

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI-15

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

V SEMESTER B.TECH, CYCLE TEST 2

CSPC53 COMPUTER NETWORKS

DATE: 14/10/2024

Answer All Questions

MAX. MARKS: 20

1. Consider an error free 64 Kbps satellite channel for sending 512 byte data frames in one direction with very short acknowledgments coming back the other way. What is the maximum throughput for window sizes of 1, 7, 15 and 127? (3)
2. Frames of 1000 bits are sent over a  $10^6$  bps link between 2 hosts. The propagation time is 25ms. Frames are to be transmitted into this link to maximally pack them in transit (within the link). Suppose that the sliding window protocol is used with the sender window size of  $2^l$  where  $l$  is the minimum number of bits in the sequence number and acknowledgments are always piggybacked. After sending  $2^l$  frames, what is the minimum time the sender will have to wait before starting transmission of the next frame? (Identify the closest choice ignoring the frame processing time.) (4)
3. Draw a banyan switch to handle 8 inputs and 8 outputs. In that diagram, highlight how the Input 5 is connected with Output 4. (3)
4. For hierarchical routing with 4800 routers, find the following: (2+1)
  - a. what region and cluster size should be chosen to minimize the size of the routing table for a 3-level hierarchy?
  - b. Number of row/entries in the routing table
5. Let the size of congestion window of a TCP connection be 32KB when a timeout occurs. The RTT of the connection is 100msec and the MSS used is 2 KB. What is the time taken (in msec) by the TCP connection to get back to 32KB congestion window? (4)
6. Even though UDP headers have a 16-bit field to specify the datagram's size, why can't UDP datagrams be as large as 65536 bytes? (3)