UNIT 1 – BASICS OF NETWORKS & OSI MODEL

1. Types of networks – LAN, WAN, MAN.
2. Wireless and home networks.
3. Network hardware components.
4. Protocol hierarchies.
5. Design issues for layers.
6. Connection-oriented and connectionless services.
7. Service primitives.
8. Services vs protocols.
9. OSI reference model – layers and functions.
10. TCP/IP reference model.
11. Comparison of OSI and TCP/IP.
12. Critique of OSI model.
13. Critique of TCP/IP model.

UNIT 2 – PHYSICAL LAYER

1. Functions of physical layer.
2. Guided transmission media.
3. Twisted pair cable.
4. Coaxial cable.
5. Fiber optic cable.
6. Wireless transmission.
7. Electromagnetic spectrum.
8. Radio transmission.
9. Microwave transmission.
10. Infrared and millimeter waves.
11. Light wave transmission.
12. Communication satellites.
13. GEO, MEO, LEO satellites.
14. Satellites vs fiber optics.

UNIT 3 – DATA LINK LAYER

1. Functions of data link layer.
2. Error detection techniques.
3. Error correction techniques.

4. Elementary data link protocols.
5. Sliding window protocols.
6. Medium access control sublayer.
7. Multiple access protocols.
8. Ethernet.
9. Wireless LANs.
10. Broadband wireless.
11. Bluetooth.

UNIT 4 – NETWORK & TRANSPORT LAYER

1. Functions of network layer.
2. Routing algorithms.
3. Congestion control algorithms.
4. Functions of transport layer.
5. Elements of transport protocols.
6. TCP – features and services.
7. TCP segment structure.

UNIT 5 – APPLICATION LAYER & SECURITY

1. Application layer functions.
2. Domain Name System (DNS).
3. E-mail architecture.
4. Network security basics.
5. Cryptography concepts.
6. Symmetric key algorithms.
7. Public key algorithms.
8. Digital signatures.