COMPUTER NETWORKS – 5 UNIT NOTES

UNIT I : INTRODUCTION TO COMPUTER NETWORKS

- Definition, Goals of Networking

- Types of Networks: LAN, MAN, WAN, PAN

- Network Topologies: Bus, Star, Ring, Mesh, Hybrid

- Devices: Hub, Switch, Router, Bridge, Repeater, Gateway

- Transmission Media: Guided & Unguided

- Switching: Circuit, Packet, Message

UNIT II : OSI & TCP/IP MODELS

- OSI Model: 7 Layers

- TCP/IP Model: 4 Layers

- Protocols: HTTP, FTP, DNS, SMTP, TCP, UDP, IP, ICMP

- OSI vs TCP/IP Comparison

UNIT III : NETWORK LAYER & ROUTING

- Functions: Addressing, Routing, Forwarding

- IPv4, IPv6, Subnetting

- Routing Algorithms: Distance Vector, Link State, Dijkstra

- Routing Protocols: RIP, OSPF, BGP

- Congestion Control: Leaky Bucket, Token Bucket

UNIT IV : TRANSPORT & APPLICATION LAYERS

- Transport Services: Flow, Error, Congestion Control

- TCP: Features, 3-Way Handshake

- UDP: Characteristics

- Application Protocols: HTTP/HTTPS, DNS, FTP, SMTP, IMAP, POP3, SSH

UNIT V : WIRELESS NETWORKS & SECURITY

- Wi-Fi (802.11), Bluetooth, Cellular Networks (4G/5G)

- Mobile IP, Handoff

- Security Goals: CIA, Authentication

- Threats: Malware, Phishing, DDoS, Spoofing

- Mechanisms: Encryption, Firewalls, IDS/IPS, VPN