SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur–603 203

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

QUESTION BANK

V SEMESTER

CS3561-Computer Networks

Regulation–2023

Academic Year 2025–26 (Odd Semester)

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6. Compare OSI and TCP/IP models. [BTL 2]

7. What is a socket? [BTL 1]

8. [illegible]3TL 1]

9. [illegible]f signals. [BTL 2]

10. [illegible]g and digital transmission? [BTL 1]

11. What is the use of bandwidth? [BTL 1]

12. Define throughput and latency. [BTL 1]

13. What is propagation delay? [BTL 1]

14. List different transmission media. [BTL 1]

15. Distinguish between guided and unguided media. [BTL 2]

16. What is fiber optic cable? [BTL 1]

17. Define attenuation. [BTL 1]

18. What are the roles of repeaters? [BTL 2]

19. Define modem. [BTL 1]

20. What is multiplexing? [BTL 2]

21. State any two functions of physical layer. [BTL 1]

22. Define cross talk. [BTL 1]

23. What are network interconnecting devices? [BTL 1]

24. Define bit rate. [BTL 1]

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QUESTION BANK

SUBJECT: CS3561-Computer Networks

SEM / YEAR: V/ III

UNIT I
INTRODUCTION AND PHYSICAL LAYER

Data Communication - Networks - Network Types - Protocol Layering - TCP/IP Protocol suite - OSI Model - Introduction to Sockets - Physical Layer: Data and Signals - Performance Transmission media- Interconnecting Devices.

PART– A

Q.No	Questions	BT Level	Competence
1.	Define data communication.	BTL 1	Remember
2.	What are the components of a data communication system?	BTL1	Remember
3.	Differentiate between LAN and WAN.	BTL2	Understand
4.	What is the purpose of protocol layering?	BTL2	Understand
5.	List the layers in the OSI model.	BTL1	Remember
6.	Compare OSI and TCP/IP models.	BTL2	Understand
7.	What is a socket?	BTL1	Remember
8.	Define signal.	BTL1	Remember
9.	Classify types of signals.	BTL2	Understand
10.	What is analog and digital transmission?	BTL1	Remember
11.	What is the use of bandwidth?	BTL1	Remember
12.	Define throughput and latency.	BTL1	Remember
13.	What is propagation delay?	BTL1	Remember
14.	List different transmission media.	BTL1	Remember
15.	Distinguish between guided and unguided media.	BTL2	Understand
16.	What is fiber optic cable?	BTL1	Remember

17.	Define attenuation.	BTL1	Remember
18.	What are the roles of repeaters?	BTL2	Understand
19.	Define modem.	BTL1	Remember
20.	What is multiplexing?	BTL2	Understand
21.	State any two functions of physical layer.	BTL1	Remember
22.	What is point-point link?	BTL 2	Understand
23.	What are network interconnecting devices?	BTL1	Remember
24.	Define bit rate.	BTL1	Remember
	PART-B		
1.	Explain OSI reference model with a neat diagram. (16)	BTL4	Analyze
2.	Compare OSI and TCP/IP protocol suites. (16)	BTL5	Evaluate
3.	Describe components of data communication system. (16)	BTL4	Analyze
4.	Explain various types of networks. (16)	BTL4	Analyze
5.	Discuss protocol layering principles. (16)	BTL4	Analyze
6.	Describe socket interface with example. (16)	BTL5	Evaluate
7.	Explain analog and digital signals with diagrams. (16)	BTL5	Evaluate
8.	Describe signal transmission and encoding schemes. (16)	BTL5	Evaluate
9.	Analyze the impact of bandwidth and latency on performance. (16)	BTL5	Evaluate
10.	Describe various transmission media with characteristics. (16)	BTL4	Analyze
11.	Compare coaxial cable, twisted pair and optical fiber. (16)	BTL5	Evaluate
12.	Describe guided and unguided media with diagrams. (16)	BTL4	Analyze
13.	Describe in detail about interconnecting devices like hub, switch, router. (16)	BTL4	Analyze
14.	Explain throughput, delay and jitter with examples. (16)	BTL5	Evaluate
15.	Explain in detail about TCP/IP protocol suite with neat diagram. (16)	BTL3	Apply

16.	What is network topology? Explain the different network topologies. (16)	BTL4	Analyze
17.	(i).Estimate your idea on how guided media differ from unguided media? (8) (ii).Briefly explain communication using guided media and two methods used for data communication using unguided media. (8)	BTL5	Evaluate

UNIT II
DATA LINK LAYER AND SERVICE

Data Link Layer - Framing - Flow control - Error control- Address resolution Protocols: ARP-RARP- Data-Link Layer Protocols - HDLC - PPP - Media Access Control - Ethernet Basics - CSMA/CD - Virtual LAN - Wireless LAN- Switching : Packet Switching- Circuit switching

PART-A

Q.No	Questions	BT Level	Competence
1.	What is framing in data link layer?	BTL 1	Remember
2.	Define error control.	BTL 1	Remember
3.	What is flow control?	BTL 1	Remember
4.	List any two framing techniques.	BTL 1	Remember
5.	What are the services provided by the data link layer?	BTL 1	Remember
6.	Differentiate between stop-and-wait and sliding window protocol.	BTL 2	Understand
7.	What is piggybacking?	BTL 1	Remember
8.	What are the different types of errors in data communication?	BTL 1	Remember
9.	Define ARP and RARP.	BTL 1	Remember
10.	What is the purpose of ARP?	BTL 1	Remember
11.	What is the difference between HDLC and PPP?	BTL 2	Understand
12.	List the types of frames in HDLC.	BTL 1	Remember
13.	What is a MAC address?	BTL 1	Remember
14.	Define CSMA/CD.	BTL 1	Remember
15.	What is media access control?	BTL 1	Remember
16.	Compare ALOHA and CSMA.	BTL 2	Understand
17.	What is Ethernet?	BTL 1	Remember
18.	Define VLAN.	BTL 1	Remember
19.	What is a broadcast domain?	BTL 2	Understand
20.	What is a collision domain?	BTL 2	Understand
21.	Define wireless LAN.	BTL 1	Remember
22.	List the advantages of switching.	BTL 1	Remember
23.	Differentiate packet switching and circuit switching.	BTL 2	Understand
24.	What is switching fabric?	BTL 1	Remember

PART-B

1.	Explain framing, error control, and flow control mechanisms. (16)	BTL4	Analyze
2	Describe ARP and RARP with message formats. (16)	BTL 4	Analyze
3	Explain stop-and-wait and sliding window protocols with examples . (16)	BTL 5	Evaluate

4	Compare and contrast HDLC and PPP in detail. (16)	BTL 5	Evaluate
5	Explain media access control techniques in detail. (16)	BTL 4	Analyze
6	Describe CSMA/CD with diagram and operation. (16)	BTL 5	Evaluate
7	Explain the basics of Ethernet and its frame format. (16)	BTL 4	Analyze
8	Describe the concept of Virtual LAN with example. (16)	BTL 4	Analyze
9	Write short notes on wireless LAN technologies. (16)	BTL 4	Analyze
10	Explain switching techniques with neat diagrams. (16)	BTL 5	Evaluate
11	Describe packet switching in detail. (16)	BTL 4	Analyze
12	Compare circuit switching and packet switching. (16)	BTL 5	Evaluate
13	Explain different types of switching with examples. (16)	BTL 5	Evaluate
14	Describe the data link layer design issues.	BTL 4	Analyze
15	i).Write in detail about error detection techniques like CRC and checksum. (8) ii). Explain Cyclic Redundancy Check? Suppose we want to transmit the message 11001001 and protect it from errors using the CRC polynomial x3 + 1. Use polynomial long division to determine the message that should be transmitted. (8)	BTL 5	Evaluate
16	Explain the MAC sublayer and its responsibilities. (16)	BTL 5	Evaluate
17	Analyze the performance of different MAC protocols (16)	BTL 6	Create

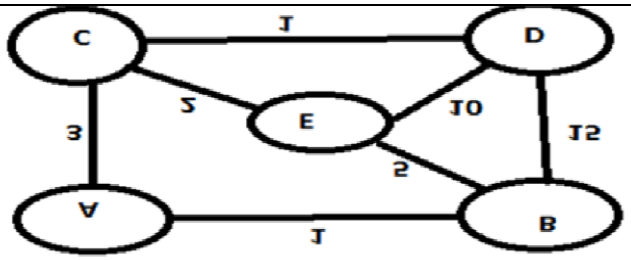
UNIT - III: NETWORK LAYER AND ROUTING

Internet protocol - IPV4 - IP Addressing - Subnetting - ICMP, DHCP -IPV6- Routing and protocols: Unicast routing - Distance Vector Routing - RIP - Link State Routing - OSPF - Path-vector routing- BGP - Multicast Routing: DVMRP

PART-A

Q.No	Questions	BT Level	Competence
1.	What are the responsibilities of the network layer?	BTL 1	Remember
2.	Define IP address.	BTL 1	Remember
3.	What is the purpose of subnetting?	BTL 1	Remember
4.	Distinguish between IPv4 and IPv6.	BTL 2	Understand
5.	What is the function of ICMP?	BTL 1	Remember
6.	Define DHCP.	BTL 1	Remember
7.	What are the fields in the IPv4 header?	BTL 1	Remember
8.	List the address classes in IPv4.	BTL 1	Remember
9.	What is CIDR?	BTL 2	Understand
10.	Define static and dynamic routing.	BTL 1	Remember
11.	What is unicast routing?	BTL 1	Remember

12.	Explain the concept of hop count.	BTL 2	Understand
13.	What is Distance Vector Routing?	BTL 1	Remember
14.	Choose the class of the following IP address: (a) 110.34.56.45 (b) 212.208.63.23	BTL 2	Understand
15.	What is the purpose of Link State Routing?	BTL 2	Understand
16.	Compare RIP and OSPF.	BTL 2	Understand
17.	Define BGP and its role in the Internet.	BTL 1	Remember
18.	What is a routing table?	BTL 1	Remember
19.	What is the difference between intra-domain and inter-domain routing?	BTL 2	Understand
20.	Define path vector routing.	BTL 1	Remember
21.	What is the function of a router?	BTL 1	Remember
22.	Define multicast routing.	BTL 1	Remember
23.	What is DVMRP?	BTL 1	Remember
24.	List any two differences between unicast and multicast.	BTL 2	Understand
	PART-B		
1.	Explain the format and functions of the IPv4 header. (16)	BTL 4	Analyze
2.	Describe the different classes of IP addressing and subnetting with examples. (16)	BTL 5	Evaluate
3.	Compare IPv4 and IPv6 in detail. (16)	BTL 4	Analyze
4.	Explain the working of ICMP with message types. (16)	BTL 4	Analyze
5.	Describe the operations and message flow of DHCP. (16)	BTL 4	Analyze
6.	Explain subnetting and supernetting with examples. (16)	BTL 5	Evaluate
7.	Describe unicast routing with different routing protocols. (16)	BTL 4	Analyze
8.	Explain Distance Vector Routing with examples. (16)	BTL 5	Evaluate
9.	i).Describe the Link State Routing algorithm with steps. (8) ii).Nodes using Link-State algorithm. Also update the forwarding table of node C. (8)	BTL 4	Analyze

			
10.	Compare RIP and OSPF with routing table examples. (16)	BTL 5	Evaluate
11.	Explain the working and importance of BGP in path-vector routing. (16)	BTL 4	Analyze
12.	Describe the algorithm and operations of DVMRP. (16)	BTL 4	Analyze
13.	Explain the concept and structure of routing tables in routers. (16)	BTL 5	Evaluate
14.	Analyze intra-domain and inter-domain routing protocols. (16)	BTL 5	Evaluate
15.	Compare unicast, multicast and broadcast routing. (16)	BTL 5	Evaluate
16.	Design a subnetting scheme for a given IP address and requirement. (16)	BTL 6	Create
17.	Evaluate the advantages and limitations of different IP routing (16)	BTL 6	Create

UNIT - IV: TRANSPORT LAYER

Introduction - Transport-Layer Protocols: UDP - TCP: Connection Management - Flow control - Congestion Control - Congestion avoidance (DECbit, RED) – SCTP - Quality of Service

PART- A

1.	What is the primary role of the transport layer in the OSI model?	BTL1	Remember
2.	Differentiate between connection-oriented and connectionless services.	BTL2	Understand
3.	Name two protocols used at the transport layer.	BTL1	Remember
4.	What is the purpose of port numbers in the transport layer?	BTL2	Understand
5.	List two key features of UDP.	BTL1	Remember
6.	Why is UDP considered an unreliable protocol?	BTL2	Understand
7.	Give two applications where UDP is preferred over TCP.	BTL1	Remember
8.	What are the advantages of using UDP?	BTL2	Understand
9.	What is the purpose of TCP's three-way handshake?	BTL-2	Understand
10	Define socket and its role in process communication.	BTL-2	Understand
11.	Define flow control and mention why it is needed.	BTL-2	Understand
12.	What is the purpose of the TCP sliding window mechanism?	BTL-2	Understand
13.	Differentiate between flow control and error control.	BTL-2	Understand
14.	What is congestion in a network?	BTL-1	Remember

15.	List two factors that cause congestion in a network.	BTL-1	Remember
16.	How does TCP handle congestion control?	BTL-2	Understand
17.	Define the congestion window (cwnd) in TCP.	BTL-1	Remember
18.	What is the objective of congestion avoidance mechanisms?	BTL-2	Understand
19.	Write a short note on the DECbit congestion control mechanism.	BTL-2	Understand
20.	What does RED stand for? Explain briefly.	BTL-1	Remember
21.	How does Random Early Detection (RED) work?	BTL-2	Understand
22.	What are the major features of SCTP?	BTL-1	Remember
23.	How is SCTP different from TCP?	BTL-2	Understand
24.	Define Quality of Service (QoS) and mention any two QoS parameters.	BTL-2	Understand
	PART-B		
1.	Explain the architecture and services of the transport layer in detail.	BTL-2	Understand
2.	Compare and contrast the features and applications of UDP and TCP protocols with examples.	BTL-4	Analyze
3.	Describe the steps involved in the TCP connection establishment and termination using the 3-way and 4-way handshake mechanisms.	BTL-2	Understand
4.	With a neat diagram, explain the TCP segment format and its significance.	BTL-3	Apply
5.	Analyze the TCP flow control mechanism using the sliding window protocol with suitable examples.	BTL-4	Analyze
6.	Design a reliable transport protocol incorporating essential features like error detection, retransmission, and congestion control. Justify your design.	BTL-6	Create
7.	Evaluate the advantages and disadvantages of TCP over UDP in real-time applications	BTL-5	Evaluate
8.	Explain the different TCP congestion control algorithms in detail.	BTL-2	Understand
9.	Discuss in detail the congestion control mechanism using the congestion window and slow start algorithm in TCP.	BTL-3	Apply
10.	Describe the Congestion Avoidance techniques – DECbit and RED with diagrams and compare their performance.	BTL-4	Analyze
11.	Examine how Random Early Detection (RED) helps in congestion control. Explain the algorithm with steps.	BTL-4	Analyze
12.	What is SCTP? Discuss its features, chunk structure, and advantages over TCP and UDP	BTL-2	Understand
13.	Compare TCP, UDP, and SCTP in terms of reliability, connection management, flow control, and congestion handling.	BTL-4	Analyze
14.	Illustrate how SCTP supports multihoming and multi streaming. What benefits do these features provide?	BTL-3	Apply
15.	Define Quality of Service (QoS). Describe various QoS parameters and explain how transport layer protocols can support QoS.	BTL-2	Understand
16.	Propose a strategy to improve QoS in a congested network using appropriate transport-layer features.	BTL-6	Create

17.	Create a simulation model or detailed scenario where you show the functioning of flow control and congestion control using TCP.	BTL-6	Create
UNIT - V: APPLICATION LAYER			
Application Layer protocols: HTTP - FTP - Email protocols (SMTP - POP3 - IMAP - MIME) - DNS - SNMP			
PART-A			
1	What is the purpose of the application layer in the OSI model?	BTL-1	Remember
2	Define HTTP and mention its default port.	BTL-1	Remember
3	Differentiate between HTTP and HTTPS.	BTL-2	Understand
4	What is meant by a stateless protocol? Give an example.	BTL-2	Understand
5	Write any two HTTP request methods.	BTL-1	Remember
6	What is the function of FTP?	BTL-1	Remember
7	List the two modes of FTP communication.	BTL-1	Remember
8	How does active mode FTP differ from passive mode FTP?	BTL-2	Understand
9	Define SMTP and state its role in email communication.	BTL-1	Remember
10	Compare SMTP and POP3.	BTL-2	Understand
11	What is the use of IMAP in email retrieval?	BTL-2	Understand
12	List two advantages of using IMAP over POP3.	BTL-2	Understand
13	What does MIME stand for, and what is its role in emails?	BTL-1	Remember
14	Mention two MIME content types.	BTL-1	Remember
15	What is DNS and why is it important?	BTL-1	Remember
16	Define domain name and give an example.	BTL-1	Remember
17	What is a DNS resolver?	BTL-2	Understand
18	List any two types of DNS records.	BTL-1	Remember
19	What is SNMP and where is it used?	BTL-1	Remember
20	List the components of SNMP architecture.	BTL-2	Understand
21	Differentiate between SNMPv1 and SNMPv3.	BTL-2	Understand
22	What are the roles of MIB and OID in SNMP?	BTL-2	Understand
23	How does SNMP help in network management?	BTL-2	Understand
24	Mention any two application layer protocols and their uses.	BTL-1	Remember

PART-B			
1	Explain the functions and services provided by the application layer in detail.	BTL-2	Understand
2	Describe HTTP protocol in detail. Explain the request and response message formats.	BTL-2	Understand
3	Compare HTTP and FTP protocols with respect to their working principles and usage scenarios.	BTL-4	Analyze
4	Explain the working of FTP with neat diagrams. Highlight the difference between active and passive modes.	BTL-3	Apply
5	Describe the SMTP protocol. Illustrate the SMTP interaction between sender and receiver.	BTL-2	Understand
6	Discuss the differences among SMTP, POP3, and IMAP protocols with examples.	BTL-4	Analyze
7	Write notes on the structure and working of MIME. How does MIME enhance email communication?	BTL-3	Apply
8	Explain the role and architecture of DNS. How does DNS resolve a domain name to an IP address?	BTL-2	Understand
9	Discuss the different types of DNS records and their significance in name resolution.	BTL-4	Analyze
10	Analyze the hierarchy of domain name system and explain the roles of root, TLD, and authoritative servers.	BTL-4	Analyze
11	Describe the components and message format of SNMP protocol.	BTL-2	Understand
12	Compare SNMP versions and evaluate their suitability in modern network environments.	BTL-5	Evaluate
13	Explain the structure and function of MIB in SNMP.	BTL-2	Understand
14	Describe how SNMP agents and managers interact.	BTL-3	Apply
15	Critically analyze the security features in SNMPv3.	BTL-5	Evaluate
16	Design an email system architecture using SMTP, POP3/IMAP, and MIME. Explain each module’s function.	BTL-6	Create
17	Propose a secure data exchange mechanism using HTTPS and MIME.	BTL-6	Create