

MASTER OF ELECTRONICS & TELECOMMUNICATION ENGINEERING
EXAMINATION – 2017

(M.ETCE 1st Year 1st Semester)

COMPUTER COMMUNICATION NETWORK

Full marks: 100

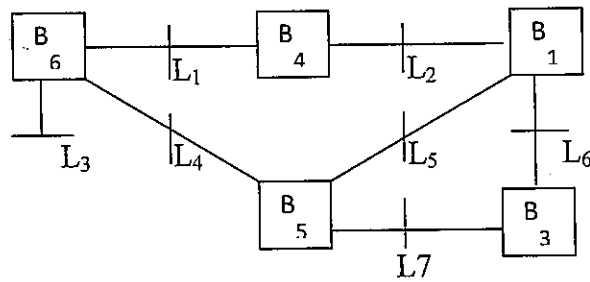
Time: Three Hours

The figures in the margin indicate full marks.

Answer any *five* questions taking at least *two* from each group.

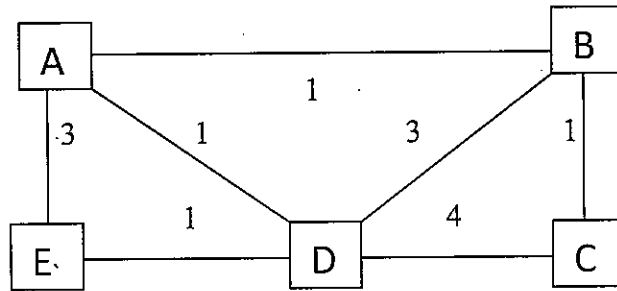
GROUP – A

1. a) A large population of ALOHA users manages to generate 100 requests per second, including both originals and retransmissions. Time is slotted in units of 20 msec. i) What is the chance of success in first attempt? ii) What is the probability of exactly $k=2$ collisions and then a success? What is the expected number of transmissions needed? 10
b) In a CSMA network, if a packet consists of 1000 bytes, transmission rate is 10 Mbps, propagation delay is double the transmission line, find the length of the network. Deduce the formula you use. 10
2. a) What do you mean by Head of Line Blocking in an input queue switch? Show the Markov Chain representation of a 2x2 input queued switch. Hence find the saturation throughput of the switch. 10
b) Give a schematic of 8 to 4 knockout switch and explain its operation. How do you realize the output buffer mechanism? 10
3. a) Describe with a frame format how virtual tributaries are multiplexed in a SONET STS-1 frame. Which sub-layer is responsible for many SONET streams to be multiplexed on to a higher speed stream of SONET? When SONET path fails, which sub-layer switches the traffic over another path? 10
b) Explain the algorithm of Cyclic Redundancy Check (CRC) considering original message $M(x)$ and CRC. 10
4. a) Explain with the Finite State Machine model, verification mechanism of a Protocol for unidirectional data flow over an unreliable channel. 10
b) Describe the Spanning Tree algorithm. Find the Spanning Tree generated for the extended LAN. 10



GROUP - B

5. a) Describe and explain Dijkstra's algorithm in Graph Theoretic terms. With respect to the following diagram, find the distance vector table of node E. 10



- b) What is Link State routing protocol? What is the procedure of formation of Link State Routing table? With respect to the diagram above (prob. 5a) Show how the Link State routing table of node A is formed. 10
6. a) What are the features of OSPF and how is its header format. What do you mean by OSPF Link State advertisement? 10
 (b) With the help of Finite State Machine model describe the TCP connection management. 10
7. a) Why an end to end flow control technique is required at transport layer and how is it implemented? What is the header format of TCP? 10
 b) Why do you need TCP congestion control though there exists congestion control at network layer? Describe the principle of Slow Start algorithm. 10
8. Write short notes on any *two* of the following: 10x2
- a) Domain Name Service
 - b) Firewall and Proxy service
 - c) RSA algorithm
 - d) M/M/R queue and its application in data communication