

B.E./B.TECH. Degree Examination, December 2020

Fifth Semester

IT18501 -DATA COMMUNICATION AND NETWORKING

(Regulation 2018)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions**PART A - (8 X 2 = 16 marks)**

1. _____ cables can carry signals of higher frequency ranges than _____ cable.
 - (a) Twisted-Pair; Fiber-optic
 - (b) Coaxial; Twisted-Pair
 - (c) Coaxial; Fiber-optic
 - (d) None of the above.
2. In IEEE 802.11 frames, when the value of, To DS and From DS are 00, its mean the frame is not going to a
 - (a) Adhoc System
 - (b) Infrastructure System
 - (c) Distributed System
 - (d) Cellular System
3. Emulation of _____ through _____ is not efficient and may create long delays.
 - (a) unicasting; multiple unicasting
 - (b) multicasting; multiple unicasting
 - (c) broadcasting; multicasting
 - (d) none of the above
4. What is User Agents in SMTP?
 - (a) It acts as a Mail Box
 - (b) It transfers the mail
 - (c) It prepares the message, encloses it in an envelope internet
 - (d) It sends and receives the message
5. What are the key benefits of layered network?
6. Give a scenario in which the hidden node problem is highly vulnerable.
7. What is the purpose of the sequence number in a TCP Packet?
8. What is the relationship between a domain name and an IP subnet number?

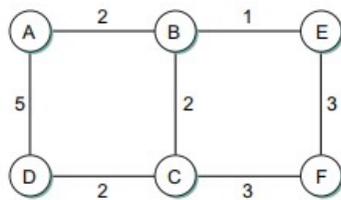
PART B - (4 X16 = 64 marks)

09. (a) (i) Illustrate different network topology in detail with their performance (8) indicator. Also draw and show the hybrid topology with star as backbone and four ring networks.
- (ii) Consider a 5 device network. If you connect 2 new devices additionally, how (8) many new cables are needed? Illustrate the scenario with neat diagram. Justify which topology is best.
 - (1) Mesh
 - (2) Ring
 - (3) Star

(OR)

- (b) (i) Suppose we want to transmit the message 11001001 and protect it from errors (8) using the CRC polynomial x^3+1 . Use polynomial long division to determine the message that should be transmitted.

- (ii) Suppose the leftmost bit of the message is inverted in the above transmitted (8) message due to noise on the transmission link. What is the result of the receiver's CRC calculation? How does the receiver know that an error has occurred?
10. (a) Compare and contrast between wired and wireless network Collision Detection and (16) Collision Avoidance techniques.
- (OR)**
- (b) Illustrate how to implement reliable transformation in Data Link Layer with help of (16) sliding window protocol. Compare and contrast between DHCP and ARP in details with their application.
11. (a) Consider the network shown below. Show the operation of Dijkstra's (link-state) (16) algorithm for computing the least cost path from B to all destinations. what is the cost of this path? Explain link-state algorithm.



(Figure 1)

(OR)

- (b) For the above network (Figure 1) find the initial and final Distances vector table (16) stored at each node (Global View). Explain Routing Information Protocol with packet format.
12. (a) (i) Compare and contrast additive increase/multiplicative decrease TCP (8) congestion control algorithm with slow start TCP congestion control.
- (ii) Compare and contrast IPv4 and IPv6. Enumerate on the various reasons that (8) are present behind the transition from IPv4 to IPv6.
- (OR)**
- (b) (i) Describe with an example how does HTTP request retrieves the document (8) `usr/users/doc/doc1`. Show the response for
- (1) If the document is moved to `usr/deads/doc1`.
 - (2) If there is syntax error in the request.
- (ii) Illustrate how Domain Name System translates name to IP address with neat (8) diagram.