

MCA (Revised)  
Term-End Examination  
December, 2018

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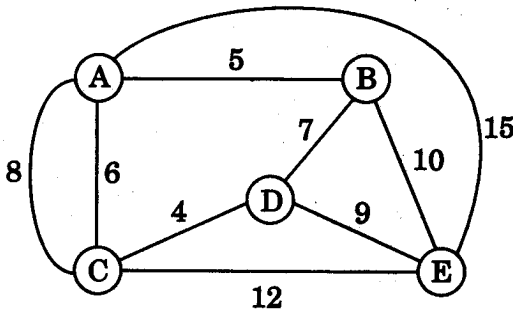
MCS-042 : DATA COMMUNICATION AND  
COMPUTER NETWORKS

Time : 3 hours

Maximum Marks : 100

Note : Question no. 1 is compulsory. Attempt any three questions from the rest.

1. (a) State Nagle's algorithm and explain how does it reduce the wastage of bandwidth. 5
- (b) Consider the following network. Apply Dijkstra's algorithm to compute the shortest path from A to all the network nodes. Show all the intermediate calculations. What are the drawbacks of this algorithm? 10



- (c) Draw NRZ-I and Manchester encoding for 0100110 bit stream. 5
- (d) Obtain expression for throughput in ALOHA and Slotted ALOHA. How does the Slotted ALOHA improve the performance over Pure ALOHA ? 10
- (e) Differentiate between Leaky bucket and Token bucket. 5
- (f) Find the CRC for data polynomial  $x^4 + x^2 + x + 1$  where generator polynomial is  $x^3 + 1$ . 5
2. (a) Explain DES algorithm with an example. 10
- (b) Differentiate between synchronous, asynchronous and isochronous transmission. 6
- (c) What is the reason for a minimum frame length in IEEE 802.11 ? 4
3. (a) Explain the purpose of the following fields of the TCP header format : 10
- (i) Urgent pointer
  - (ii) Syn
  - (iii) Window
  - (iv) RST

- (b) Explain the concept of Sliding Window protocol with the help of a diagram. Also explain how does Sliding Window protocol Go-Back-N increase the utilization of bandwidth compared to Stop and Wait protocol. 5
- (c) Differentiate between Symmetric key cryptography and Asymmetric key cryptography. 5
4. (a) Explain hidden station and exposed station problems in wireless LAN protocols with the help of examples. 5
- (b) Why is packet fragmentation needed in IP? 5
- (c) Discuss ethernet frame format (802.3). 10
5. (a) Explain Diffie-Hellman algorithm with the help of an example. 10
- (b) Discuss the features of Twisted pair cable, Baseband co-axial cable, Broadband co-axial cable and Optical fiber. 10
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