

## **Essential Networking Topics for SPSC IT Commission Exam**

### **1. Basics of Computer Networks**

- Definition and types of networks (LAN, WAN, MAN, PAN)
- Network topologies (Bus, Star, Ring, Mesh, Hybrid)
- Client-server vs. Peer-to-peer networks

### **2. OSI & TCP/IP Models**

- OSI Model (7 Layers: Physical, Data Link, Network, Transport, Session, Presentation, Application)
- TCP/IP Model (4 Layers: Network Interface, Internet, Transport, Application)
- Protocols used in each layer (e.g., IP, TCP, UDP, HTTP, FTP, etc.)

### **3. Network Protocols & Services**

- **IP Addressing (IPv4 & IPv6)**
- Subnetting and Supernetting
- TCP vs. UDP
- DNS, DHCP, SMTP, POP3, IMAP, HTTP, HTTPS, FTP, Telnet, SSH

### **4. Network Devices**

- Routers, Switches, Hubs, Bridges, Modems, Repeaters
- Difference between L2 & L3 switches
- Wireless Access Points (WAPs)

### **5. Routing & Switching**

- Static vs. Dynamic Routing
- Routing Protocols: RIP, OSPF, EIGRP, BGP
- VLANs (Virtual LANs)
- NAT (Network Address Translation)
- ACLs (Access Control Lists)

### **6. Wireless & Mobile Networks**

- Wi-Fi Standards (802.11 a/b/g/n/ac/ax)
- Bluetooth, NFC, RFID
- Mobile Communication (2G, 3G, 4G, 5G)

### **7. Network Security**

- Firewalls, IDS (Intrusion Detection System), IPS (Intrusion Prevention System)

- VPN (Virtual Private Network)
- Encryption & Cryptography (AES, RSA, Hashing)
- Cyber Threats (Phishing, DDoS, Malware, Ransomware)

## **8. Cloud Computing & Virtualization**

- Cloud models: IaaS, PaaS, SaaS
- Virtualization technologies (VMware, Hyper-V, Docker, Kubernetes)
- SDN (Software-Defined Networking)

## **9. Network Troubleshooting**

- Ping, Traceroute, Netstat, Nslookup
- Packet Sniffing tools (Wireshark, tcpdump)
- Common network issues & solutions

## **10. Internet of Things (IoT) & Emerging Trends**

- Basics of IoT networking
- Edge Computing
- Network Automation & AI-driven networking