MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

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Rasipuram - 637 408, Namakkal Dist., Tamil Nadu

IQAC

Estd. 2000

MUST KNOW CONCEPTS	MKC
ECE	**2021-2022**

Course Code & Course Name		19ECC13 / COMPUTER NETWORKS		
Year/Sem/Sec		III/V/A,B&C		
S. No	**Term**	**Notation (Symbol)**	**Concept/Definition/Meaning/Units/Equation/Expression**	**Units**
			UNIT I NETWORK COMPONENTS	
1.	Computer Networks		An interconnection of autonomous computers connected together using transmission media.	
2.	Need for networking the computers		Sharing of information, Reliability, Reduces cost, Time saving	
3.	ARPANET		Advanced Research Projects Agency Network	
4.	Data transmission modes		Simplex Half Duplex Full Duplex	
5.	Simplex		The data can be transferred in only one direction	
6.	Half Duplex		The data can be transferred in both directions but one at a time.	
7.	MODEM		MODulatorDEModulator- The device can convert an analog signal into digital and vice versa.	
8.	Bandwidth		The range of frequencies thet is available for the transmission of data.	
9.	Types of transmission media		Guided Media Unguided Media	
10.	Advantages of twisted pair cable		1. Inexpensive 2. Often available in existing phone system 3. Well tested	
11.	Disadvantages of twisted pair cable		1. Susceptible to noise 2. Not as durable as coaxial cable 3. Does not support high speed	
12.	Communication protocol		Set or rules to enable computers to connect with one another and to exchange information with minimum possible errors.	
13.	Functions of communication protocol		Data sequencing, Data formatting, flow control, error control, connection establishment, data security.	
14.	List of protocols		HTTP, TCP/IP, FTP, SLIP, PPP, SMTP, POP, ICMP	
15.	Main functions of TCP		It breaks the data into packets that the network verifies that all the packets arrived at the destination.	
16.	Network topology		Topology is how the nodes/computers are interconnected together	

17.	Types of Networks		LAN, MAN, WAN	
18.	Networking topologies in LAN		Star, Ring, Bus, Mesh	
19.	NFS		Network File System-It allows a set of computers to access each other files.	
20.	Remote Networking		It uses TERMINAL services to communicate with the remote users such WAN.	
21.	Point to Point Protocol		To connect computer to remote networking services include Internet Service Providers.	
22.	Baseband		Bidirectional transmission while broadband is a unidirectional transmission.	
23.	Broadband		No frequency division multiplexing possible in base band but possible in broadband/	
24.	Layers of ISO OSI Model		Physical, Data Link, Network, Transport, Session, Presentation and Application Layer	
25.	FDM		Frequency Division Multiplexig	
UNIT II DATA LINK LAYER				
26.	Node		A piece of hardware on the system that can be addressed by a message from another node.	
27.	Hub		To simplify wiring of nodes to each other and to route signals between the nodes.	
28.	Backbone		A high capacity link to which many nodes or hub can be connected and to carry lots of traffic.	
29.	Router		Special computers that direct communicating messages when several networks are connected together.	
30.	Bridge		An interface used to connect the same type of networks	
31.	Gateway		An interface permitting communication between dissimilar networks for instance between LAN and WAN.	
32.	Metro Ethernet		Ethernet to connect multiple locations of the business to a network in terms of speed, security and cost	
33.	Carrier Ethernet		It is used to provide communication point to point communication between two points or sites or to provide links.	
34.	DA		Destination Address-Identifies receiver that should receive the data	
35.	SA		Source Address-I identifies the source address.	
36.	ARQ		Automated Repeat Request-Retransmission of data in three cases-Damaged Frame, Lost Frame, Lost Acknowledge	
37.	Responsibilities of Data Link Layer		Framing, Physical Addressing, Flow Control, Error Control, Access Control	
38.	Three Protocols used for noisy channels		1. Stop and Wait ARQ 2. Go Back N ARQ 3. Selective Repeat ARQ	
39.	CSMA/CD		Carrier Sense Multiple Access with Collision Detection	
40.	Flow Control		1. Set of procedures used to restrict the amount of	

			data the sender can sent before waiting for acknowledgement	
41.	Categories of Flow control		Stop & Wait Sliding Window	
42.	Disadvantages of Stop & wait protocol		Inefficiency Slow Process	
43.	Functions of data link layer		Flow Control Error Control	
44.	Link Discipline		It determines which device can send and when it can send	
45.	Polling		When the primary device is ready to receive data, it asks the secondary to send data.	
46.	Random Access Methods		Slotted ALOHA CSMA CSMA/CD, CSMA/CA	
47.	Piconet		A Bluetooth network is called Piconet	
48.	Frequency range of Bluetooth devices		2.4 GHz	
49.	Need of frame delay		It is a virtual circuit wide area network that was designed to respond to demands for a new type of WAN.	
50.	Maximum length of datagram		65,535 bytes	
UNIT III NETWORK LAYER				
51.	Responsibilities of Network layer		Logical Addressing Routing	
52.	DHCP		Dynamic Host Configuration Protocol- To provide dynamic configuration	
53.	ICMP		Internet Control Message Protocol- Collection of error messages that are sent back to the source host.	
54.	BOOTSTRAP		A Client/server protocol designed to provide IP address, Subnet mask, IP address of a router, IP address of a name server	
55.	Need of internetwork		T exchange data between networks need to be connected to make an internetwork	
56.	Types of class full addressing		Class A, Class B, Class C, Class D, Class E	
57.	ARP		Address Resolution Protocol-maps an MAC address to a IP address	
58.	RARP		Reverse Address Resolution Protocol- maps an MAC address to a IP address	
59.	Types of delivery		Direct Delivery Indirect Delivery	
60.	Unicast		One source sending a packet to one destination	
61.	Multicast		One source sending a packet to multiple destination	
62.	Forwarding		It requires a host or a router to have a routing table	
63.	Common notations for		Binary notations	

	address		Dotted decimal notations	
64.	Static mapping		It creating a table associates an IP address with a MAC address	
65.	Direct Delivery		Source and destination node belongs to a same network	
66.	Indirect Delivery		Source and destination node belongs to different network	
67.	Fragmentation		Division of a datagram into smaller units to a accommodate the MTU of a data link protocol	
68.	Packet Loss		When network links become congested and routers, switches start dropping packets	
69.	Jitter		The result of network congestion, timing drift and route changes	
70.	Latency		It takes a packet to travel from its source to its destination.	
71.	RSVP		Resource Reservation Protocol	
72.	MPLS		Multiprotocol Label Switching- It offers end to end Qos along a single path	
73.	SD-WAN		Monitors the state of current network connections for performance issues and uses its multiple connectivity.	
74.	Congestion management		Determine which queue to place the packets in	
75.	Congestion avoidance		Monitor network traffic for congestion and will drop low priority packets.	
UNIT IV TRANSPORT LAYER				
76.	Responsibilities of Transport Layer		Service-point Addressing Segmentation and reassembly Connection Control Flow Control Error Control	
77.	Types of congestion control		Open loop congestion control Closed loop congestion control	
78.	Quality of service		defines a set of attributes related to the performance of the connection.	
79.	Techniques to improve QOS		Scheduling Traffic shaping Resource reservation Admission control	
80.	Socket address		The combination of IP address and port address	
81.	Types of protocols used in Transport layer		TCP UDP	
82.	Throughput		It is defines as a number of packets passing through the network in a unit of time	
83.	UDP		User datagram protocol is a Unreliable, connectionless protocol, used along with the IP protocol	
84.	Types of port numbers used in transport layer		Well-known port Registered port Dynamic port	
85.	Three types of addresses in		physical address, the internetwork address (IP	

	TCP/IP		address), and the port address	
86.	flow characteristics related to QOS		Reliability Delay Jitter Bandwidth	
87.	MIME		Supplementary protocol that allows non ASCII data to be sent through SMTP	
88.	Congestion control		It involves preventing too much data from being injected into the network, thereby causing switches or links to become overloaded	
89.	Segmentation		The data received from the upper layer is too long for the network layer datagram or data link layer frame to handle, the transport protocol divides it into smaller usable blocks	
90.	Concatenation		The sign of the data unit belonging to single session are so small that several can fit together into a single datagram/frame, the transport protocol combine into single unit. This combining process is termed as Concatenation	
91.	Gate Way		A device used to connect different networks using different communication protocols	
92.	RED		Random Early Detection in each router is programmed to monitor its own queue length and when it detects the congestion is imminent ,to notify the source to adjust its congestion window	
93.	Silly Window Syndrome		If the sender or the receiver application program processes slowly and can send only one byte of data at a time, then the overhead is high. This is because, to send only one byte of data,20 bytes of TCP header and 20 bytes of IP header are to be sent. This is called silly window syndrome	
94.	Three way handshaking		A three-way handshake is a method used in a TCP/IP network to create a connection between a local host/client and server. It is a three-step method that requires both the client and server to exchange SYN and an ACK (acknowledgment) packet before actual data communication begins.	
95.	Choke packet		A specialized packet that is used for flow control along a network. A router detects congestion by measuring the percentage of buffers in use, line utilization and average queue lengths. When it detects congestion, it sends choke packets across the network to all the data sources associated with the congestion.	
96.	Duties of transport layer		Transport Layer. The transport layer is a 4th layer from the top. The main role of the transport layer is to provide the communication services directly to the application processes running on different hosts. The transport layer provides a logical communication between application processes running on different hosts.	

97.	User related attributes		User attributes provide a customized experience for each Looker user. A Looker admin defines a user attribute and then applies a user attribute value to a user group or to individual users. Admins can also define user attributes for which the users themselves provide values, such as passwords or contact information.	
98.	Congestion be avoided		A choke packet is used in network maintenance to prevent the congestion of a network	
99.	Function of BECN BIT		The BECN bit essentially advises the originating FRAD to reduce the frame transmission rate, if it is capable of doing so, as the network may be forced to discard frames once the notification is posted. Forward explicit congestion notification (FECN) performs a congestion control function in the forward direction.	
100.	Function of FECN		Forward Explicit Congestion Notification (FECN) is a networking function that is added to a received frame and lets the receiver know that congestion is occurring. Although the problem is the sender's responsibility, the receiver can inform the sender to implement congestion avoidance procedures.	
UNIT V APPLICATION LAYER AND SECURITY				
101.	Proxy commands		allows one to copy files from any machine to any other arbitrary machine	
102.	DNS		Domain name service is the method by which Internet address in mnemonic form such assun.it.ac.in are converted into the equivalent numeric IP address such as 134.220.4.1	
103.	Generic Domains		Generic domain define registered hosts according to their generic behaviour. Each node in the tree defines a domain, which is an index to the domain name space database	
104.	File transfer protocol		Control connection Open connection	
105.	HTTP transaction		Request messages Response messages	
106.	TFTP		Trivial File Transfer Protocol. TFTP provides an inexpensive mechanism that does not need complex interactions between the client and the server	
107.	URL		Standard for specifying any kind of information on the internet	
108.	DNS		Domain name service –Address to Identify hosts	
109.	TLS		Transport Layer Security-Security services that can be layered on the top of a transport protocol like TCP.It is often used by HTTP to perform secure transactions on the world wide web.	

110.	SMTP		Simple mail Transfer protocol - TCP/IP protocol supports electronic mail on the internet is called SMTP	
111.	Domain name system		DNS can map a name to an address and conversely an address to name	
112.	Digital Signature		Method to authenticate the sender of a message	
113.	Permutation		It is transposition in bit level. Straight Permutation, Compressed Permutation, Expanded Permutation	
114.	CGI		It is a std for communication between HTTP servers and executable programs. It is used in crating dynamics documents	
115.	PGP		Pretty good Privacy-provide security for electronic email. It provides authentication, confidentiality, data integrity and non repudiation	
116.	SSH		Secure Shell provides is used to provide a remote login, and used to remotely execute commands and transfer files and also provide strong client/server authentication/ message integrity	
117.	IMAP		Internet message Access Protocol is a standard protocol for accessing email from your local server	
118.	UA Vs MTA		UA prepares the message, creates the envelope and puts the message in the envelope MTA transfers the mail across the internet	
119.	Kerberos		Kerberos is a computer-network authentication protocol that works on the basis of tickets to allow nodes communicating over a non-secure network to prove their identity to one another in a secure manner.	
120.	Symmetric key different from the public key		The main difference between them is that in Symmetric Key Cryptography, only one key is put into use for encryption and decryption. On the other hand, in the case of Public Key Cryptography, they make use of two different keys. The public key for encryption and the private key for decryption.	
121.	Three main divisions of the DNS		. The domain name space is divided into three different sections: generic domains, country domains, and inverse domain.	
122.	Need POP3 or IMAP4 for E-mail		IMAP is better if you are going to be accessing your email from multiple devices, such as a work computer and a smart phone. POP3 works better if you are only using one device, but have a very large number of emails. It is also better if you have a poor internet connection and need to access your emails offline.	
123.	Cipher text and plaintext		Plaintext – information that can be directly read by	

7

			humans or a machine Ciphertext – the encrypted data	
124.	Format of HTTP response message		1. A Status-line. 2. Zero or more header (General|**Response**|Entity) fields followed by CRLF. 3. An empty line (i.e., a line with nothing preceding the CRLF) indicating the end of the header fields. 4. Optionally a **message**-body.	
125.	Format of HTTP request message		1. A Request-line. 2. Zero or more header (General|Request|Entity) fields followed by CRLF. 3. An empty line (i.e., a line with nothing preceding the CRLF) indicating the end of the header fields.	

GENERAL/INTERVIEW QUESTIONS

1.	Network		A network is a set of devices connected to each other using a physical transmission medium	
2.	Node		Two or more computers are connected directly by an optical fiber or any other cable	
3.	Network Topology		Network Topology is a physical layout of the computer network and it defines how the computers, devices, cables etc are connected to each other.	
4.	Routers		The router is a network device that connects two or more network segments	
5.	HTTP		HTTP is HyperText Transfer Protocol and it is responsible for web content	
6.	Firewall		Firewall is a network security system that is used to protect computer networks from unauthorized access	
7.	DNS		Domain Name Server (DNS), in a non-professional language and we can call it as Internet's phone book	
8.	NIC		Network Interface Card. It is also known as Network Adapter or Ethernet Card. It is in the form of an add-in card and is installed on a computer so that the computer can be connected to a network.	
9.	Discrete time system		A discrete or an algorithm that performs some prescribed operation on a discrete time signal.	
10.	Data Encapsulation		To enable data transmission from one computer to another, the network devices send messages in the form of packets	
11.	VPN		VPN is the Virtual Private Network and is built on the Internet as a private wide area network	
12.	Piggybacking		In data transmission if the sender sends any data frame to the receiver then the receiver should send	

			the acknowledgment to the sender	
13.	Encapsulation and De-capsulation		To send a message from one application program to another, the TCP/UDP protocol encapsulates and de-capsulate messages	
14.	Cryptography		The science and art of manipulating messages to make them secure	
15.	Authentication		It means that the receiver is sure of the sender identity	
16.	Encryption		The process of converting plain text to cipher text.	
17.	Symmetric key cryptography		In Symmetric key cryptography both the parties will use the same key.	
18.	OSI		Open system interconnection model is a model for understanding and designing a network architecture. It is not a protocol.	
19.	Multiple Access		If the physical links are shared by more than two nodes	
20.	Switch		Switches are hardware or software devices capable of creating temporary Connections between two or more devices	
21.	Packet switching		In packet switching data are transmitted in discrete units of potentially variable length blocks called Packets	
22.	DSL		It is a new technology that uses the existing telecommunication network to accomplish high speed delivery of data, voice & video etc.	
23.	Simplex		Communication can take place only in one direction. eg. T.V broadcasting.	
24.	Half-duplex		half-duplex communication means that at a time data can flow from A to B or from B to A but not simultaneously	
25.	Full-duplex		Communication can take place simultaneously in both directions. eg. A discussion in a group without discipline.	
LABORATORY QUESTIONS				
26.	Network		A network is a set of devices connected by physical media links.	
27.	Link		At the lowest level, a network can consist of two or more computers directly connected by some physical medium such as coaxial cable or optical fiber	
28.	node		A network can consist of two or more computers directly connected by some physical medium such as coaxial cable or optical fiber	
29.	gateway or Router		A node that is connected to two or more networks is commonly called as router or Gateway	
30.	factors that affect the security of the network		1.Unauthorized Access 2. Viruses	
31.	Protocol		A protocol is a set of rules that govern all aspects of information communication	
32.	key elements of protocols		Syntax, Semantics, Timing	
33.	Design issues of a computer Network		1.Connectivity 2. Cost-effective Resource Sharing	

		3. Support for common Services 4. Performance	
34.	layers of OSI		1. Physical Layer 2. Data Link Layer 3. Network Layer 4. Transport Layer 5. Session Layer 6. Presentation Layer 7. Application Layer	
35.	Network support layers		1. Physical Layer 2. Data link Layer 3. Network Layers	
36.	Categories of Transmission media		1. Guided Media 2. Unguided Media	
37.	Redundancy		The concept of including extra information in the transmission solely for the purpose of comparison	
38.	Checksum		Checksum is used by the higher layer protocols (TCP/IP) for error detection	
39.	Forward Error Correction		The process in which the receiver tries to guess the message by using redundant bits	
40.	Retransmission		The receiver detects the occurrence of an error and asks the sender to resend the message	
41.	Cyclic Codes		Cyclic codes are special linear block codes with one extra property	
42.	Flow Control		A set of procedures used to restrict the amount of data that the sender can send before waiting for acknowledgment	
43.	Error Control		It allows the receiver to inform the sender of any frames lost or damaged in transmission and coordinates the retransmission of those frames by the sender	
44.	Automatic Repeat Request		Any time an error is detected in an exchange, specified frames are retransmitted	
45.	Stop-and-Wait Protocol		In Stop and wait protocol, sender sends one frame, waits until it receives confirmation from the receiver and then sends the next frame	
46.	Pipelining		In networking and in other areas, a task is often begun before the previous task has ended.	
47.	Types of transmission technology		(i) Broadcast (ii) point-to-point	
48.	subnet		A generic term for section of a large networks usually separated by a bridge or router	
49.	Possible ways of data exchange		(i) Simplex (ii) Half-duplex (iii) Full-duplex.	
50.	SAP		Series of interface points that allow other computers to communicate with the other layers of network protocol stack	
Faculty Team Prepared		Mrs.P.Padmalochini ASP/ECE., Ms.S.Priya AP/ECE	Signatures	