INSTITUTE OF AERONAUTICAL ENGINEERING

Dundigal, Hyderabad - 500 043

INFORMATION TECHNOLOGY

QUESTION BANK

Course Title	**COMPUTER NETWORKS**			
Course Code	A50515			
Class	III B. Tech I Semester			
Branch	INFORMATION TECHNOLOGY			
Year	2017-2018			
Regulation	R15			
Course Structure	Lectures	Tutorials	Practical's	Credits
	4	-	-	4
Course Coordinator	Mr N. Bhaswanth, Assistant Professor			
Team of Instructors	Mr N. Bhaswanth, Assistant Professor			

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.

GROUP - A (SHORT ANSWER QUESTIONS)

S. No.	Question	Blooms Taxonomy Level	Course Outcomes
	UNIT – I		
	Overview of the Internet, Physical Layer, Data Link Layer		
1.	**Define** Network	Knowledge	1
2.	**Explain** different types of networks	Understand	2
3.	**Why** are protocols needed	Knowledge	2
4.	**Describe** Access point	Knowledge	1
5.	**State** the goals of networks	Knowledge	2
6.	**Describe** the importance of networking	Knowledge	1
7.	**Lis**t two advantages of layering principle in computer networks	Knowledge	2
8.	**Classify** different types of Layers	Understand	2
9.	**What** are the responsibilities of data link layer	Understand	1
10.	**Mention** the types of errors	Understand	1
11.	**Explain** the role of ARPANET in computer networks	Knowledge	2
12.	**Suggest** two points to improve the performance of network.	Knowledge	1
13.	**What** is redundancy	Knowledge	2
14.	**List** different types of Transmission Media	Knowledge	2

15.	**Why** are standards needed	Knowledge	1
16.	**Explain** briefly about MAN	Understand	1
17.	**Explain** about Sliding Window Protocol	Understand	2
18.	**Explain** briefly about WAN	Understand	2
19.	**Why** are standards needed	Knowledge	1
20.	**What** is a peer-to-peer process	Understand	1
21.	**What** is an internet	Knowledge	2
22.	**Define** Intranet	Knowledge	3
23.	**Define** Extranet	Knowledge	1
24.	**Explain** briefly about LAN	Understand	1
25.	**What** are the advantages of a multipoint connection over a point-to-point connection	Knowledge	2
26.	**List** out the available detection methods	Knowledge	2
27.	**What** are the responsibilities of the data link layer in the Internet model	Understand	1
28.	**How** do the layers of the Internet model correlate to the layers of the OSI model	Knowledge	1
29.	**Categorize** the four basic topologies	Understand	1
30.	**Write** short notes on VRC, LRC, and CRC	Knowledge	2
31.	**List** the advantages of CN	Knowledge	1
32.	**List** the networks Applications	Knowledge	1
33.	**Define** checksum	Knowledge	2
UNIT – II			
Multiple Access Protocols			
1.	**Define** ALOHA	Knowledge	4
2.	**What** is the advantage of token passing protocol over CSMA/CD protocol	Understand	5
3.	**Define** MAC	Knowledge	5
4.	**What** are the drawbacks of token ring topology	Knowledge	3
5.	**Define** Ethernet	Knowledge	3
6.	**In what** way the MAC protocol of FDDI differs from that of token ring	K nowledge	4
7.	**How** FDDI offers higher reliability than token ring protocol	Knowledge	4
8.	**Explain** the two techniques for implementing Ethernet switches	Understand	
9.	**Define** Bridge	Knowledge	4
10.	**Define** Hub	Understand	4
11.	**Define** Router	Knowledge	5
12.	**In what** situations contention based MAC protocols are suitable	Knowledge	4
13.	**What** is vulnerable period? How it affects the performance in MAC protocols	Understand	4
14.	**List** three categories of multiple access protocols	Knowledge	5
15.	**Define** CSMA and CDMA	Knowledge	
16.	**What** is the parameter 'a'? How does it affect the performance of the CSMA protocol	Knowledge	5
17.	**How** performance is improved in CSMA/CD protocol compared to CSMA protocol	Knowledge	3
18.	**How** throughput is improved in slotted ALOHA over pure ALOHA	Knowledge	4
19.	**Explain** Vulnerable Time.	Understand	5
20.	**Distinguish** between FDMA and TDMA	Knowledge	3
21.	**Define** Bandwidth	Knowledge	5
UNIT – III			
Network Layer			
1.	**Explain** Design Issues Of Network layer	Understand	5

2.	**What** are the network support layers and the user support layers?	Knowledge	3
3.	**What** are the functions of LLC	Knowledge	3
4.	**Illustrate** shortest path	Understand	4
5.	**Define** Flooding	Understand	2
6.	**Explain** Optimality principle	Understand	1
7.	**What** are the functions of MAC	Understand	3
8.	**What** is protocol data unit	Knowledge	4
9.	**Explain** Congestion Control	Understand	2
10.	**What** is a virtual circuit?	Knowledge	3
11.	**What** are the responsibilities of network layer?	Understand	3
12.	**What** are datagrams?	Understand	3
13.	**How** broadcast and multicast address is represented in IP addressing scheme?	Knowledge	3
14.	**List** some of the unicast routing protocols?	Knowledge	4
15.	**Differences** between Datagram and datagram networks	Understand	1
16.	**Define** routers	Knowledge	3
17.	**Difference** between virtual circuit and virtual circuit networks	Understand	3
18.	**List** out functions of IP	Knowledge	3
19.	**What** is meant by routing algorithm	Knowledge	2
20.	**What** is meant by session routing	Understand	3
21.	**Define** Flooding	Knowledge	3
22.	**Define** Link state Routing	Knowledge	4
23.	**State** Leaky bucket	Understand	5
24.	**Explain** Choke packet	Understand	3
25.	**What** is packet switching	Knowledge	3
26.	**What** is circuit switching	Understand	1
27.	**What** are the routing strategies	Knowledge	3
28.	**Define** count-to-infinity?	Knowledge	4
29.	**Explain** two node loop	Understand	1
30.	**Explain** split horizon	Understand	3
31.	**Explain** poison reverse	Knowledge	4
32.	**What** is congestion	Understand	5
33.	**What** is open loop congestion control	Knowledge	2
34.	**Explain** retransmission policy	Understand	4
35.	**Explain** window policy	Understand	1
36.	**Explain** Acknowledgment policy	Understand	2
37.	**What** is discarding policy	Knowledge	3
38.	**Explain** about admission policy	Knowledge	5
39.	**Define** closed loop congestion control	Understand	1
40.	**Illustrate** back pressure	Knowledge	2
41.	**Define** choke packet	Understand	3
42.	**Explain** implicit signalling	Knowledge	4
43.	**Explain** explicit signalling	Understand	5
44.	**What** is hierarchical routing	Knowledge	1
45.	**What** is QOS	Knowledge	2
46.	**What** is delay in congestion control	Understand	4
47.	**What** is throughput in congestion control	Illustrate	5
48.	**What** is distance vector	Understand	3
UNIT – IV			
Internetworking, Transport Layer			
1.	**What** is function of transport layer	Knowledge	1
2.	**Define** Multi-protocol router	Knowledge	4

3.	**What** are the duties of the transport layer	Understand	5
4.	**Define** BGP	Knowledge	3
5.	**What** is the difference between network layer delivery and the transport layer delivery	Understand	2
6.	**Define** IP Address	Knowledge	3
7.	What is meant by quality of service	Understand	4
8.	Explain Subnet Mask	Understand	3
9.	Define Pay Load	Understand	2
10.	How an application process running in one host is addressed by another process through TCP	Understand	3
11.	**Give** Datagram Format of UDP	Knowledge	5
12.	**Define** IMCP	Knowledge	4
13.	**Name** the two protocols available at transport layer	Understand	1
14.	**List** out various congestion avoidance techniques	Knowledge	2
15.	**Distinguish** between Contention and Congestion	Knowledge	3
16.	**Define** Tunnelling	Knowledge	4
17.	**What** are the four major aspects of reliable delivery at the transport layer	Understand	1
18.	**How** check sum is calculated in TCP	Illustrate	2
19.	**Explain** CODE BITS in TCP header	Understand	3
20.	**State** the use of SYN and FIN bits in TCP	Knowledge	5
21.	**Define** RARP	Understand	5
22.	**Explain** DHCP	Understand	1
23.	**Explain** about Transport Layer Services	Understand	2
24.	**Discuss** Types of Payload	Understand	3
25.	**Define** Multiplexing	Understand	5
26.	**How** connection Establishment is acquiring	Understand	4
27.	**How** to release a connection from the network	Understand	2
28.	**Explain** crash Recovery	Understand	1
UNIT – V			
Application Layer			
1	**Explain** Internet Transport Protocols	Understand	1
2	**Define** UDP	Understand	5
3	**What** are the advantages of stateless server of HTTP	Understand	4
4	**Define** message Formatting	Understand	2
5	**Define** TCP	U nderstand	3
6	**What** is the main difference between FTP & HTTP?	Understand	4
7	**Explain** TCP segment Header	Understand	1
8	**Explain** Sliding Window Protocol	Understand	2
9	**Write** any two applications of Application Layer	Understand	3
10	**Explain** DNS Name Space	Understand	5
11	**Give** the advantages of Email	Knowledge	4
12	**Define** SMTP	Knowledge	5
13	**Explain** the concept of Telnet	Understand	1
14	**Define** FTP	Knowledge	2
15	**Explain** MIME	Understand	3
16	**What** is the use of MIME Extension	Understand	3
17	**Explain** WWW	Understand	4
18	**Define** Lossy Compression and Lossless Compression	Knowledge	5

GROUP-B (LONG ANSWER QUESTIONS)

S. No.	Question	Blooms Taxonomy Level	Course Outcomes
UNIT - I			
Overview of the Internet,Physical Layer,Data Link Layer			
1	**How** are OSI and ISO related to each other	Illustrate	1
2	**What** are some of the factors that determine whether a communication system is a LAN or WAN	Knowledge	2
3	**What** are the responsibilities of the data link layer in the Internet model	Understand	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	Illustrate	1
5	**Name** three types of transmission impairment?	Understand	1
6	**Distinguish** between baseband transmission and broadband transmission	Illustrate	2
7	**Explain** the categories of networks	Understand	2
8	**Explain** ISO/OSI Reference model with neat diagram	Understand	1
9	**What** is meant by topology and explain the topologies of the network	Understand	2
10	**Explain** error detection and error correction techniques	Knowledge	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	Knowledge	2
15	**Explain** about SONET and Bridges	Knowledge	1
UNIT – II			
Multiple Access Protocols			
1	**What** are the functions of MAC	Understand	3
2	**How** performance is improved in CSMA/CD protocol compared to CSMA protocol	understand	4
3	**How** CSMA/CA differs from CSMA/CD. Explain in brief	Knowledge	5
4	**Explain** in details about the access method and frame format used in Ethernet and token ring.	Knowledge	4
5	**Explain** the working of carrier sense multiple access protocol.	Knowledge	5
6	**Discuss** the MAC layer functions of IEEE 802.11.	Knowledge	4
7	**Explain** in details the types of bridges	Apply	5
8	**How** a Token Ring LAN does operate? Discuss. that can be used to set up wireless LAN's	Knowledge	5
9	**List** and briefly discuss the two different basic transmission technologies	knowledge	5
10	**Name** the four basic network topologies and explain them giving all the Relevant features.	Understand	4
11	**Explain** the frame format, operation and ring maintenance feature of IEEE 802.5 MAC protocol.	Understand	4
12	**Briefly** define key requirements and functioning of wireless LANs	Knowledge	5
UNIT – III			
Network Layer			
1	**What** do you mean by switching? Explain Virtual circuit switching techniques	Illustrate	5

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

GROUP-III (ANALYTICAL QUESTIONS)

S. No.	Question	Blooms Taxonomy Level	Program Outcome
	UNIT – I		
	Overview of the Internet,Physical Layer,Data Link Layer		
1	**Explain** in detail the different transmission media and compare and contrast them of cost, speed, security, attenuation and other in terms of relevant characteristics	Understand	1
2	**Describe** in detail about the concept of data transmission and its terminology with necessary example	knowledge	2
3	**Why** sliding window flow control is considered to be more efficient than stop and wait flow control	Understand	2
4	**Distinguish** between forward error correction versus error correction by transmission	Knowledge	1
5	For P = 110011 and M = 1100011, **find CRC**	Understand	2
6	**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
7	**Explain** about the IEEE 802.5 token ring	Understand	1
8	**Discuss** in detail with the RS232 interfacing sequences	Understand	2
9	**Explain** line coding (digital to digital conversion)	Understand	1
10	**Explain** about SONET and Bridges	Understand	1
	UNIT – II		
	Multiple Access Protocols		
1	**Explain** the basic difference between IEEE 802.3 and switched Ethernet, as far as implementation is concerned.	Knowledge	3
2	**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.	Knowledge	4
3	**What** way the MAC protocol of FDDI differs from that of token ring	Understand	5
4	**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
5	**Explain** GMII (Gigabit Media Independent Interface) in brief	Understand	4
6	**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	Illustrate	4
7	**Describe** various fields in frame format of FDDI	Understand	3
8	**Compare** the first two moments of the distribution of the queueing time of FDMA with that of TDMA (Note: the queueing time does not include the actual transmission time)	Understand	5
9	**What** role the active token monitor performs	Knowledge	3
	UNIT – III		
	Network Layer		
1	**Explain** in detail about a) X.25 b) ARP	Illustrate	3
2	**Defin**e BGP Protocol. Describe its routing functionality in detail	knowledge	5
3	**Explain** the Datagram delivery and Forwarding in Internet Protocol	Illustrate	5
4	**Explain** Packet switching technique in detail	knowledge	5
5	**What** do you mean by switching? Explain Virtual circuit switching techniques	Understand	5
6	**Define** routing & explain distance vector routing and link state routing	knowledge	5
7	**Explain** in detail about repeaters, routers and gateways.	Understand	5
8	**What** is difference between layer 2 switch and Layer 3 Switch	Understand	5
9	**Difference** between subnet mask and default gateway	Understand	4
10	**Why** do we use Subnet mask. What are its uses	knowledge	3

UNIT - IV			
Internetworking,Transport Layer			
1	**Explain** the real transport protocol of UDP and how will you calculate checksum in UDP	Illustrate	1
2	**Describe** the Adaptive retransmission policy in detail	knowledge	2
3	The transport layer creates the connection between source and destination**. What** are the three events involved in the connection	knowledge	3
4	**What** is the difference between disaster recovery at the data link layer and the transport layer	Understand	4
5	**What** is the difference between IPV4 and IPV6	knowledge	5
6	**What** are the different types of networking / internetworking devices	knowledge	5
7	**Wha**t are the data units at different layers of the TCP / IP protocol suite	Illustrate	5
8	**What** is difference between ARP and RARP	Illustrate	4
9	**Wha**t is the minimum and maximum length of the header in the TCP segment and IP datagram	Understand	2
10	**What** are major types of networks and explain	Understand	1
UNIT – V			
Application Layer			
1	**Why** is SMTP not used for transferring e-mail messages from the recipient's mail server to the recipient's personal computer	Knowledge	2
2	**Why** do you think DNS uses UDP, instead of TCP, for its query and response messages	Knowledge	3
3	In **what** way is instant messaging a hybrid of client-server and P2P architecture	Knowledge	5
4	**What** is difference between ARP and RARP	Knowledge	5
5	**How** to provide better support for Multimedia	Knowledge	1
6	**List f**ive general functions that application layer protocols specify.	Knowledge	2
7	**Elaborate** on the meaning of the terms server and client in the context of data networks.	K nowledge	3
8	**Compare** and contrast client/server with peer-to-peer data transfer over networks.	Understand	5
9	**Give** the specific purposes of the DNS, HTTP, SMB, and SMTP/POP application layer protocols.	Understand	5

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