Course Code: 18EC0451 **R18**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
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Subject with Code: Data Communication & Networking (18EC0414) **Course & Branch**: B.Tech – ECE

Regulation: R18

Year & Sem: III-B.Tech. & II-Sem.

UNIT –I

INTRODUCTION TO DATA COMMUNICATION AND NETWORKS

1	**a**	List the different network criteria)	[L1][CO1]	**[2M]**
	b	Why are protocols needed?	[L3][CO1]	**[2M]**
	c	List out the advantages of star topology.	[L1][CO1]	**[2M]**
	d	In what way you can summarize the purpose of layering.	[L2][CO1]	**[2M]**
	e	Can you discriminate bandwidth and latency? Justify	[L5][CO1]	**[2M]**
2		a) What is Data Communication network and explain its characteristics? b) Name the components of Data communication network. Explain different Data flow for Data communication networks.	[L1][CO1] [L2][CO1]	**[4M]** **[6M]**
3		a) Explain the various forms in which data's can be represented? b) Describe the working of various topologies with its advantages and disadvantages.	[L2][CO1] [L2][CO1]	**[3M]** **[7M]**
4		a) Explain different types of area of Networks. b) Write about Protocol and Standards.	[L2][CO1] [L1][CO1]	**[5M]** **[5M]**
5		a) Discuss the principle of Protocol layering. b) Give comparison between LAN, MAN, WAN.	[L3][CO1] [L4][CO1]	**[5M]** **[5M]**
6		a) What is Switching? Where switching techniques are applicable? b) Write short note on circuit switching, packet switching & message switching.	[L1][CO1] [L2][CO1]	**[4M]** **[6M]**
7		a) Discuss the features of Data link layer. b) Write brief note on the error control techniques.	[L3][CO1] [L2][CO1]	**[3M]** **[7M]**
8		Draw the OSI network architecture and explain the functionalities of each layer in detail.	[L2][CO1]	**[10M]**
9		a) Write brief note on the concept of framing. b) Explain bit stuffing and byte stuffing with an example.	[L2][CO1] [L2][CO1]	**[5M]** **[5M]**
10		a) What is MAC & IP address? Give comparison in between MAC & IP address. b) What are the responsibilities of network layer in OSI models?	[L1][CO1] [L1][CO1]	**[5M]** **[5M]**
11		a) Explain encapsulation and decapsulation methods for OSI layers. b) Write brief note on the flow control techniques.	[L2][CO1] [L2][CO1]	**[5M]** **[5M]**

UNIT –II

COMPUTER NETWORKS

1	**a**	Define hidden node problem.	[L1][CO2]	**[2M]**

	b	Justify the need of Basic service set (BSS) and Extended service set(ESS)	[L5][CO2]	**[2M]**
	c	What is scatternet?	[L1][CO2]	**[2M]**
	d	Examine the access method used by wired Lan and Wireless Lan.	[L4][CO2]	**[2M]**
	e	List out the different standards of Wired Lan.	[L1][CO2]	**[2M]**
2	a) Draw the frame format of a Token and explain. b) Discuss the features & write down the classifications of wired LANs.		[L3][CO2] [L3][CO2]	**[4M]** **[6M]**
3	a) Define Ethernet in wired LANs. Write down the name of different generations of Ethernet. b) Sketch a diagram of Ethernet frame & explain all the parts.		[L1][CO2] [L2][CO2]	**[5M]** **[5M]**
4	a) Explain addressing method for Ethernet. b) Define the type of the following destination addresses. i) 4A:30:10:21:10:1A ii) 47:20:1B:2E:08:EE iii) FF:FF:FF:FF:FF:FF		[L2][CO2] [L5][CO2]	**[4M]** **[6M]**
5	a) Illustrate the working of CSMA/CD protocol with necessary diagrams. b) Discuss about the working of Token Ring.		[L4][CO2] [L3][CO2]	**[6M]** **[4M]**
6	a) Illustrate the working of CSMA/CA protocol with necessary diagrams. b) What are the advantages of using a virtual LAN?		[L3][CO2] [L1][CO2]	**[6M]** **[4M]**
7	a) Describe Token passing in controlled access. b) What is FDDI? Compare FDDI with Token passing.		[L3][CO2] [L1][CO2]	**[5M]** **[5M]**
8	a) Discuss about the working and performance of Token Bus protocol. b) Draw the frame format for Token Bus and explain.		[L2][CO2] [L2][CO2]	**[5M]** **[5M]**
9	a) Write about the architecture of a Bluetooth network. b) Analyze the different layers in a Bluetooth network.		[L1][CO2] [L4][CO2]	**[5M]** **[5M]**
10	a) Explain the services of WiMAX. b) Draw a WiMAX frame & define all the parts.		[L2][CO2] [L2][CO2]	**[5M]** **[5M]**
11	Write short notes on i) Cellular telephony ii) Satellite Networks		[L1][CO2]	**[10M]**

UNIT –III
TCP/IP

1	**a**	How would you design Class A, Class B and Class C of IP.	[L1][CO3]	**[2M]**
	b	Demonstrate the need for subnetting.	[L2][CO3]	**[2M]**
	c	Expand ICMP and write the function	[L2][CO3]	**[2M]**
	d	Determine the mechanisms used for transition for IPv6 to IPv4 address.	[L5][CO3]	**[2M]**
	e	Choose the class of the following IP address: a) 110.34.56.45 b) 212.208.63.23	[L6][CO3]	**[2M]**
2	a) Define TCP/IP layering. b) Explain how it is differing from OSI model?		[L1][CO3] [L3][CO3]	**[5M]** **[5M]**
3	a) Describe logical & physical addressing for TCP/IP model. b) Write a short note on address mapping.		[L2][CO3] [L2][CO3]	**[4M]** **[6M]**
4	Explain IP Datagram format with proper diagram.		[L2][CO3]	**[10M]**
5	a) What is subnet addressing & subnet mask? b) Draw the frame format of IPv4 and explain each field of it		[L1][CO3] [L3][CO3]	**[4M]** **[6M]**
6	a) Define the dotted decimal notation in IP with example. b) Describe in detail the working of ICMP protocol.		[L1][CO3] [L2][CO3]	**[4M]** **[6M]**
7	a) Write the classifications of IPv4 address & define them. b) Compare classful addressing and classless addressing.		[L2][CO3] [L4][CO3]	**[6M]** **[4M]**
8	a) Write the addressing of IPv6. b) Draw a packet format for IPv6 protocol & define all the terms.		[L1][CO3] [L2][CO3]	**[4M]** **[6M]**
9	a) Give a comparison for IPv4 & IPv6 Protocol. b) An organization is granted a block of addresses with the beginning address 14.24.74.0/24. The organization needs to have 3 subblocks of addresses to use in its three subnets: one subblock of 10 addresses, one sub block of 60 addresses, and one subblock of 120 addresses. Design the subblocks.		[L4][CO3] [L4][CO3]	**[5M]** **[5M]**
10	a) Describe in detail the working of ARP protocol. b) Describe in detail the working of RARP protocol.		[L2][CO3] [L2][CO3]	**[5M]** **[5M]**
11	a) Discuss the features of TCP. b) Explain the segment format for TCP.		[L2][CO3] [L2][CO3]	**[5M]** **[5M]**

UNIT –IV
COMMUNICATION PROTOCOLS

1	a	What is the purpose of Domain Name System?	[L1][CO4]	**[2M]**
	b	What is the difference between a user agent (UA) and a mail transfer agent?	[L1][CO4]	**[2M]**
	c	Why is an application such as POP needed for electronic messaging?	[L4][CO4]	**[2M]**
	d	Differentiate IMAP and POP.	[L1][CO4]	**[2M]**
	e	How would you discover MIME types and subtypes?	[L1][CO4]	**[2M]**
2	a) Explain DNS with reference to its components and working. b) Explain the message transfer using simple mail transfer protocol.		[L2][CO4] [L2][CO4]	**[5M]** **[5M]**
3	a) Explain the final delivery of email to the end user using pop3. b) Write short notes on email services of the application layer.		[L2][CO4] [L1][CO4]	**[5M]** **[5M]**
4	Explain the architecture and services of e-mailing system.		[L2][CO4]	**[10M]**
5	a) With a relevant example, discuss how the domain space is divided. b) Distinguish between a fully qualified domain name and a partially qualified domain name. Give relevant example		[L2][CO4] [L3][CO4]	**[5M]** **[5M]**
6	Discuss how simple mail transfer protocol (SMTP) works? Can multimedia messages be transmitted using SMTP? Discuss.		[L2][CO4]	**[10M]**
7	a) Write short notes on FTP. b) Examine how SMTP transfers message from one host to another with suitable illustration.		[L2][CO4] [L4][CO4]	**[5M]** **[5M]**
8	a) Assess IMAP with its state transition diagram. b) Infer the functions performed by DNS. Give example.		[L3][CO4] [L3][CO4]	**[5M]** **[5M]**
9	a) Discuss the working of frame relay. b) Describe the architecture of ATM.		[L2][CO4] [L2][CO4]	**[5M]** **[5M]**
10	a) Describe the characteristics of ATM. . b) Explain about ports and sockets in communication protocol.		[L2][CO4] [L2][CO4]	**[5M]** **[5M]**
11	Briefly describe the issues involved in using ATM technology in LANS.		[L3][CO4]	**[10M]**

UNIT –V
INTERNET DEVICES AND PROTOCOLS

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1	a	How the internet can be accessed by using cable?	[L1][CO5]	**[2M]**
	b	What is Network Security?	[L1][CO5]	**[2M]**
	c	Write the applications of Modem?	[L1][CO5]	**[2M]**
	d	Explain the types of Bridges?	[L1][CO5]	**[2M]**
	e	Explain the need of using internet devices and Protocols?	[L1][CO5]	**[2M]**
2	Explain the typical dial-up connection between a home user and an ISP.		[L5][CO5]	**[10M]**
3	a) What are SLIP and PPP? b) Compare SLIP and PPP.		[L1][CO5] [L4][CO5]	**[5M]** **[5M]**
4	a) What is a leased line? What purpose does it serve? b) Explain the need and the concept of internetworking.		[L1][CO5] [L5][CO5]	**[5M]** **[5M]**
5	Write short notes on 1. Connecting devices 2. Routers		[L1][CO5]	**[10M]**
6	a) Explain briefly about the working of Modem. b) Discuss the applications of modem.		[L1][CO5] [L2][CO5]	**[5M]** **[5M]**
7	a) Discuss about the basic threats in network security. b) Explain in detail about the firewall.		[L1][CO5] [L5][CO5]	**[5M]** **[5M]**
8	a) Compare bridges gateways and switches. b) Describe the requirements of DSL.		[L2][CO5] [L5][CO5]	**[5M]** **[5M]**
9	Discuss in detail 1. Bridges 2. Gateways		[L5][CO5]	**[10M]**
10	a) Discuss the two DSL standards. b) Discuss the types and basics of MODEM.		[L5][CO5] [L6][CO5]	**[5M]** **[5M]**
11	Explain the different ways of accessing the internet?		[L1][CO5]	**[10M]**

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