PAT
- IPv4 vs IPv6 Header Structure
- TCP Features: SACK, Timestamp, Three-Way Handshake
- DHCP, DNS
- MAC Address and Cybercrime Tracking

**Frequently Asked:**

- ☒ Static NAT vs PAT
- ☒ IPv4 vs IPv6 headers
- ☒ MAC Address role in network forensics