~~End Semester~~ Examination

~~November 2018~~ Jan-2019

Max. Marks: 60	Duration: 180 Minutes
Class: T.E .	Semester: V
Course Code: IT52	Branch: IT **Make-up Exam**
Name of the Course: Computer Networks	

Instructions:
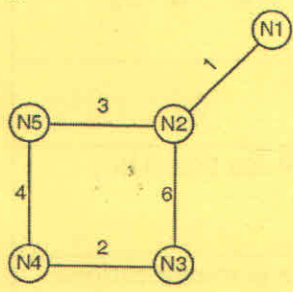- (1) All Questions are Compulsory
- (2) Draw neat diagrams
- (3) Assume suitable data if necessary

Question No.		Max. Marks	CO
Q 1 (a)	What are the key benefits of layered network architecture? (Any 3)	3 + 2 + 3	1
	What do you mean by Service Access Point?		
	What do you mean by Protocol? What it determines? What are its key elements?		
Q 1 (b)	Why does single-mode fiber are used for large distance communications rather than multi-mode fiber? What is maximum length of cable in each of above mode? What devices are used as source and detector in case of single mode of fiber?	2 + 1 + 1	2
Q2(a)	Host A is sending data to host B over a full duplex link. A and B are using the sliding window protocol for flow control. The send and receive window sizes are 5 packets each. Data packets (sent only from A to B) are all 1000 bytes long and the transmission time for such a packet is 50 μs. Acknowledgement packets (sent only from B to A) are very small and require negligible transmission time. The propagation delay over the link is 200 us. What is the maximum achievable throughput in this communication?	2	4
Q2(b)	A network with CSMA/CD protocol in the MAC layer is running at 1 Gbps over a 1 km cable with no repeaters. The signal speed in the cable is 2×10^8 m/sec. The minimum frame size for this network should be?	2	4
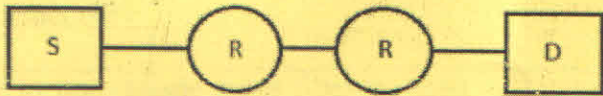
| Q2(c) | a. | The message to be transmitted is 01011011 and uses $x^3 + x + 1$ as the generator polynomial to generate the check bits. What message will be transmitted to receiver? | 2 + 6 | 4 |
| | b. | Draw and explain Ethernet frame format. What should be the minimum pay load length and why? | | |

	OR		
	a. A bit-stuffing based framing protocol uses an 8-bit delimiter pattern of 01111110. If the output bit-string after stuffing is 01111100101, then the input bit-string is ---? Justify your answer. b. Explain flag bytes with byte stuffing framing method with neat diagram.		

Q3 (a)	a.		2 +	3

Consider a network with five nodes, N1 to N5, as shown above. The network uses a Distance Vector Routing protocol. Once the routes have stabilized, the distance vectors at different nodes are as following.

N1:(0,1,7,8,4)
N2:(1,0,6,7,3)
N3:(7,6,0,2,6)
N4:(8,7,2,0,4)
N5:(4,3,6,4,0)

The link N1-N2 goes down. N2 will reflect this change immediately in its distance vector as cost, ∞. But before N2 ,N4 sends its update to N3. After the NEXT ROUND of update, what will be cost to N1 in the distance vector of N3?

b. Differentiate between Datagram Packet Switching and Virtual Circuit Packet Switching in tabular form for 3 different points. | | 3 | |

Q3 (b)	a. An IP router with a Maximum Transmission Unit (MTU) of 1500 bytes has received an IP packet of size 4404 bytes with an IP header of length 20 bytes. Calculate
	    1.Number of fragments required?
	    2.The offset value for each fragment, the MF bit value for each fragment ?
	
	b.An IPV4 packet has arrived with the first 8 bits as 01000010.The receiver discards the packet why?
		5 +
		
		2
			3

	OR		
	a. A company has a class C network address of 204.204.204.0. It wishes to have three subnets, one with 100 hosts and two with 50 hosts each. Derive subnet mask, subnet address along with neat diagram. b. Assume that source S and destination D are connected through two intermediate routers labeled R. Determine how many times each packet has to visit the network layer and the data link layer during a transmission from S to D.	5 + 2	3
Q4 (a)	a. State correct order in which a server process must invoke the function calls accept, bind, listen, and recv according to UNIX socket API? b. Consider an instance of TCP's Additive Increase Multiplicative Decrease (AIMD) algorithm where the window size at the start of the slow start phase is 2 MSS and the threshold at the start of the first transmission is 8 MSS (slow start threshold). Assume that a timeout occurs during the fifth transmission. Find the congestion window size at the end of the tenth transmission with neat diagram.	2 + 6	4
Q4 (b)	The Data Link Layer is reliable and provide flow control and error control. Do we need the flow control and error control at Transport layer too? Justify your answer.	4	4
Q5(a)	Compare TCP and UDP for 4different points.	4	4
Q5 (b)	SPIT student from his Dahanu residence want to connect to application server at a remote site for doing his project and create results that can be transferred to his local site. Which application layer protocol he will use and why? Justify your answer.	4	4
Q5 (c)	How heterogeneity problem is resolved in FTP? File transfer in FTP means which three things?	4	4