SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF COMPUTER APPLICATIONS

QUESTION BANK

I SEMESTER

MC4164- COMPUTER NETWORKS AND MANAGEMENT

Regulation – 2024

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SUBJECT : MC4164– COMPUTER NETWORKS AND MANAGEMENT

SEM / YEAR: I/I

UNIT I-ARCHITECTURE AND APPLICATION				
Data networks –Network Architecture - ISO/OSI and TCP/IP reference models —HTTP and HTTPS,FTP, E-mail and DNS				
PART - A				
Q. No	**Questions**	**BT Level**	**Competence**	**CO's**
1.	Define computer networks?	BTL1	Remembering	CO1
2.	State the major functions performed by the presentation layer of the ISO- OSI model	BTL2	Understanding	CO1
3.	List the five components of data communication system?	BTL1	Remembering	CO1
4.	Define data communication and state its characteristics.	BTL2	Understanding	CO1
5.	List out the similarity between transport layer and data link layer?	BTL1	Remembering	CO1
6.	List the metrics that influence the performance of the network.	BTL1	Remembering	CO1
7.	What is meant by peer to peer networks?	BTL1	Remembering	CO1
8.	What does Protocol layering mean?	BTL1	Remembering	CO1
9.	Which layer implements the node to node channel connection in OSI Layered architecture?	BTL2	Understanding	CO1
10.	What are the applications of Computer Networks?	BTL2	Understanding	CO1
11.	List the services provided by transport layer protocol?	BTL1	Remembering	CO1
12.	State the important roles of Data Link Layer.	BTL2	Understanding	CO1
13.	Write the use of Hyper Text Transfer Protocol	BTL2	Understanding	CO1
14.	What is the default connection type used by HTTP?	BTL1	Remembering	CO1
15.	What is a HTTPS called?	BTL2	Understanding	CO1
16.	Narrate the main objective of FTP?	BTL2	Understanding	CO1
17.	What is persistent HTTP?	BTL1	Remembering	CO1
18.	What is a protocol? What are the key elements of a protocol?	BTL1	Remembering	CO1
19.	Outline the need for DNS.	BTL2	Understanding	CO1
20.	Draw the scenario of Electronic Mail	BTL1	Remembering	CO1
21.	What is the difference between email and DNS?	BTL2	Understanding	CO1
22.	Mention the different levels in domain name space.	BTL1	Remembering	CO1
23.	What is the resource records used for DNS?	BTL2	Understanding	CO1
24.	Inspect the salient features of IPv6	BTL1	Remembering	CO1

	PART-B			
1.	Discuss about the various types of networks topologies along with their advantages and disadvantages in detail.(16)	BTL4	Analyzing	CO1
2.	Discuss about the types of computer networks in detail (16)	BTL3	Applying	CO1
3.	Discuss the various applications of computer networks in detail.(16)	BTL4	Analyzing	CO1
4.	What is TCP/IP reference model? Explain the functions and protocoland services of each layer? (16)	BTL4	Analyzing	CO1
5.	Compare the ISO-OSI and TCP/IP reference models.(16)	BTL5	Evaluating	CO1
6.	What is OSI reference model? Explain the functions and protocols services of each layer? (16)	BTL4	Analyzing	CO1
7.	Explain the types of connections in FTP (i) Control connection (8) (ii) Data Connection (8)	BTL3	Applying	CO1
8.	Outline the steps involved in building a computer network. Give the detailed description for each step.(16)	BTL5	Evaluating	CO1
9.	Discuss the protocols used for Electronic mail.(16)	BTL4	Analyzing	CO1
10.	Explain and Present the evolution and the types of Networks. (16)	BTL3	Applying	CO1
11.	What is HTTPS? How it works and why it's so important?(16)	BTL3	Applying	CO1
12.	How FTP works? Discuss in detail?(16)	BTL4	Analyzing	CO1
13.	Explain in detail about application, advantage and disadvantages of FTP?(16)	BTL3	Applying	CO1
14.	Write down the working principles of HTTP.(16)	BTL3	Applying	CO1
15.	Explain in detail about HTTP operations.(16)	BTL3	Applying	CO1
16.	Explain the working principles of FTP with neat diagram.(16)	BTL4	Analyzing	CO1
17.	Develop the services offered by the Domain Name Service protocol with neat diagram.(16)	BTL6	Creating	CO1
	UNIT II SOCKET PROGRAMMING			
	System calls and socket programming, Elementary TCP and UDP socket - Developing client/server applications –Socket Options - Advanced Socket IP options for IPv6 server and client's interoperability- Raw Sockets.			
	PART - A			
1.	Define socket and list out its type.	BTL1	Remembering	CO2
2.	Define system calls	BTL1	Remembering	CO2
3.	How can a socket be created? Write the syntax of creating a socket.	BTL2	Understanding	CO2
4.	What are the steps involved in creating a socket on client side?	BTL1	Remembering	CO2
5.	What is socket address structure?	BTL1	Remembering	CO2
6.	What is the main difference between TCP and UDP?	BTL2	Understanding	CO2
7.	Why TCP services are called stream delivery services?	BTL2	Understanding	CO2
8.	Specify some of the generic socket option.	BTL2	Understanding	CO2
9.	Define the term IPv6 and its advantages.	BTL1	Remembering	CO2
10.	Mention the TCP socket option	BTL2	Understanding	CO2
11.	Write about different IP socket options	BTL1	Remembering	CO2
12.	Mention the IPV6 socket option	BTL2	Understanding	CO2

13.	List the need for client side programming.	BTL1	Remembering	CO2
14.	How to build a client-server application?	BTL2	Understanding	CO2
15.	What are the three main components of the client-server application architecture?	BTL2	Understanding	CO2
16.	What are the advantages of client-server model?	BTL1	Remembering	CO2
17.	Define UDP datagram.	BTL1	Remembering	CO2
18.	Write a program for UDP client program by using connect function.	BTL2	Understanding	CO2
19.	Differentiate connected and unconnected UDP Sockets	BTL2	Understanding	CO2
20.	Define the term interoperability	BTL1	Remembering	CO2
21.	How to create a raw socket?	BTL2	Understanding	CO2
22.	Differentiate between raw socket and UDP socket	BTL2	Understanding	CO2
23.	List out the importance of Interoperability in client- server concept	BTL1	Remembering	CO2
24.	What are the advantages of raw sockets?	BTL1	Remembering	CO2
	PART-B			
1.	Discuss various system calls with an example.(16)	BTL3	Applying	CO2
2.	Explain the socket functions for elementary TCP with a neat diagram.(16)	BTL4	Analyzing	CO2
3.	Narrate system calls with its parameter descriptions.(16)	BTL3	Applying	CO2
4.	Explain in detail about the socket functions for elementary UDP with a neat diagram.(16)	BTL4	Analyzing	CO2
5.	Explain what will happen if transport layer is removed from TCP/IP protocol stack?(16)	BTL3	Applying	CO2
6.	List and describe advanced socket IP options for IPv6.(16)	BTL4	Analyzing	CO2
7.	(i) Explain the purpose and usage of UDP sockets and their different functions.(8) (ii) Brief the way in which a TCP client server different from UDP client server.(8)	BTL3	Applying	CO2
8.	What is socket? List and explain various socket primitives required in TCP socket program on client and server side.(16)	BTL4	Analyzing	CO2
9.	(i) Discuss about any four generic socket options in detail with suitable example.(8) (ii) Write the similarities between UDP socket and TCP socket.(8)	BTL5	Evaluating	CO2
10.	Describe about server and client's interoperability with example (16)	BTL6	Creating	CO2
11.	Write down the key aspects of server and client interoperability in socket programming with example.(16)	BTL4	Analyzing	CO2
12.	Discuss about the Tools and Technologies used for interoperability in client–server model(16)	BTL3	Applying	CO2
13.	How to build a client-server application? Explain in detail.(16)	BTL5	Evaluating	CO2
14.	Explain the various challenges to achieving Interoperability in client–server model.(16)	BTL3	Applying	CO2
15.	Explain socket functions for UDP client server with neat sketch.(16)	BTL3	Applying	CO2
16.	Discuss about various advanced IPv6 socket options are applicable for both server and Client.(16)	BTL6	Creating	CO2

17.	Write the steps followed for creating the raw sockets.(8) List out the rules used for the Raw Socket input.(8)	BTL5	Evaluating	CO2
UNIT III SECURE COMMUNICATION				
Secured Data Networks – CIA triangle - Encryption and Decryption – Symmetric and Asymmetric Cryptograms - End to end issues – Transport layer protocols – TCP extensions –IPSec – SSL and TLS protocols.				
PART-A				
1.	What is meant by secured network?	BTL1	Remembering	CO3
2.	Define security mechanism	BTL2	Understanding	CO3
3.	Specify the four categories of security threats.	BTL2	Understanding	CO3
4.	Define integrity and non repudiation.	BTL1	Remembering	CO3
5.	What are the key principles of security?	BTL2	Understanding	CO3
6.	What is end-to-end network security?	BTL1	Remembering	CO3
7.	What is meant by Denial-of-Service (DoS) attack?	BTL1	Remembering	CO3
8.	Which aspect of the CIA triad ensures that information is available to authorized users when needed?	BTL2	Understanding	CO3
9.	List out the importance of CIA triangle.	BTL1	Remembering	CO3
10.	What is the CIA triangle?	BTL1	Remembering	CO3
11.	List out the attacks during the communication across the network.	BTL1	Remembering	CO3
12.	Define crypt-analysis?	BTL1	Remembering	CO3
13.	Differentiate between a mono-alphabet cipher and a polyalphabetic Cipher?	BTL2	Understanding	CO3
14.	What is meant by encipherment?	BTL1	Remembering	CO3
15.	Write the limitations of Symmetric Cryptosystems.	BTL2	Understanding	CO3
16.	Compare the symmetric and asymmetric key cryptography	BTL2	Understanding	CO3
17.	What are the three events involved between source and destination connection of TCP?	BTL2	Understanding	CO3
18.	Differentiate between network layer delivery and the transport layer delivery.	BTL2	Understanding	CO3
19.	List end to end services.	BTL1	Remembering	CO3
20.	What is a Secure Socket Layer?	BTL1	Remembering	CO3
21.	Differentiate between an SSL connection and SSL session?	BTL2	Understanding	CO3
22.	Why TCP is called an end-to-end protocol?	BTL2	Understanding	CO3
23.	List down the properties of secure communication.	BTL1	Remembering	CO3
24.	What is a TLS certificate?	BTL1	Remembering	CO3
PART-B				
1.	Write different Types of Network Security in detail.(16)	BTL3	Applying	CO3
2.	(i) How does network security works? Explain in detail.(8) (ii) Write short note on the advantages and disadvantages of network security(8)	BTL4	Analyzing	CO3
3.	(i) Discuss about CIA triad models for network security.(8) (ii) Explain the importance, advantages and challenges of CIA triad in network security.(8)	BTL6	Creating	CO3
4.	Write a short note on cryptographic building blocks with neat diagram.(16)	BTL5	Evaluating	CO3
5.	Explain the following with an example (i) Ceaser Cipher(8) (i) Mono Alphabetic Cipher(8)	BTL3	Applying	CO3
6.	Draw the general structure of DES and explain the encryption decryption process.(16)	BTL6	Creating	CO3

7.	Explain in detail the key generation in AES algorithm and its expansion format.(16)	BTL3	Applying	CO3
8.	What are the requirements and applications of public key? Compare conventional with public key encryption. (16)	BTL5	Evaluating	CO3
9.	Explain the RSA algorithm and explain the RSA with p=7,q=11,e=17,M=8. Discuss its merit.(16)	BTL5	Evaluating	CO3
10.	Explain the classification of authentication functions in detail.(16)	BTL4	Analyzing	CO3
11.	Narrate the basic functions and characteristics of Transport Layer Protocol.(16)	BTL6	Creating	CO3
12.	Explain the need for TCP extensions with an example. (16)	BTL6	Creating	CO3
13.	Write short notes on end to end issues in networking. (16)	BTL3	Applying	CO3
14.	Explain the IPsec scenario and it's Services in detail.(16)	BTL3	Applying	CO3
15.	Write down the working principles and advantages of TLS.(16)	BTL5	Evaluating	CO3
16.	What is the use of SSL protocol? Explain SSL record protocol operation with SSL record format. (16)	BTL3	Applying	CO3
17.	Assess the impact of TLS on web application performance.(16)	BTL5	Evaluating	CO3
UNIT-IV L2 AND L3 PROTOCOL SAND DEVICES				
Medium Access Control – Ethernet – CSMA/CD – IEEE 802.11 WLAN – CSMA/CA – IPv4 – Addressing, VLSM, CIDR - IPv6 – Network devices – Hubs, Bridges,Switches, Routers, L3Switches				
1.	Define the term medium access control mechanism.	BTL1	Remembering	CO4
2.	What are the functions of MAC?	BTL1	Remembering	CO4
3.	List out the types of attack on MAC.	BTL1	Remembering	CO4
4.	Why IP address are called as "logical" address and the MAC address are called a "physical" address?	BTL2	Understanding	CO4
5.	What is meant by Ethernet?	BTL1	Remembering	CO4
6.	How two systems in an Ethernet network communicate?	BTL2	Understanding	CO4
7.	How is "collision" handled in Ethernet networks?	BTL2	Understanding	CO4
8.	Draw the Ethernet frame format.	BTL2	Understanding	CO4
9.	What is CSMA/CD?	BTL1	Remembering	CO4
10.	What do you understand by CSMA protocol?	BTL2	Understanding	CO4
11.	Relate persistent CSMA with non-persistent CSMA.	BTL2	Understanding	CO4
12.	Examine the access method used by wireless LAN?	BTL2	Understanding	CO4
13.	What are the types of wireless LAN?	BTL1	Remembering	CO4
14.	What are the three different types of CSMA protocols?	BTL1	Remembering	CO4
15.	How a host determines its IP address?	BTL2	Understanding	CO4
16.	List out classes of IP addresses?	BTL1	Remembering	CO4
17.	What are the benefits of using VLSM?	BTL1	Remembering	CO4
18.	What are the advantages of CIDR?	BTL2	Understanding	CO4
19.	How are IPv6addressesactuallybeing allocated?	BTL2	Understanding	CO4

20.	List the benefits of IPv6 Addresses	BTL1	Remembering	CO4
21.	Differentiate between a hub, switch, and router.	BTL2	Understanding	CO4
22.	What is a bridge? How it operates in the inter-networking scenario?	BTL1	Remembering	CO4
23.	What limitations of a bridge are overcome by a router?	BTL1	Remembering	CO4
24.	What is the purpose of Layer 3 switches?	BTL1	Remembering	CO4
	PART-B			
1.	(i) Describe the taxonomy of MAC layer .(8) (ii)Compare pure ALOHA with slotted ALOHA. (8)	BTL6	Creating	CO4
2.	Explain the control frames and addressing mechanisms in IEEE802.11 with necessary diagram.(16)	BTL3	Applying	CO4
3.	List and explain the types of persistence methods with suitable diagram. (16)	BTL4	Analyzing	CO4
4.	Illustrate the working of CSMA/CA protocol..(16)	BTL3	Applying	CO4
5.	(i) Discuss different types of addressing modes in IPv4.(8) (ii) Compare IPv4 and IPv6.(8)	BTL5	Evaluating	CO4
6.	Explain in detail CSMA/CD Protocol in detail. How it detects collision? (16)	BTL4	Analyzing	CO4
7.	Describe the following methods used in Controlled access protocol (i) Reservation (5 Marks) (ii) Polling (5 Marks) (iii) Token passing (6 Marks)	BTL4	Analyzing	CO4
8.	What is IP addressing? How it is classified? How is subnet addressing is performed?(16)	BTL4	Analyzing	CO4
9.	Describe the following mechanisms (i) FDMA (5 Marks) (ii) TDMA (5 Marks) (iii) CCMA (6 Marks)	BTL5	Evaluating	CO4
10.	Explain the IEEE 802.11 Architecture with neat diagram. (16)	BTL3	Applying	CO4
11.	What is IPv6? Explain IPv6 Header Representation with neat diagram (16)	BTL3	Applying	CO4
12.	(i) List the advantages of VLSM used in IP network design over FLSM (8) (ii)Write a short notes on CIDR(8)	BTL5	Evaluating	CO4
13.	What is meant by routers? Discuss different types of routers and its advantages and disadvantages.	BTL3	Applying	CO4
14.	(i) Differentiate between Network Hub and Switch (8) (ii) Discuss the types of network hub (8)	BTL6	Creating	CO4
15.	Write short notes on: (i) Types of Bridges.(8) (ii) How does a Bridge work? Explain the functions of Bridge in detail (8)	BTL4	Analyzing	CO4
16.	Construct the working principle of Switches, Hub and Routers.(16)	BTL5	Evaluating	CO4
17.	How does a Layer 3 switch work? What are the main features of a Layer 3 switches? Explain its benefits in detail.(16)	BTL4	Analyzing	CO4

UNIT-V
DEVICES, MONITORING AND MANAGEMENT

Edge and Core Networks – Introduction to SDN- data plane- control plane Honeypots –Firewalls –Network monitoring - IDS – Network Management System – SNMP and its variants

	PART A			
1.	How core network devices relay for High-performance and scalable infrastructure?	BTL2	Understanding	CO5
2.	What is a core and edge network?	BTL1	Remembering	CO5
3.	List out an examples of a core network?	BTL1	Remembering	CO5
4.	Define the term Software-Defined Networking (SDN)?	BTL1	Remembering	CO5
5.	What is an SDN controller?	BTL1	Remembering	CO5
6.	List the applications of SDN.	BTL1	Remembering	CO5
7.	What is meant by a Data Plane?	BTL1	Remembering	CO5
8.	What is meant by a Control Plane?	BTL1	Remembering	CO5
9.	Define the term Honeypots.	BTL1	Remembering	CO5
10.	What are the functions of Firewall?	BTL2	Understanding	CO5
11.	List out the types of Firewall	BTL1	Remembering	CO5
12.	What is an Intrusion Detection System?	BTL1	Remembering	CO5
13.	What are the classification of Intrusion Detection System?	BTL2	Understanding	CO5
14.	Give a simple comparison of IDS with Firewalls	BTL2	Understanding	CO5
15.	What are the key challenges of IDS implementation?	BTL2	Understanding	CO5
16.	Give the different Network Management functions.	BTL2	Understanding	CO5
17.	Mention any two general purpose SNMP operations that can be performed on scalar objects..	BTL2	Understanding	CO5
18.	List out few performance indicators in a Network Managementsystem.	BTL1	Remembering	CO5
19.	What is network management station? Write down the functionalities.	BTL1	Remembering	CO5
20.	How additional objects can be defined for a MIB?	BTL2	Understanding	CO5
21.	What are the objectives of MIB?	BTL1	Remembering	CO5
22.	What are the key capabilities of SNMP?	BTL2	Understanding	CO5
23.	State the key elements of the network management model.	BTL1	Remembering	CO5
24.	Differentiate between MDB and MIB.	BTL2	Understanding	CO5
1.	(i) Compare Edge vs. Core Network in detail.(8) (ii) Discuss the biggest challenge for designing an edge computing solution?(8)	BTL5	Evaluating	CO5
2.	(i) What is a core network and how does it work?(8) (ii) Discuss about the composition of an industrial edge computing architecture.(8)	BTL3	Applying	CO5
3.	(i) How Does Software-Defined Networking (SDN) Works?(8) (ii) Discuss the Components of Software Defining Networking.(8)	BTL4	Analyzing	CO5
4.	(i)Describe the SDN Architecture with neat sketch.(8) (ii) List out the Advantages and Disadvantages of SDN.(8)	BTL4	Analyzing	CO5
5.	(i) Difference between SDN and Traditional Networking.(8) (ii) Explain the Different Models of SDN in detail. (8)	BTL6	Creating	CO5
6.	Write short note on the following (i) Different types of Honeypots.(8) (ii) Benefits of a Honeypot.(8)	BTL3	Applying	CO5
7.	Describe the firewall design principles in detail.(16)	BTL4	Analyzing	CO5

8.	Explain the technical details of firewall and describe any three types of firewall with neat diagram.(16)	BTL6	Creating	CO5
9.	Explain firewalls and how they prevent intrusions.(16)	BTL5	Evaluating	CO5
10.	What are the positive and negative effects of firewall? Describe the familiar types of firewall configurations.(16)	BTL4	Analyzing	CO5
11.	Define intrusion detection and explain the different types of detection mechanisms in detail.(16)	BTL3	Applying	CO5
12.	Explain any two approaches for intrusion detection in detail.(16)	BTL4	Analyzing	CO5
13.	Explain the types of Host based intrusion detection. List any two IDS Software available.(16)	BTL4	Analyzing	CO5
14.	Explain the architecture of SNMP entity and traditional SNMP manager with neat diagram.(16)	BTL6	Creating	CO5
15.	Explain Network Management Software Architecture in detail.(16)	BTL3	Applying	CO5
16.	Explain the role of SNMP in Network Management in detail.(16)	BTL4	Analyzing	CO5
17.	Illustrate, with necessary diagrams, the configuration and role of SNMP. What are the 5 types of SNMP messages?(16)	BTL5	Evaluating	CO5

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