



Final Assessment Test – July 2023

Course: BITE305L - Computer Networks

Class NBR(s): 0177 / 0181 / 0191 / 0196 / 0200

Time: Three Hours

Slot: C1+TC1

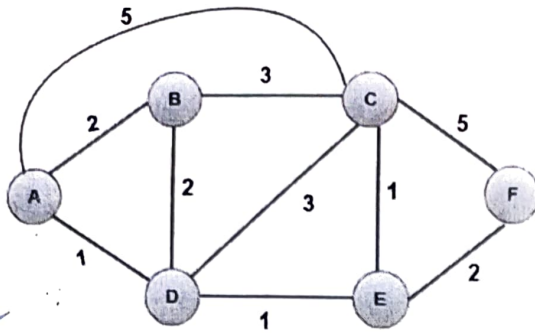
Max. Marks: 100

KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE

Answer ALL Questions

(10 X 10 = 100 Marks)

1. Consider two devices which want to communicate with each other. Analyse how TCP/IP model will be used in those two devices with neat sketch. Emphasize the functionalities of each layer and also present the names of encapsulated packets at each layer.
2. Enumerate the usage of circuit switching network to connect eight telephones in a small area with a diagram. In addition, analyse the delay and efficiency in circuit switching network.
3. Apply CRC technique to detect error while transmitting the following message bits 11001010. Consider the CRC generator as 1010 which is known to both transmitter and receiver. If the MSB of code word is received in corrupted manner, then illustrate how the error is detected.
4. Consider sliding window with $m=2$ and demonstrate how Go-Back N protocol will work for the below scenario with a neat time-sequence diagram: Except first packet, all other packets in transmitter window reached the receiver; Acknowledgement for zeroth packet got lost. All other packets and acknowledgements transmitted successfully. Assume there is no loss of packets or acknowledgments during retransmission.
5. An organization is granted with Class A internet protocol and the starting IP address is 101.0.0.0. But the organization wants to divide this network into four equal sub-networks. For each sub-network, tabulate the starting address, ending address, sub-net mask, sub-net number, broadcast address and number of addresses.
6. Apply the Link State Routing for the below network by considering node 'A' as the root node. Clearly illustrate how Dijkstra's Algorithm is used for LSR. Evaluate the shortest path tree for node 'A' and its route table.



7. An IPv4 datagram has arrived as shown below:

4	5	0	28	
1			0	0
4	17		35761	
10.12.14.5				
12.6.7.9				

Answer the following questions based on the received header by drawing the IPv4 header format.

- i) Are there any options? If yes, give the size of options
 - ii) Is the packet fragmented? Justify your answer.
 - iii) What is the size of the data?
 - iv) How many more routers can the packet travel to?
 - v) What is the identification number of the packet?
8. Consider two devices which want to perform process-to-process communication without establishing a connection. Examine the header format for this type of service and also state its advantages and disadvantages.
9. Analyse and compare how congestion window size is updated after each RTT in slow start using exponential increase approach and congestion avoidance using additive increase approach with neat sketches.
10. Consider a web server like Google and multiple clients which use HTTP for communication. Analyse the differences between persistent and non-persistent connections with neat diagrams. In addition, present the message format for request from client and response from server.

