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COMPUTER NETWORKS

# UNIT-1:: Introduction:& Physical Layer

**1.a)** Explain different Network Topologies.

**b)** With neat sketch explain Twisted pair cables.

**2.a)** With a neat diagram explain the OSI reference model in detail? Explain the functions performed in each layer.

**b)** Discuss about unguided transmission media.

**3.a)**Explain different network topologies.

**b)** with a neat diagram explain client and server model.

**4.a)** What are the different types of networks? Explain in detail.

**b)** Compare the OSI and TCP/IP Reference Models.

1. **a)**Draw the TCP/IP reference Model and Explain the functions performed in each layer.

**b)** With relevant diagrams explain point to point links and multi point links.

1. **a)** With neat sketch explain Optical Fiber cables.

**b)** Distinguish Between LAN,WAN and MAN

# UNIT-2:: Data Link Layer

**1.a)** Differentiate between HDLC and PPP.

**b)** Given 110010 data frame and generator polynomial G(x)=*x3* + *x2* + 1, derive the transmitted frame.

**2.a)** Explain Error Correcting and Error Detecting codes.

b) Explain Go-Back- N ARQ protocol using Selective Repeat.

**3.a)** What is high level data link control (HDLC)? Explain HDLC frame format in detail.

**b)** The generator polynomial is *x****3****+x+1*. A sender wants to send data 1001. Generate CRC code.

**4.a)** Describe the stop and wait protocol with neat sketch.

**b)** Explain the CRC error detection technique using generator polynomial *x4+x+1* and data 1101011011.

1. **a)** What is the significance of data link layer? Explain the design issues of data link layer.

**b)** What is the need of Framing? Explain character stuffing and bit stuffing for framing.

1. **a)** Explain about the Elementary data link protocols.

**b)** A bit string, 0111101111101111110, needs to be transmitted at the data link layer. What is the string actually transmitted after bit stuffing?

# UNIT-3:: Media Access Control

**1.a)** Explain in detail the operation of pure ALOHA and slotted ALOHA.

**b)** Explain about the Carrier Sense Multiple Access Protocols

**2.a)** Explain CSMA/CD Protocol in detail.

**b)** Discuss in brief the MAC frame structure for IEEE 802.3

**3.a)** Explain why collision is an issue in a random-access protocol but not in controlled access or channelizing protocols.

**b)** Explain Controlled Access Protocols.

**4.a)** What are the techniques for channelization? and Explain.

**b)** Explain CSMA/CA Protocol in detail.

**5.a)** Explain the categories of Standard Ethernet

**b)** Find the type (Unicast, Multicast or Broadcast) for the following MAC destination addresses are:

(i). 4A:30:10:21:10:1A (ii). 47:20:1B:2E:08:EE (iii). FF:FF:FF:FF:FF:FF

**6. a)** Explain in detail about the Physical layer in the Fast Ethernet

**b)** Explain the categories of Gigabit Ethernet

# UNIT-4 :: Network Layer & Internet Working

**1.a)** Explain Link State Routing with an example.

**b)** How is the Connection - Oriented Services implemented? Explain.

**2.a)** Compare IPV4 and IPV6.

**b)** Explain the Dijkstra’s Shortest Path Routing Algorithm with an example.

**3.a)** Explain Distance Vector routing algorithm with an example

**b)** What are the general principles of congestion control? Explain.

**4.a)** Differentiate Virtual Circuits and Datagram Networks

**b)** List and explain in detail the classes of IPV4 addresses.

**5.a)** Explain Hierarchical routing algorithm with diagram.

**b)** Explain different Traffic Control Algorithms.

**6. a)** Explain the IPV4 Header Format

**b)** Describe Fragmentation in internetworking with neat diagram.

# UNIT-5 :: Transport Layer & Application Layer

**1 a)** Explain the architecture of e-mail using four scenarios.

**b**) Explain the Domain name space.

**2.a)** Explain the architecture of [WWW.](http://WWW/) Discuss client and server side functionality of this architecture.

**b)** Explain the operation of SNMP protocol in detail.

**3.a)** Explain the DNS in internet.

**b)** Explain UDP Internet Transport Protocol.

**4.a)** Compare TCP and UDP

**b)** Differentiate the open loop congestion control and closed loop congestion control.

**5.a**) Explain the TCP header fields in detail.

**b)** Explain in detail three way handshaking for connection establishment in TCP.

**6. a)** Explain Backpressure and choke packet congestion control mechanisms.

**b)** Explain the different Services of user agent in electronic mail system

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