INSTITUTE OF AERONAUTICAL ENGINEERING

Autonomous

Dundigal, Hyderabad - 500 043

COMPUTER SCIENCE AND ENGINEERING

TUTORIAL QUESTION BANK

Course Name	**COMPUTER NETWORKS**
Course Code	**A50515**
Class	III B. Tech I Semester
Branch	Computer Science and Engineering
Year	2017 –18
Course Coordinator	Mr P. Ravinder, Assitstant Professor
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OBJECTIVES:

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome-based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

PART - A (SHORT ANSWER QUESTIONS)

S. No.	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – I		
1.	**Define** Network?	Knowledge	1
2.	**Explain** different types of networks?	Understand	2
3.	**Describe** Why are protocols needed?	Understand	2
4.	**Describe** Access point?	Understand	1
5.	**State** the goals of networks?	Knowledge	2
6.	**Describe** the importance of networking?	Understand	1
7.	**Lis**t two advantages of layering principle in computer networks?	Knowledge	2
8.	**Classify** different types of Layers?	Understand	2
9.	**Define** the responsibilities of data link layer?	Knowledge	1
10.	**Enumerate** the types of errors?	Knowledge	1
11.	**Explain** the role of ARPANET in computer networks?	Understand	2
12.	**Discuss** two points to improve the performance of network?	Understand	1
13.	**Define** redundancy?	Knowledge	2
14.	**List** different types of Transmission Media?	Knowledge	2
15.	**Describe** Why are standards needed?	Understand	1
16.	**Explain** briefly about MAN?	Understand	1
17.	**Explain** about Sliding Window Protocol?	Understand	2
18.	**Explain** briefly about WAN?	Understand	2
19.	**Define** peer-to-peer process?	Knowledge	1
20.	**Describe** an internet?	Understand	2
21.	**Define** Intranet?	Knowledge	3
22.	**Define** Extranet?	Knowledge	1
23.	**Explain** briefly about LAN?	Understand	1
24.	**Describe** the advantages of a multipoint connection over a	Understand	2

	point-to-point connection?		
25.	**List** out the available detection methods?	Knowledge	2
26.	**Discuss** the responsibilities of the data link layer in the Internet model?	Understand	1
27.	**Discuss** How do the layers of the Internet model correlate to the layers of the OSI model?	Understand	1
28.	**Differentiate** four basic topologies?	Understand	1
29.	**Define** VRC, LRC, and CRC?	Knowledge	2
30.	**List** the advantages of CN?	Knowledge	1
31.	**List** the networks Applications?	Knowledge	1
32.	**Define** checksum?	Knowledge	2
	UNIT – II		
1.	**Define** ALOHA?	Knowledge	4
2.	**List** out advantage of token passing protocol over CSMA/CD protocol?	Knowledge	5
3.	**Define** MAC?	Knowledge	5
4.	**List** the drawbacks of token ring topology?	Knowledge	3
5.	**Define** Ethernet?	Knowledge	3
6.	**Illustrate** in what way the MAC protocol of FDDI differs from that of token ring ?	Apply	4
7.	**Explain** how FDDI offers higher reliability than token ring protocol?	Understand	4
8.	**Explain** the two techniques for implementing Ethernet switches?	Understand	4
9.	**Define** Bridge?	Knowledge	4
10.	**Define** Hub?	Knowledge	4
11.	**Define** Router?	Knowledge	5
12.	**Explain** in what situations contention based MAC protocols are suitable?	Understand	4
13.	**Illustrate** What is vulnerable period? How it affects the performance in MAC protocols?	Apply	4
14.	**List** three categories of multiple access protocols?	Knowledge	5
15.	**Define** CSMA and CDMA?	Knowledge	
16.	**Define** parameter 'a'? How does it affect the performance of the CSMA protocol?	Knowledge	5
17.	**Explain** how performance is improved in CSMA/CD protocol compared to CSMA protocol?	Understand	3
18.	**Explain** how throughput is improved in slotted ALOHA over pure ALOHA?	Understand	4
19.	**Explain** Vulnerable Time?	Understand	5
20.	**Distinguish** between FDMA and TDMA?	Understand	3
21.	**Define** Bandwidth?	Knowledge	5
	UNIT – III		
1.	**Explain** Design Issues Of Network layer?	Understand	6
2.	**List** network support layers and the user support layers?	Knowledge	7
3.	**Define** the functions of LLC?	Knowledge	7
4.	**Illustrate** shortest path?	Apply	6
5.	**Define** Flooding?	Knowledge	6
6.	**Explain** Optimality principle?	Understand	6
7.	**Define** the functions of MAC?	Knowledge	7
8.	**Define** protocol data unit?	Knowledge	4
9.	**Explain** Congestion Control?	Understand	7
10.	**Define** virtual circuit?	Knowledge	6
11.	**List** out responsibilities of network layer?	Knowledge	6
12.	**Define** datagram's?	Knowledge	7
13.	**Explain** how broadcast and multicast address is represented in IP addressing scheme?	Understand	6
14.	**List** some of the unicast routing protocols?	Knowledge	7
15.	**Differentiate** between Datagram and datagram networks?	Understand	7
16.	**Define** routers?	Knowledge	6
17.	**Differentiate** between virtual circuit and virtual circuit networks?	Understand	6
18.	**List** out functions of IP?	Knowledge	7

19.	**Explain** what is meant by routing algorithm?	Understand	7
20.	**Define** session routing?	Understand	6
21.	**Define** Flooding?	Knowledge	6
22.	**Define** Link state Routing?	Knowledge	7
23.	**State** Leaky bucket?	Knowledge	7
24.	**Explain** Choke packet?	Understand	7
25.	**Define** packet switching?	Knowledge	6
26.	**State** circuit switching?	Knowledge	7
27.	**Illustrate** the routing strategies?	Apply	6
	UNIT - IV		
1.	**List** out functions of transport layer?	Knowledge	9
2.	**Define** Multi-protocol router?	Knowledge	
3.	**List** out duties of the transport layer?	Knowledge	8
4.	**Define** BGP?	Knowledge	
5.	**Differentiate** between network layer delivery and the transport layer delivery?	Understand	8
6.	**Define** IP Address?	Knowledge	
7.	**Define** quality of service?	Knowledge	8
8.	**Explain** Subnet Mask?	Understand	
9.	**Define** PayLoad?	Knowledge	9
10.	**Explain** how an application process running in one host is addressed by another process through TCP?	Understand	8
11.	**Describe** Datagram Format of UDP?	Understand	
12.	**Define** IMCP?	Knowledge	9
13.	**State** two protocols available at transport layer?	Knowledge	9
14.	**List** out various congestion avoidance techniques?	Knowledge	8
15.	**Distinguish** between Contention and Congestion?	Understand	9
16.	**Define** Tunnelling?	Knowledge	8
17.	**State** the four major aspects of reliable delivery at the transport layer?	Knowledge	8
18.	**Explain** how check sum is calculated in TCP?	Understand	9
19.	**Explain** CODE BITS in TCP header?	Understand	9
20.	**State** the use of SYN and FIN bits in TCP?	Knowledge	8
21.	**Define** RARP?	Knowledge	9
22.	**Explain** DHCP?	Understand	9
23.	**Explain** about Transport Layer Services?	Understand	8
24.	**Discuss** Types of Payload?	Understand	8
25.	**Define** Multiplexing?	Knowledge	9
26.	**Explain** how connection Establishment is acquiring?	Understand	8
27.	**Explain** how to release a connection from the network?	Understand	9
28.	**Explain** crash Recovery?	Understand	9
	UNIT - V		
1.	**Explain** Internet Transport Protocols?	Understand	10
2.	**Define** UDP?	Knowledge	10
3.	**State** advantages of stateless server of HTTP?	Knowledge	10
4.	**Define** message Formatting?	Knowledge	10
5.	**Define** TCP?	Knowledge	10
6.	**Differentiate** between FTP & HTTP?	Understand	10
7.	**Explain** TCP segment Header?	Understand	10
8.	**Explain** Sliding Window Protocol?	Understand	10
9.	**List** two applications of Application Layer ?	Knowledge	10
10.	**Explain** DNS Name Space?	Understand	10
11.	**List** the advantages of Email?	Knowledge	10
12.	**Define** SMTP?	Knowledge	10
13.	**Explain** the concept of Telnet?	Understand	9
14.	**Define** FTP?	Knowledge	5
15.	**Explain** MIME?	Understand	10
16.	**Illustrate** the use of MIME Extension?	Apply	10
17.	**Explain** WWW?	Understand	6
18.	**Define** Lossy Compression and Lossless Compression?	Knowledge	9

PART -B (LONG ANSWER QUESTIONS)

S. No.	Question	Blooms Taxonomy Level	Course Outcome
	UNIT - I		
1.	**Explain** how are OSI and ISO related to each other?	Understand	1
2.	**Illustrate** some of the factors that determine whether a communication system is a LAN or WAN?	Apply	2
3.	**List** the responsibilities of the data link layer in the Internet model?	Knowledge	2
4.	Suppose a computer sends a frame to another computer on a bus topology LAN. The physical destination address of the frame is corrupted during the transmission. What happens to the frame? How can the sender be informed about the situation? **Explain**?	Understand	1
5.	**List** three types of transmission impairment?	Knowledge	1
6.	**Distinguish** between baseband transmission and broadband transmission?	Understand	2
7.	**Explain** the categories of networks?	Understand	2
8.	**Explain** ISO/OSI Reference model with neat diagram?	Understand	1
9.	**Define** topology and explain the topologies of the network?	Knowledge	2
10.	**Explain** error detection and error correction techniques?	Understand	1
11.	**Explain** the flow control mechanism?	Understand	2
12.	**Explain** about HDLC?	Understand	1
13.	**Explain** the timers and time registers in FDDI?	Understand	1
14.	**Explain** error control mechanism?	Understand	2
15.	**Explain** about SONET and Bridges?	Understand	1
	UNIT – II		
1.	**State** the functions of MAC?	Knowledge	3
2.	How performance is improved in CSMA/CD protocol compared to CSMA protocol? **Explain**?	Understand	4
3.	How CSMA/CA differs from CSMA/CD. **Explain** in brief?	Understand	5
4.	**Explain** in details about the access method and frame format used in Ethernet and token ring?	Understand	4
5.	**Explain** the working of carrier sense multiple access protocol?	Understand	5
6.	**Discuss** the MAC layer functions of IEEE 802.11?	Understand	4
7.	**Explain** in details the types of bridges?	Understand	5
8.	How a Token Ring LAN does operate? **Discuss** that can be used to set up wireless LAN's?	Understand	5
9.	**List** and briefly discuss the two different basic transmission technologies?	knowledge	5
10.	**List** the four basic network topologies and explain them giving all the Relevant features?	knowledge	4
11.	**Explain** the frame format, operation and ring maintenance feature of IEEE 802.5 MAC protocol?	Understand	4
12.	**Define** key requirements and functioning of wireless LANs?	Knowledge	5
13.	**Explain** why collision is an issue in a random access protocol but not in controlled access or channelizing protocols ?	Understand	4
14.	**Compare** and contrast a controlled access protocol with a channelizing protocol?	Understand	4
15.	Do we need a multiple access protocol when we use the local loop of the telephone company to access the internet? **Explain**?	Understand	5
	UNIT – III		
1.	**Define** switching? Explain Virtual circuit switching techniques?	Knowledge	7
2.	**Explain** Packet switching technique in detail?	Understand	6
3.	**Explain** Internet Protocol with the neat block diagram of IP header format?	Understand	7
4.	**Discuss** about Address Resolution Protocol?	Understand	7
5.	**Explain** about Internet Control Message Protocol?	Understand	6

S. No.	Question	Blooms Taxonomy Level	Course Outcome
6.	**Define** BGP Protocol. Describe its routing functionality in detail?	Knowledge	7
7.	**Write** short notes on a) X.25 b) ARP?	Knowledge	6
8.	**Explain** the various congestion control mechanism in detail?	Understand	6
9.	**Explain** the Link State routing algorithm with an example?	Understand	6
10.	**Describe** the Routing Information protocol and Distance vector routing protocol?	Understand	7
11.	**Explain** the Datagram delivery and Forwarding in Internet Protocol?	Understand	6
12.	**Explain** the two approaches of packet switching techniques?	Understand	7
13.	**Define** Routers and explain the type of routers?	Knowledge	6
14.	**Explain** IP addressing method?	Understand	7
15.	**Describe** two groups of multicast routing protocols?	Understand	6
	UNIT - IV		
1.	**Explain** the real transport protocol of UDP and how will you calculate checksum in UDP?	Understand	8
2.	**Explain** the TCP segment format?	Knowledge	9
3.	**Write** short notes on Wrap around time (8)?	Knowledge	9
4.	**Describe** the Adaptive retransmission policy in detail?	Understand	8
5.	**Explain** the TCP Connection establishment and termination using Timeline diagram?	Understand	8
6.	**Describe** the three way handshake protocol to establish the transport level connection?	Understand	9
7.	**Explain** TCP state Transition diagram?	Understand	8
8.	**Explain** the connection establishment?	Understand	9
9.	**Discuss** about the TCP sliding window algorithm for flow control?	Understand	8
10.	**Explain** congestion control algorithms in detail?	Understand	9
11.	**Explain** leaky bucket and token bucket algorithm?	Understand	8
12.	**Explain** UDP &TCP?	Understand	9
13.	**Explain** congestion avoidance techniques in detail?	Understand	8
14.	**List** major types of networks and explain?	Knowledge	9
15.	**Illustrate** data units at different layers of the TCP / IP protocol suite?	Apply	8
	UNIT – V		
1.	**List** different Data types used for Presentation formatting?	knowledge	10
2.	**Define** two methods of HTTP?	knowledge	10
3.	**Define** Big-endian format and little-endian format?	knowledge	10
4.	**Describe** the role of the local name server and the authoritative name server in DNS?	Understand	10
5.	**Define** Domain Name Service (DNS) and explain in detail about the domain hierarchy and name servers?	knowledge	10
6.	**Explain** in detail about the working principles of Simple Network Management Protocol (SNMP) ?	Understand	10
7.	**Discuss** how the Simple Mail Transfer Protocol (SMTP) is useful in electronic mail?	Understand	10
8.	**Describe** in detail about the World Wide Web (WWW) ?	Understand	10
9.	**Explain** the working principle of FTP in detail with neat diagram?	Understand	10
10.	**Explain** the WWW in detail?	Understand	10
11.	**Differentiate** between ARP and RARP?	Understand	10
12.	**Explain** the specific purposes of the DNS, HTTP, SMB, and SMTP/POP application layer protocols?	Understand	10
13.	**Compare** and contrast client/server with peer-to-peer data transfer over networks?	Understand	10

S. No.	Question	Blooms Taxonomy Level	Course Outcome
14.	**Explain** three domains of the Domain Name Space?	Understand	10
15.	**Differentiate** between primary server and secondary server?	Understand	10

PART -C (CRITICAL THINKING QUESTIONS)

S. No.	Question	Blooms Taxonomy Level	Course Outcome
	UNIT – I		
1.	Consider an I km 10Mbps channel. What would be the utilization of this channel when 100 nodes are connected in an Ethernet configuration? If the channel is converted to a ring, running token ring, what would be the utilization of the channel? **Assume** fixed frame size of 1024 bits in both cases.	Understand	2
2.	**Describe** in detail about the concept of data transmission and its terminology with necessary example?	Understand	2
3.	For P = 110011 and M = 1100011, **find CRC**?	Understand	2
4.	For each of the following four networks, **Discuss** the consequences if a connection fails? a) Six devices arranged in a bus topology b) Four devices arranged in a ring topology c) five devices arranged in a mesh topology d) Seven devices arranged in a star topology	Understand	1
5.	**Calculate** the hamming distance for each of the following code words? a) d(10000, 01000) b) d(10101, 10010) c) d(1111, 1111) d) d(0000, 0000)	Understand	1
	UNIT – II		
1.	**Derive** the Laplace transform of the message delay in FDMA in which every message contains a random number of packets. Compare the expected message delay with that of TDMA?	Understand	4
2.	A network with one primary and four secondary stations uses polling. The size of a data frame is 1000 bytes. The size of the poll, ACK,and NAK frames are 32 bytes each. Each station has 5 frames to send. **How** many total bytes are exchanged if there is no limitation on the number of frames a station can send in response to a poll?	Understand	3
3.	**Derive** the steady-state distribution and the first two moments of the number of messages in a TDMA system where L (z) is the generating function of the number of packets in a message?	Understand	5
4.	One hundred station on a pure **ALOHA** network share a 1-Mbps channel.if frames are 1000 bits long, **find** the throughput if each station is sending 10 frames/sec?	Understand	3
5.	**Assume** that a portion y of every transmitted packet is overhead (e.g., address, sync bits, etc.). 1. What will be the throughput delay characteristic of an FDMA channel? 2. What will be the throughput delay characteristic of a TDMA channel?	Understand	4
	UNIT – III		
1.	A Router has the following RIP routing table : Net 1 5 B Net 2 1 C Net 3 2 F Net 4 4 G **What** would be the contents of the table if the router received the following RIP message from router C? Net 1 2 Net 2 2	Understand	5

	Net 3 4 Net 4 8		
2.	A Router using DVMRP receives a packet with source address 10.14.17.2 from interface 2.If the router forwards the packet, **What** are the contents of the entry related to this address in the unicast routing table?	Understand	5
3.	A Frame goes from A to B. There is congestion in both directions. Is the FECN bit set? Is the BECN bit set? **Explain?**	Understand	6
4.	Show a routing table for a host that is connected to a LAN without being connected to a internet? **Explain?**	Understand	6
5.	**Design** the autonomous system with the following specifications : a) There are 8 networks (N1 to N8) b) There are 8 routers (R1 to R8) c) N1,N2,N3,N4,N5 and N6 are Ethernet LANs d) N7 and N8 are point to point WANs e) R1 connects N1 and N2 f) R2 connects N1 and N7 g) R3 connects N2 and N8	Understand	5
	UNIT - IV		
1.	**Write** the following MASKS in slash notation (/n)? a) 255.0.0.0 b) 255.255.224.0 c) 255.255.255.0 d) 255.255.240.0	Understand	7
2.	**Find** the class of the following IP addresses? a) 237.14.2.1 b) 208..35.54.12 c) 129.14.6.8 d) 114.34.2.8	Understand	7
3.	A router with IPV4 address 123.45.21.12 and Ethernet physical address 23:45: BA: 00:67: CD has received a packet for a host destination with IP address 124.10.78.10.Show the entries in the ARP request packet sent by the router. Assume no subnetting?	Understand	8
4.	An IPV4 datagram arrives with fragmentation offset of 0 and an M bit (more fragment bit) of 0.Is this a first fragment middle fragment or last fragment**?**	Understand	8
5.	An IPV4 fragment has arrived with an offset value of 100.How many bytes of the data were originally sent by the source before the data in this fragment**?**	Understand	8
	UNIT – V		
1.	A client uses UDP to send data to a server. The data are 15 bytes. **Calculate** the efficiency of this transmission at the UDP level (ratio of useful bytes to total bytes)?	Understand	9
2.	A TCP connection is using a window size of 12000 bytes and the previous acknowledgement number was 22001.It receives a segment with acknowledgment number 24001 and window size advertisement of 12000. **Design** a diagram to show the situation of the window before and after?	Understand	9
3.	**Determine** which of the following is an FQDN and which is a PQDN? a) mil b) edu c) xxx.yyy.net d) zzz.yyy.xxx.edu	Understand	9
4.	**Interpret** the following sequences of characters (In Hexa decimals) received by a TELNET client or server? a) FFFB01 b) FFFE01 c) FFF4 d) FFF9	Understand	9
5.	**Show** the sequence of bits sent from a client TELNET for the binary transmission of 11110011 00111100 11111111	Understand	9

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