Course Code: 25MC9113 **R25**

SIDDHARTH GROUP OF INSTITUTIONS:: PUTTUR (AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: COMPUTER NETWORKS (25MC9113) **Course & Branch: MCA**

Year & Sem: I-MCA & II-Sem **Regulation: R25**

UNIT –I

Computer Networks and the Internet

1	**a)**	Explain the components of the Internet with a neat diagram.	**[L2][CO1]**	**[6M]**
	b)	Describe the functions of the network edge.	**[L1][CO1]**	**[6M]**
2		Describe the TCP/IP model, explaining the functionality of each layer with neat sketch.	**[L1][CO1]**	**[12M]**
3	**a)**	Explain the TCP/IP protocol stack and its layers.	**[L2][CO1]**	**[6M]**
	b)	Explain the role of the network core in data communication.	**[L2][CO1]**	**[6M]**
4	**a)**	Compare packet switching and circuit switching.	**[L2][CO1]**	**[6M]**
	b)	Explain different types of delays in packet-switched networks.	**[L2][CO1]**	**[6M]**
5	**a)**	Discuss the causes of packet loss in a network.	**[L2][CO1]**	**[6M]**
	b)	Explain throughput and the factors affecting it.	**[L2][CO1]**	**[6M]**
6		Explain different types of attacks on networks with suitable examples.	**[L2][CO1]**	**[12M]**
7	**a)**	Write a short note on ARPANET with example.	**[L2][CO1]**	**[6M]**
	b)	Explain how the Internet has changed over time.	**[L2][CO1]**	**[6M]**
8		Define the following (i)Packet switching (ii) Circuit switching (iii) Protocol	**[L1][CO1]**	**[12M]**
9		Define the following (i) Transmission delay (ii) Propagation delay (iii) Packet loss	**[L2][CO1]**	**[12M]**
10	**a)**	What is meant by best-effort service?	**[L1][CO1]**	**[6M]**
	b)	What is a Denial of Service (DoS) attack?	**[L1][CO1]**	**[6M]**

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UNIT –II

Application Layer

1	**a)**	Explain the principles of network applications.	**[L2][CO2]**	**[6M]**
	b)	Describe client–server and peer-to-peer architectures.	**[L1][CO2]**	**[6M]**
2	**a)**	Explain the working of the World Wide Web.	**[L2][CO2]**	**[6M]**
	b)	Explain HTTP request and response messages.	**[L2][CO2]**	**[6M]**
3	**a)**	Differentiate between persistent and non-persistent HTTP.	**[L3][CO2]**	**[6M]**
	b)	Explain the working of FTP with a neat diagram.	**[L2][CO2]**	**[6M]**
4	**a)**	Discuss the advantages and limitations of FTP.	**[L2][CO2]**	**[6M]**
	b)	Explain the architecture of an e-mail system.	**[L2][CO2]**	**[6M]**
5		Describe the World Wide Web and HTTP protocol, including message formats.	**[L1][CO2]**	**[12M]**
6	**a)**	Describe SMTP and its role in electronic mail.	**[L1][CO2]**	**[6M]**
	b)	Compare POP3 and IMAP.	**[L2][CO2]**	**[6M]**
7		Explain the File Transfer Protocol with architecture, operation, and advantages.	**[L2][CO2]**	**[12M]**
8	**a)**	Explain the role of DNS in the Internet with example.	**[L2][CO2]**	**[6M]**
	b)	Describe the DNS name resolution process.	**[L1][CO2]**	**[6M]**
9		Explain the Domain Name System , its services, and working in detail.	**[L2][CO2]**	**[12M]**
10		Compare client–server and peer-to-peer architectures with suitable examples.	**[L2][CO2]**	**[12M]**

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UNIT –III

Transport Layer

1	**a)**	Explain the services provided by the transport layer.	**[L2][CO3]**	**[6M]**
	b)	Describe multiplexing and de-multiplexing with examples.	**[L1][CO3]**	**[6M]**
2	**a)**	Discuss the advantages and limitations of UDP.	**[L2][CO3]**	**[6M]**
	b)	Describe stop-and-wait ARQ protocol with diagram.	**[L1][CO3]**	**[6M]**
3	**a)**	Explain Go-Back-N ARQ protocol with diagram.	**[L2][CO3]**	**[6M]**
	b)	Explain Selective Repeat ARQ protocol.	**[L2][CO3]**	**[6M]**
4		Describe multiplexing and de-multiplexing in the transport layer with suitable diagram.	**[L1][CO3]**	**[12M]**
5	**a)**	Explain TCP segment structure with example.	**[L2][CO3]**	**[6M]**
	b)	Explain TCP connection establishment and termination.	**[L2][CO3]**	**[6M]**
6	**a)**	Explain transport-layer services and protocols in detail.	**[L2][CO3]**	**[6M]**
	b)	Discuss the principles of reliable data transfer, explaining different ARQ mechanisms.	**[L2][CO3]**	**[6M]**
7	**a)**	Explain flow control and congestion control in TCP.	**[L2][CO3]**	**[6M]**
	b)	Explain TCP congestion control algorithms.	**[L2][CO3]**	**[6M]**
8		Discuss the principles of congestion control in packet-switched networks.	**[L2][CO3]**	**[12M]**
9	**a)**	Explain RTT estimation and timeout calculation in TCP.	**[L2][CO3]**	**[6M]**
	b)	What is meant by timeout in TCP?	**[L1][CO3]**	**[6M]**
10		Define the following (i) fast retransmit (ii) fast recovery (iii) AIMD	**[L2][CO3]**	**[12M]**

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UNIT –IV

The Network Layer

1	**a)**	Explain the responsibilities of the network layer.	**[L2][CO4]**	**[6M]**
	b)	Describe virtual circuit networks with examples.	**[L1][CO4]**	**[6M]**
2	**a)**	Explain datagram networks and their characteristics.	**[L2][CO4]**	**[6M]**
	b)	Compare virtual circuit and datagram networks.	**[L2][CO4]**	**[6M]**
3	**a)**	Explain IP addressing and its classes with example.	**[L2][CO4]**	**[6M]**
	b)	Describe subnetting with an example.	**[L1][CO4]**	**[6M]**
4		Define the following (i) broadcast routing (ii) multicast routing	**[L2][CO4]**	**[12M]**
5		Explain the Internet Protocol and its role in the Internet with diagram.	**[L2][CO4]**	**[12M]**
6	**a)**	Explain CIDR and its advantages with example.	**[L2][CO4]**	**[6M]**
	b)	Describe IP forwarding mechanism with diagram.	**[L1][CO4]**	**[6M]**
7	**a)**	Explain the structure of an IP datagram with example.	**[L2][CO4]**	**[6M]**
	b)	Explain distance-vector routing algorithm.	**[L2][CO4]**	**[6M]**
8	**a)**	Describe intra-domain and inter-domain routing.	**[L1][CO4]**	**[6M]**
	b)	Explain link-state routing algorithm with a suitable example.	**[L2][CO4]**	**[6M]**
9		Describe broadcast routing techniques used in packet-switched networks.	**[L1][CO4]**	**[12M]**
10		Explain multicast routing, including IGMP and reverse path forwarding.	**[L2][CO4]**	**[12M]**

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UNIT –V

The Link Layer: Links, Access Networks, and LANs

1	**a)**	Describe ALOHA and slotted ALOHA protocols.	**[L1][CO5]**	**[6M]**
	b)	Explain error-detection techniques used in data communication.	**[L2][CO5]**	**[6M]**
2	**a)**	Explain error-correction techniques with examples.	**[L2][CO5]**	**[6M]**
	b)	What is Cyclic Redundancy Check?	**[L1][CO5]**	**[6M]**
3	**a)**	Compare parity check, checksum, and CRC.	**[L2][CO5]**	**[6M]**
	b)	Describe framing techniques used in the link layer.	**[L1][CO6]**	**[6M]**
4	**a)**	Explain the working of Ethernet switches.	**[L2][CO6]**	**[6M]**
	b)	State the main services provided by the link layer.	**[L1][CO6]**	**[6M]**
5	**a)**	Explain the design and challenges of data centre networking.	**[L2][CO6]**	**[6M]**
	b)	Discuss MPLS architecture and operation in detail.	**[L2][CO5]**	**[6M]**
6		Define the following (i) frame and framing (ii) error detection and correction.	**[L2][CO6]**	**[12M]**
7		Explain multiple access links and protocols, comparing ALOHA, CSMA/CD, and CSMA/CA.	**[L2][CO6]**	**[12M]**
8		Describe switched Local Area Networks, explaining Ethernet switching and ARP.	**[L1][CO6]**	**[12M]**
9		Describe data centre network topologies and traffic patterns with example.	**[L1][CO6]**	**[12M]**
10	**a)**	Describe the architecture of switched Local Area Networks.	**[L1][CO6]**	**[6M]**
	b)	Describe the sequence of events in a web page request.	**[L1][CO6]**	**[6M]**

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