SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

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Subject with	DATA COMMUNICATIONS AND	Course & Branch	B.Tech- CIC	
Code	NETWORKING-23CS1001			
Year & Sem	II B.Tech & II Sem	Regulation	R23	

<u>UNIT-1</u>

Data Communications

1.	a)	What is Data Communications?	[L1] [CO1]	[2M]
	b)	List out the components of DCN.	[L1] [CO1]	[2M]
	c)	Define Protocol.	[L1] [CO1]	[2M]
	d)	What is multiplexing?	[L1] [CO1]	[2M]
	e)	Define switching.	[L1] [CO1]	[2M]
2.	a)	List and explain the components of Data Communications.	[L2] [CO1]	[05 M]
	b)	Describe about categories of communication network.	[L2] [CO1]	[05 M]
3.	a)	Illustrate various types of connections in network.	[L3] [CO1]	[05 M]
	b)	What is topology? Examine various types of Network topology.	[L3] [CO1]	[05 M]
4.		Explain in detail ISO/OSI Reference Model	[L2] [CO1]	[10 M]
5.	a)	Explain about ATM Networks.	[L2] [CO1]	[05 M]
	b)	Define frame relay. Explain steps involved in frame relay.	[L2] [CO1]	[05 M]
6.	a)	Describe various transmission modes in data communication.	[L2] [CO1]	[05 M]
	b)	Define Multiplexing. Explain about analog multiplexing	[L2] [CO1]	[05 M]
7.	a)	Describe about Time Division Multiplexing.	[L2] [CO1]	[05 M]
	b)	List and explain advantages and disadvantages of multiplexing	[L2] [CO1]	[05 M]
8.	a)	Illustrate about Wavelength Division Multiplexing	[L3] [CO1]	[05 M]
	b)	Explain about various types of Guided media in data communication.	[L3] [CO1]	[05 M]
9.	a)	Describe about Coaxial cable.	[L2] [CO1]	[05 M]
	b)	Explain about unguided media in data communication.	[L2] [CO1]	[05 M]
10.	a)	Define switching. Explain process steps involved in switching.	[L2] [CO1]	[05 M]
	b)	Describe about Circuit Switched Networks.	[L2] [CO1]	[05 M]
11.	a)	Examine about Datagram Networks.	[L3] [CO1]	[05 M]
	b)	Illustrate about Virtual Circuit Networks	[L3] [CO1]	[05 M]

<u>UNIT –II</u> Data link layer

1.	a)	What are the design issues occurred in data link layer?	[L1] [CO1]	[02 M]
	b)	Define framing and its types?	[L2] [CO3]	[02 M]
	c)	Illustrate simplest protocol with neat sketch.	[L3] [CO2]	[02 M]
	d)	A pure ALOHA network transmits 200-bit frames on a shared channel of 200	[L1] [CO1]	[02 M]
		kbps. What is the requirement to make this frame collision-free?		
	e)	Compare ALOHA & CSMA/CD Protocol.	[L3] [CO3]	[02 M]
2.	a)	Explain about the services provided by the Data link layer.	[L2] [CO1]	[05 M]
	b)	How different types of errors are detected in Datalink layer?	[L3] [CO2]	[05 M]
3.	a)	Extend the following	[L2] [CO4]	[05 M]
		i) Single parity check		
		ii) Two-dimensional parity check		
	b)	How Cyclic codes are effective in error correction? Explain.	[L1] [CO2]	[05 M]
4.	a)	Which elementary data link protocols are used for noiseless channel	[L2] [CO1]	[05 M]
		transmission? Explain.		
	b)	Explain Stop-and-Wait Automatic Repeat Request Protocol.	[L2] [CO2]	[05 M]
5.	a)	Explain Go-Back-N Automatic Repeat Requests Protocol.	[L1] [CO2]	[05 M]
	b)	Explain Selective Repeat Automatic Repeat Requests Protocol.	[L2] [CO1]	[05 M]
6.	a)	Discuss HDLC Protocol with the elaborative explanation of its frames.	[L3] [CO3]	[05 M]
	b)	Interpret the Point to Point (PPP) protocol with suitable examples.	[L1] [CO2]	[05 M]
7.	a)	Write about Pure ALOHA protocol.	[L2] [CO1]	[05 M]
	b)	A pure ALOHA network transmits 200-bit frames on a shared channel of 200	[L4] [CO2]	[05 M]
		kbps. What is the throughput if the system (all stations together) produces		
		i. 1000 frames per second		
		ii. 500 frames per second		
		iii. 250 frames per second.		
		Note: The frame transmission time is 200/200 kbps or 1 ms.		
8.		Explain about IEEE 802.3 with neat sketch.	[L2] [CO2]	[10 M]
9.		Explain about IEEE 802.11 with neat sketch.	[L2] [CO2]	[10 M]
10.	a)	Explain in detail about Carrier Sense Multiple Access with Collision	[L3] [CO3]	[05 M]
		Detection (CSMA/CD) Protocol.		
	b)	What is Controlled Access Protocol? Explain its various methods.	[L1] [CO2]	[05 M]
11.		Extend the following	[L2] [CO4]	[10 M]
		i) The Frequency-Division Multiple Access (FDMA)		
		ii) Time-Division Multiple Access (TDMA)		
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Network Layer

1	a)	What is Logical address?	[L1] [CO3]	[2M]
	b)	Define Tunnelling.	[L1] [CO3]	[2M]
	c)	Define Address Mapping.	[L1] [CO3]	[2M]
	d)	List the applications of ICMP and IGMP.	[L1] [CO3]	[2M]
	e)	What is packet forwarding?	[L1] [CO3]	[2M]
2	a)	Describe about logical addressing with neat diagram.	[L2] [CO3]	[5M]
	b)	Differentiate physical address and logical address.	[L4] [CO3]	[5M]
3	a)	Illustrate about internetworking.	[L3] [CO3]	[5M]
	b)	Define internetwork addressing. Explain various types of internet work address.	[L2] [CO3]	[5M]
4	a)	What is tunnelling? Explain about steps involved in tunnelling.	[L2] [CO3]	[5M]
	b)	Explain about various types of tunnelling protocols.	[L2] [CO3]	[5M]
5	a)	Illustrate about various protocols for address mapping	[L3] [CO3]	[5M]
	b)	What is ICMP? Explain about header format of ICMP.	[L2] [CO3]	[5M]
6	a)	Describe about IGMP protocol.	[L2] [CO3]	[5M]
	b)	Explain the steps involved in packet forwarding.	[L2] [CO3]	[5M]
7	a)	Describe about techniques involved in packet forwarding.	[L2] [CO3]	[5M]
	b)	Explain the features of unicast routing.	[L2] [CO3]	[5M]
8		Describe about the protocols involved in unicast routing	[L2] [CO3]	[10 M]
9	a)	Illustrate about multicast routing with neat sketch.	[L2] [CO3]	[5M]
	b)	Difference between unicast and multicast routing	[L4] [CO3]	[5 M]
10		$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	[L5] [CO3]	[10 M]
		Find the shortest path distance using Dijkstra algorithm		

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<u>UNIT –IV</u> Transport Layer

1.	a)	What are the services provided by transport layer?	[L1] [CO4]	[02 M]
	b)	List any 3 Difference between UDP and TCP.	[L1] [CO4]	[02 M]
	c)	Draw the TCP header format.	[L1] [CO4]	[02 M]
	d)	What is retransmission policy in congestion control network?	[L1] [CO4]	[02 M]
	e)	What are the two classes of services to define Integrated Services?	[L1] [CO4]	[02 M]
2.		Explain the Services provided to the upper layers in transport layer.	[L2] [CO4]	[10 M]
3.	a)	Describe about Transport Service Primitives.	[L1] [CO4]	[05 M]
	b)	Explain Berkeley sockets with suitable diagram.	[L3] [CO4]	[05 M]
4.	a)	Sketch and explain in detail about User Datagram Protocol (UDP).	[L1] [CO4]	[05 M]
	b)	Illustrate Remote procedure calls in UDP.	[L2] [CO4]	[05 M]
5.	a)	What is Real-Time Transport Protocol? Describe with neat sketch.	[L2] [CO4]	[05 M]
	b)	Explain the TCP protocol with neat sketch.	[L1] [CO4]	[05 M]
6.	a)	Explain about each field of TCP segment header	[L4] [CO4]	[05 M]
	b)	Describe about TCP connection Establishment.	[L1] [CO4]	[05 M]
7.	a)	Explain how data traffic used to reduce congestion in transport layer?	[L3] [CO4]	[05 M]
	b)	Discuss about Open Loop Congestion Control and it types.	[L1] [CO4]	[05 M]
8.	a)	Explain the following in closed loop congestion control.	[L1] [CO4]	[05 M]
		i. Back Pressure		
		ii. Implicit Signaling		
	b)	Explain the following in closed loop congestion control.	[L1] [CO4]	[05 M]
		i. Choke Packet		
		ii. Explicit Signaling		
9.	a)	Explain Leaky bucket algorithm with suitable diagram.	[L3] [CO4]	[05 M]
	b)	Explain Token bucket algorithm with suitable diagram.	[L1] [CO4]	[05 M]
10.	a)	Discuss about Important flow characteristics of the QoS.	[L2] [CO4]	[04 M]
	b)	Explain Resource Reservation Protocol (RSVP).	[L1] [CO4]	[06 M]
11.		What are the models are designed to provide Quality of Service (QoS) in the	[L3] [CO4]	[05 M]
		network? Explain it.		

<u>UNIT V</u>

Application Layer

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1.	a)	What is the role of DNS in the Internet?	[L1] [CO5]	[02 M]
	b)	Differentiate between HTTP and HTTPS.	[L4] [CO5]	[02 M]
	c)	State any two differences between IPv4 and IPv6.	[L1] [CO5]	[02 M]
	d)	What is the purpose of flow control in data communication?	[L1] [CO5]	[02 M]
	e)	List two major differences between TCP and UDP.	[L1] [CO6]	[02 M]
2.	a)	Explain the hierarchical structure of the Domain Name System (DNS) and the role of different servers.	[L2] [CO5]	[05 M]
	b)	Explain the working of SMTP and how it helps in email transmission.	[L2] [CO6]	[05 M]
3.	a)	Describe the functions and components of an email system, including SMTP, POP3, and IMAP.	[L2] [CO6]	[05 M]
	b)	What are the steps involved in an FTP session? Explain active and passive modes.	[L2] [CO6]	[05 M]
4.	a)	Illustrate the architecture of the World Wide Web and the role of HTTP.	[L3] [CO3]	[05 M]
	b)	Explain the difference between FTP and HTTP in terms of connection establishment and data transfer	[L2] [CO6]	[05 M]
5.	a)	Explain the basic operations of SNMP. What are the components involved in SNMP-based communication?	[L2] [CO6]	[05 M]
	b)	Compare the OSI and TCP/IP models. Highlight the similarities and differences.	[L4] [CO6]	[05 M]
6.	a)	Explain Ethernet (IEEE 802.3) in detail, including frame format and operation.	[L2] [CO5]	[05 M]
	b)	Differentiate between standard Ethernet, Fast Ethernet, and Gigabit Ethernet.	[L4] [CO4]	[05 M]
7.	a)	Describe Stop-and-Wait ARQ and Sliding Window Protocol with examples.	[L2] [CO5]	[05 M]
	b)	Explain error detection using CRC and checksum.	[L2] [CO5]	[05 M]
8.		Explain Virtual Circuit and Datagram Packet Switching. Give examples of protocols that use them.	[L2] [CO5]	[10 M]
9.	a)	Describe the working of Distance Vector and Link State Routing Algorithms with diagrams.	[L2] [CO5]	[05 M]
	b)	Explain the concept of sockets in networking. How are they used for communication in TCP/UDP?	[L2] [CO6]	[05 M]
10.	a)	Describe how congestion control is implemented in TCP. Include concepts of slow start and congestion avoidance.	[L2] [CO6]	[05 M]
	b)	Explain the IEEE 802.11 architecture and the process of association with an access point.	[L2] [CO6]	[05 M]
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