Course Code : CST 317 / CST 305 **ITSJ/RW – 17 / 1057**

Fifth Semester B. E. (Computer Science and Engineering) Examination

COMPUTER NETWORKS

Time : 3 Hours] [Max. Marks : 60

Instructions to Candidates :—

(1) All questions carry marks as indicated.

(2) Assume suitable data and illustrate answers with neat sketches wherever necessary.

1. (a) Define the purpose of service primitives. Differentiate between connection oriented and connectionless scenario. 5 (CO 1)

   (b) How computer networks can be classified on the basis of inter processor distance between two nodes ? Provide the proper description of each case with proper examples. 5 (CO 1)

2. Solve any **Two** :—

   (a) Discuss different propagation modes in unguided signals. 5 (CO 2)

   (b) What are the advantages and disadvantages of using a fiber optic cable ? How many modes it uses ? Explain in detail. 5 (CO 2)

   (c) What are infrared signals ? How does unidirectional antenna works ? Radio Antenna often works best when the diameter of the antenna is equal to the wavelength of the radio wave. Reasonable antennas range from 1 cm to 5 meters in diameter. What frequency range does this cover ? 5 (CO 2)

3. Solve any **Two** :—

   (a) Analyze the response of the receiver when there is error in pipelining. What are the ways to solve the problem of errors in pipelining ? 5 (CO 3)

   (b) Weigh the pros and cons of error correction and error detection. If 1110010100111 is data and 1011 is generator polynomial then calculate the frame needs to be sent. 5 (CO 3)

(c) What will happen if framing mechanism is not provided ? Discuss all framing mechanisms. 5 (CO 3)

4. Solve any **Two** :—

(a) How many persistence strategies do CSMA adopts ? Explain them. Elaborate the working of CSMA / CD and CSMA CA. 5 (CO 3)

(b) Four channels, two with a bit rate of 300 Kbps and two with a bit rate of 150 Kbps, are to be multiplexed using multiple slot TDM with no synchronization bits. Answer the following questions :—

(1) What is the size of the frame in bits ?

(2) What is the frame rate ?

(3) What is the duration of the frame ?

(4) What is the data rate ?

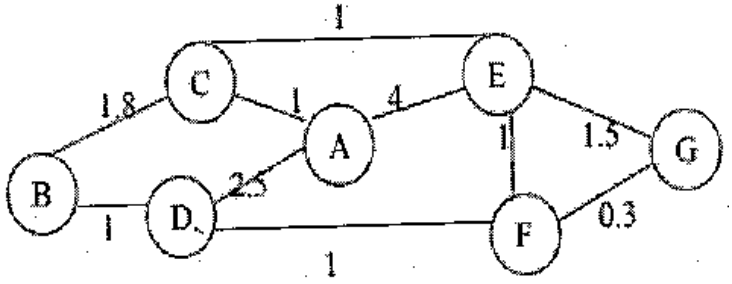
Draw the above configuration. 5 (CO 3)

(c) Describe the process for election of a monitor in an IEEE 802.5 token ring LAN ? Elaborate the responsibilities of a monitor. 5 (CO 3)

5. (a) Why traffic policing is needed ? Discuss the token bucket algorithm in detail. Compare the token bucket algorithm with leaky bucket algorithm. 5 (CO 3)

(b) Solve any **One** :—

(i) Use Dijkstra's shortest paths algorithm to determine the shortest paths to node A from all remaining nodes. Record the order in which the nodes are made permanent along with the next hop and the distance to the destination.



5 (CO 4)

(ii) What is the need of hierarchical routing ? List its advantages. For hierarchical routing with 5600 routers, what region and cluster size should be chosen to minimize the size of the routing table for a three layer hierarchy ? 5 (CO 3)

6. (a) Solve any **One** :—

(i) Let the size of congestion window of a TCP connection be 32 kb when a timeout occurs. The round trip time of the connection is 100 milliseconds and maximum segment size used is 2 kb. Calculate the time taken (in milliseconds) by the TCP connection to get back to 32 kb congestion window. 5 (CO 4)

(ii) Suppose a TCP congestion window is set to 18 K bytes and a timeout occurs. How big the window is if the next four transmissions bursts are all successful ? Assume that the maximum segment size is 1 KB. Also state the working of Internet Congestion control Algorithm. 5 (CO 4)

(b) How TCP does manage flow control and buffering ? 5 (CO 3)