



VALLIAMMAI ENGINEERING COLLEGE
SRM Nagar, Kattankulathur – 603203.
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



QUESTION BANK

SUBJECT: CS8391 – COMPUTER NETWORKS

SEM / YEAR: V / III

UNIT I - INTRODUCTION AND PHYSICAL LAYER

Networks –Network Types –Protocol Layering –TCP/IP Protocol suite –OSI Model –Physical Layer: Performance –Transmission media –Switching –Circuit-switched Networks –Packet Switching.

PART A

S. NO	QUESTIONS	LEVEL	COMPETENCE
1	Describe computer networks.	BTL -1	Remember
2	What differentiates a computer network from other types of networks?	BTL -1	Remember
3	Explain why are protocols needed?	BTL -5	Evaluate
4	How would you describe information?	BTL -1	Remember
5	Can you list five components of data communication?	BTL -1	Remember
6	In what way would you analyze circuit switched and packet switched networks?	BTL -4	Analyze
7	Explain the characteristics of data communication system.	BTL -4	Analyze
8	Define Simplex, Half-Duplex and Full-Duplex.	BTL -1	Remember
9	Discuss the different network criteria.	BTL -2	Understand
10	Can you explain the relationship between period and frequency?	BTL -4	Analyze
11	How would you demonstrate internet and Internet?	BTL -3	Apply
12	Generalize LAN, WAN and MAN.	BTL -6	Create
13	How would you illustrate the differences between parallel and serial transmission?	BTL -3	Apply
14	Classify about types major classes of guided media.	BTL -3	Apply
15	Compose five line coding schemes.	BTL -6	Create
16	Describe the three types of transmission impairment.	BTL -2	Understand
17	Express how the Shannon capacity have to do with communication?	BTL -2	Understand
18	Solve How many bits of data in a transcontinental channel with a one-way latency of 50ms and a bandwidth of 45Mbps can hold?	BTL -5	Evaluate
19	List four major components of a packet switch and their functions.	BTL -1	Remember
20	Can you discriminate bandwidth and latency?	BTL -2	Understand

PART B

1	Explain in detail about TCP/IP protocol suite with neat diagram? (13)	BTL -1	Remember
---	--	--------	----------

2	i. Examine OSI architecture with neat diagram. (7) ii. Evaluate and explain about your understanding about network. (6)	BTL -5	Evaluate
3	Explain in detail about periodic analog and digital signals. (13)	BTL -3	Apply
4	Will you state and describe in your own words about a model for network topologies?(13)	BTL -2	Understand
5	i. Write a note on Quadrature amplitude modulation.(7) ii. Based on what you learn develop a model for constellation diagram. (6)	BTL -1	Remember
6	i. How would you illustrate line coding schemes?(7) ii. Explain in detail about block coding schemes. (6)	BTL -2	Understand
7	i. Write short notes on Quality of service. (5) ii. Summarize about performance of computer network. (8)	BTL -3	Apply
8	Explain in detail about Multiplexing FDM, TDM and WDM. (13)	BTL -5	Evaluate
9	i. Describe A-D conversion in detail. (7) ii. Describe Digital to Analog Conversion in detail. (6)	BTL -1	Remember
10	Explain the following encoding schemes with examples. i. NRZ (4) ii. NRZI (4) iii. Manchester (5)	BTL -2	Understand
11	Describe the techniques to spread the bandwidth: FHSS and DSSS. (13)	BTL -4	Analyze
12	i. Discuss in detail about guided media for transmission. (7) ii. Discuss in detail about unguided media for transmission. (6)	BTL -4	Analyze
13	Explain in detail about the different phases of Virtual –Circuit networks. (13)	BTL -1	Remember
14	i. Draw the structure of switch and explain the circuit switching in detail. (7) ii. Describe the different components used in packet switch.(6)	BTL -6	Create
PART C			
1	What is the bandwidth of a signal that can be decomposed into five sine waves with frequencies at 0, 20, 50, 100, and 200 Hz? All peak amplitudes are the same. Draw the bandwidth. (15)	BTL -6	Create
2	We mentioned that two types of networks, datagram and virtual-circuit, need a routing or switching table to find the output port from which the information belonging to a destination should be sent out, but a circuit-switched network has no need for such a table. Give the reason for this difference. Analyze (15)	BTL -4	Analyze
3	Four channels, two with a bit rate of 200 kbps and two with a bit rate of 150 kbps, are to be multiplexed using multiple-slot TDM with no synchronization bits. Answer the following questions: a. What is the size of a frame in bits? b. What is the frame rate? c. What is the duration of a frame? d. What is the data rate? (15)	BTL -5	Evaluate
4	We have a baseband channel with a 1-MHz bandwidth. What is the data rate for this channel if we use each of the following line coding schemes? Formulate a. NRZ-L b. Manchester c. MLT-3 d. 2B1Q (15)	BTL -6	Create
UNIT II - DATA-LINK LAYER & MEDIA ACCESS			

Introduction –Link-Layer Addressing –DLC Services –Data-Link Layer Protocols –HDLC –PPP - Media Access Control -Wired LANs: Ethernet -Wireless LANs –Introduction –IEEE 802.11, Bluetooth –Connecting Devices.			
PART A			
1	How will you summarize Detection versus Correction?	BTL -5	Evaluate
2	Define coding schemes.	BTL -1	Remember
3	Explain the basic service set (BSS) and the extended service set (ESS).	BTL -1	Remember
4	Can you classify the types of Errors?	BTL -4	Analyze
5	Can you explain Framing?	BTL -4	Analyze
6	How would you describe access point?	BTL -1	Remember
7	Differentiate Byte stuffing and Bit stuffing.	BTL -2	Understand
8	Can you explain frame format of Ethernet?	BTL -4	Analyze
9	Illustrate the function of hop by hop flow control.	BTL -3	Apply
10	Discuss the Unicast, Multicast, and Broadcast Addresses.	BTL -2	Understand
11	Give the ARP packet format for mapping IP addresses into Ethernet addresses.	BTL -2	Understand
12	Summarize the PPP packet format.	BTL -5	Evaluate
13	What examples can you find to illustrate ?	BTL -3	Apply
14	Show your understanding about payload.	BTL -3	Apply
15	How would you design ?	BTL -6	Create
16	Describe Media Access Control.	BTL -1	Remember
17	How would you describe repeater?	BTL -1	Remember
18	Draw the two types of networks of Bluetooth: piconet and scatternet.	BTL -6	Create
19	Define Bluetooth.	BTL -1	Remember
20	Differentiate forwarding and routing.	BTL -2	Understand
PART B			
1	i. Describe about services provided by the data-link layer. (7) ii. Explain how data-link layer into two sublayers(6)	BTL -1	Remember
2	i. Define three types of addresses.(6) ii. Explain about ARP operation?(7)	BTL -5	Evaluate
3	i. Describe the algorithm to calculate an 8-bit Fletcher checksum(7) ii. Write the algorithm to calculate an Adler checksum(6)	BTL -2	Understand
4	i. Write Cyclic Redundancy Check shows an example of a CRC code.(7) ii. Explain and solve CRC division using polynomials(6)	BTL -2	Understand
5	Write the Procedure & Algorithm to calculate the traditional checksum(13)	BTL -1	Remember
6	Describe in detail about central concepts in coding for error control. (13)	BTL -2	Understand
7	Classify in detail about High-level Data Link Control and the types of frames. (13)	BTL -3	Apply
8	i. Explain the services Provided by PPP (7) ii. Define PPP. Describe the details with neat diagram.(6)	BTL -4	Analyze
9	Explain random-access methods - ALOHA,CSMA,CSMA/CD & CSMA/CA. (13)	BTL -4	Analyze

10	Describe the design procedure for Simple, Stop-and-Wait, Go-Back-N, and Selective-Repeat.(13)	BTL -1	Remember
11	i. Quote the Services Provided by Telephone Networks.(7) ii. Draw and explain the architecture of a SONET system(6)	BTL -1	Remember
12	i. How would you demonstrate your understanding of problems about Ethernet LAN? (7) ii. Explain in detail about collision avoidance in Wi-Fi (802.11). (6)	BTL -3	Apply
13	i. What is common ETHERNET implementation? Discuss about the sub layer. (7) ii. Explain and differentiate FDDI and Ethernet. (6)	BTL -5	Evaluate
14	How would you describe about Bluetooth and develop with neat sketch about its architecture? (13)	BTL -6	Create

PART C

1	With the neat sketches, formulate and explain the working principle of CRC with an example. (15)	BTL -6	Create
2	Consider sending a 3500-byte datagram that has arrived at a router R1 that needs to be sent over a link that has an MTU size of 1000 bytes to R2. Then it has to traverse a link with as MTU of 600 bytes. Let the identification number of the original datagram be 465. How many fragments are delivered at the destination? Analyze the parameters associated with each of these fragments. (15)	BTL -4	Analyze
3	Summarize the size of an ARP packet when the protocol is IPv4 and the hardware is Ethernet? (15)	BTL -5	Evaluate
4	Use IEEE 802.3 and IEEE 802.11 to generalize the differences between wired and wireless LANS. (15)	BTL -6	Create

UNIT III – NETWORK LAYER

Network Layer Services –Packet switching –Performance –IPV4 Addresses –Forwarding of IP Packets -Network Layer Protocols: IP, ICMP v4 –Unicast Routing Algorithms –Protocols –Multicasting Basics –IPV6 Addressing –IPV6 Protocol.

PART A

1	Write about Forwarding and Routing.	BTL -1	Remember
2	How would you describe packetizing?	BTL -1	Remember
3	Can you summarize the two different classes of routing protocol?	BTL -5	Evaluate
4	How would you describe distance vector routing?	BTL -1	Remember
5	In what way would you rank convergence?	BTL -1	Remember
6	Explain count to infinity problem.	BTL -4	Analyze
7	Interpret about split horizon with poison reverse.	BTL -4	Analyze
8	Define Split horizon.	BTL -1	Remember
9	Discuss about RIP.	BTL -2	Understand
10	Explain Link State Routing.	BTL -4	Analyze
11	Can you discover the sketch of IPv6 Packet Header?	BTL -3	Apply
12	Compose the OSPF header format.	BTL -6	Create
13	Examine Reliable Flooding.	BTL -3	Apply
14	Explain Load Balancing.	BTL -3	Apply
15	Generalize about Switching.	BTL -6	Create
16	Express in your own words about Line Rate.	BTL -2	Understand
17	Can you differentiate IPv4 and IPv6?	BTL -2	Understand

18	What examples can you find to demonstrate compute delay for the packet?	BTL -5	Evaluate
19	How would you define your understanding of Multicast?	BTL -1	Remember
20	Based on what you know, generalize the term Network Address Translation.	BTL -2	Understand
PART B			
1	i. Describe in detail about Switching and Forwarding.(7) ii. Describe in detail about concept of connection-oriented service.(6)	BTL -1	Remember
2	Explain the concept to include the role of IP addresses in forwarding(13)	BTL -5	Evaluate
3	i. How would you demonstrate the challenges in inter-domain routing? (7) ii. How would you summarize the services expected from the network layer? (6)	BTL -3	Apply
4	i. Describe in detail about RIP. (7) ii. Discuss about sub-netting. (6)	BTL -2	Understand
5	i. Can you discuss in detail what is happening in link state? (7) ii. What is internet multicasting? Explain in details.(6)	BTL -1	Remember
6	i. With a neat diagram explain distance vector routing protocol. (7) ii. Demonstrate the working of Protocol Independent Multicast (PIM) in detail. (6)	BTL -3	Apply
7	Discuss Internet Control Message Protocol version 4 (13)	BTL -2	Understand
8	i. Point out the function of DVMRP? Narrate in detail.(7) ii. Describe in detail the operation of OSPF protocol by considering a suitable network. (6)	BTL -4	Analyze
9	i. Describe in detail about reliable flooding. (6) ii. Can you substitute an alternative protocol for PIM? Justify your answer. (7)	BTL -1	Remember
10	i. Generalize and explain about Multicast address. (7) ii. Explain the RIP algorithm with a sample example of your choice. (6)	BTL -5	Evaluate
11	i. Discuss the IP addressing methods. (7) ii. Explain about ipv6? Compare ipv4 and ipv6. (6)	BTL -4	Analyze
12	Discuss about unicast routing algorithms (13)	BTL -2	Understand
13	Define and describe Classful Addressing and Classless Addressing (13)	BTL -1	Remember
14	Develop with example how to measure the performance of a network (13)	BTL -6	Create
PART C			
1	Analyze how the protocol Independent multicast protocols scale well in environments where a relative small proportion of routers want to receive traffic for certain group? (15)	BTL -4	Analyze
2	With the neat sketches generalize the algorithm of link state routing and explain the same. (15)	BTL -6	Create
3	Consider hosts A and B have been assigned the same IP address on the same Ethernet, on which ARP is used B starts up after A. What will happens to A's existing connections? Explain how' self -ARP might help with is problem. (15)	BTL -5	Evaluate
4	Why subnetting is necessary? With suitable example, develop the concept of subnetting in class B network. (15)	BTL -6	Create

UNIT IV - TRANSPORT LAYER			
Introduction –Transport Layer Protocols –Services –Port Numbers –User Datagram Protocol –Transmission Control Protocol –SCTP.			
PART A			
1	How would you describe the header format of UDP?	BTL -1	Remember
2	Discuss Process-Process communication.	BTL -2	Understand
3	Summarize IP addresses versus port numbers	BTL -5	Evaluate
4	What ideas can you point out that TCP is a reliable byte stream protocol?	BTL -1	Remember
5	How would you describe the header format of TCP?	BTL -1	Remember
6	Can you list the three ways of handshake?	BTL -1	Remember
7	Measure the performance of TCP State Transition Control.	BTL -4	Analyze
8	Express nagle's algorithm.	BTL -2	Understand
9	What would you infer from the term RTT?	BTL -1	Remember
10	Explain what is happening in Congestion Control.	BTL -4	Analyze
11	Demonstrate RED.	BTL -3	Apply
12	Develop the value or importance of Congestion Window.	BTL -6	Create
13	Apply your understanding of AIMD.	BTL -3	Apply
14	Discover the processes involved in Slow Start.	BTL -3	Apply
15	Combine your opinion about integrated service.	BTL -6	Create
16	What examples can you infer in Quality of service approaches?	BTL -4	Analyze
17	Discuss SCTP several types of chunks?	BTL -2	Understand
18	Based on what you know, summarize the term Differentiated service?	BTL -5	Evaluate
19	How would you define Expedited forwarding?	BTL -1	Remember
20	Can you interpret the reason behind assured forwarding?	BTL -2	Understand
PART B			
1	i. How would you develop the operation of TCP with neat sketch on it? (7) ii. Explain in detail about sliding window protocol. (6)	BTL -6	Create
2	i. Illustrate in detail about UDP header format with neat sketch. (7) ii. Describe in detail about UDP message queue technique with neat sketch. (6)	BTL -3	Apply
3	i. How would you describe UDP and TCP? (7) ii. Will you state or interpret in your own words about error control in TCP and UDP with an example? (6)	BTL -1	Remember
4	i. Explain in detail about the three way handshake protocol for connection establishment in TCP. (7) ii. Describe in detail about reliable flooding. (6)	BTL -4	Analyze
5	Explain the flow control mechanism and derive eight segments are exchanged between the client and server. (13)	BTL -5	Evaluate
6	How is congestion controlled? Explain in detail about congestion control mechanisms in transport layer. (13)	BTL -5	Evaluate
7	i. How would you summarize TCP congestion control like AIMD Slow start Fast transmit and fast recovery?(7) ii. With TCPs slow start and AIMD for congestion control, show how the window size will vary for a transmission where every 5 th packet is lost. Assume an advertised window size of 50 MSS. (6)	BTL -2	Understand
8	Explain three versions of TCP: Tahoe TCP, Reno TCP, and New Reno TCP	BTL -1	Remember

	(13)		
9	Discuss the TCP state machines and the transition diagrams (13)	BTL -2	Understand
10	Based on what you know, illustrate the general features of SCTP? (13)	BTL -3	Apply
11	Summarize the services offered by SCTP to the application-layer processes (13)	BTL -2	Understand
12	i. Explain the principles of congestion control in TCP.(7) ii. Explain the following TCP header and Adaptive flow control.(6)	BTL -4	Analyze
13	How is congestion controlled? Explain in detail about TCP's general policy for handling congestion. (13)	BTL -1	Remember
14	Define UDP. Discuss the operation of UDP. Explain UDP checksum with an example. (13)	BTL -1	Remember
PART C			
1	Explain the adaptive transmission mechanism and how it has evolved time as the Internet community has gained more experience using TCP. (15)	BTL -4	Analyze
2	Generalize each field of the format of the TCP packet header. Specify the justification for having variable field lengths for the fields in the TCP header. (15)	BTL -6	Create
3	Explain about UDP and TCP features with neat diagrammatic representation. (15)	BTL -5	Evaluate
4	Describe with examples the three mechanisms by which congestion control is formulated in TCP. (15)	BTL -6	Create
UNIT V - APPLICATION LAYER			
WWW and HTTP –FTP –Email –Telnet –SSH –DNS –SNMP.			
PART A			
1	Define Hypertext and hypermedia.	BTL -1	Remember
2	Can you list the five types of HTTP result codes?	BTL -1	Remember
3	How would you express URL?	BTL -2	Understand
4	Define Persistent and Non-persistent connections.	BTL -1	Remember
5	Can you list the SMTP commands?	BTL -1	Remember
6	Can you point-out the format of an e-mail?	BTL -4	Analyze
7	Differentiate IMAP and POP.	BTL -4	Analyze
8	Tell what would happen when you try to open a URL?	BTL -1	Remember
9	Can you summarize some FTP commands?	BTL -2	Understand
10	Explain some responses in FTP.	BTL -4	Analyze
11	How would you discover MIME types and subtypes?	BTL -3	Apply
12	How would you generalize SSH components?	BTL -6	Create
13	How would you apply your understanding of namespace?	BTL -3	Apply
14	What information would you use to examine the view of DNS?	BTL -3	Apply
15	Develop web-based mail.	BTL -6	Create
16	Describe the protocol used for e-mail security.	BTL -2	Understand
17	Give name-address resolution.	BTL -2	Understand
18	How would you explain the message format of SMTP?	BTL -5	Evaluate
19	Tabulate security of DNS?	BTL -1	Remember
20	Based on what you know, discuss DDNS?	BTL -2	Understand

PART B			
1	i. Describe in detail about Traditional applications.(7) ii. What approach would you used to formaulate network management protocol? (6)	BTL -6	Create
2	What elements would you use to demonstrate the MIME type? Explain in detail. (13)	BTL -3	Apply
3	i. Summarize the request message format of HTTP.(7) ii. Summarize the response message format of HTTP.(6)	BTL -5	Evaluate
4	Describe in detail about the following in Electronic mail. i. Message format (5) ii. Message transfer (4) iii. Mail reader (4)	BTL -1	Remember
5	i. Summarize how SMTP transfers message from one host to another host with suitable illustration.(7) ii. Can you associate the functions performed by DNS? Give example. (6)	BTL -5	Evaluate
6	i. Point-out the short notes on DNS. (7) ii. Write short notes on FTP. (6)	BTL -4	Analyze
7	i. Discuss the advantage of DNS. (7) ii. Write notes on URLS. (6)	BTL -1	Remember
8	How S-MIME provide better security for E-Mail? Discuss in detail. (13)	BTL -2	Understand
9	i. Explain Telnet in detail. (7) ii. Illustrate the role of POP3 in electronic mail applications. Explain in detail. (6)	BTL -1	Remember
10	Illustrate in detail about DNS messages. (13)	BTL -3	Apply
11	Discuss name-address resolution in detail. (7) Discuss various types of resolution in detail. (6)	BTL -2	Understand
12	i. Can you substitute an alternative protocol for IMAP? Justify your answer. (7) ii. Describe in detail about the WSDL in web services. (6)	BTL -2	Understand
13	Explain how FTP have a message format for exchanging commands and responses during control connection? (13)	BTL -4	Analyze
14	i. Describe the elements of network management in detail. (7) ii. Explain the operation of SNMP protocol in detail. (6)	BTL -1	Remember
PART C			
1	Analyze the message format and the message transfer and the underlying protocol involved in the working of the electronic mail. (15)	BTL -4	Analyze
2	Generalize how SMTP protocol is used in E-mail applications? (15)	BTL -6	Create
3	Explain in detail about web service architecture. (15)	BTL -5	Evaluate
4	Generalize the structure of HTTP server receives a request message from an HTTP client, how does the server know when all headers have arrived and the body of the message is to follow? (15)	BTL -6	Create