

JAYPEE UNIVERSITY OF INFORMATRION TECHNOLOGY, WAKNAGHAT  
 Make Up EXAMINATION- 2018  
 B.Tech VI Semester

COURSE CODE: 10B11CI611

MAX. MARKS: 25

COURSE NAME: Computer Networks

COURSE CREDITS: 04

MAX. TIME: 1.5 HR

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Each Question carries 5 Marks.

1. Answer the following questions:

- If the unit exchanged at the data link level is called a frame and the unit exchanged at the network level is called a packet, do frames encapsulate packets or do packets encapsulate frames? Explain your answer.
- Why does impulse noise have more effect on digital signals rather than on analog signals?
- Explain why collision is an issue in a random access protocol but not in controlled access

2. We need a three-stage space-division switch with  $N = 100$ . We use 10 crossbars at the first and third stages and 6 crossbars at the middle stage.

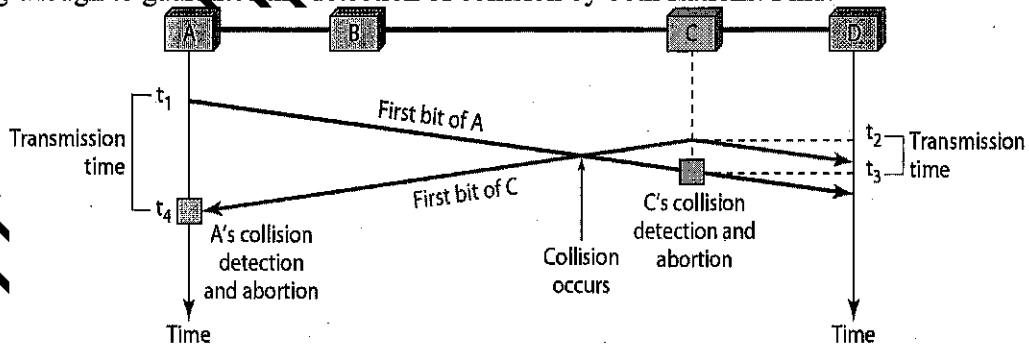
- Draw the configuration diagram.
- Calculate the total number of cross points.
- Find the possible number of simultaneous connections.
- Find the possible number of simultaneous connections if we use one single crossbar

( $100 \times 100$ ).

e. Find the blocking factor, the ratio of the number of connections in part c.

3. The timer of a system using the Stop-and-Wait ARQ Protocol has a time-out of 6 ms. Draw the flow diagram for Stop-and-Wait ARQ protocol for four frames if the round trip delay is 4 ms. Assume no data frame or control frame is lost or damaged.

4. In the following Figure, the data rate is 10 Mbps, the distance between station A and C is 2000 m, and the propagation speed is  $2 \times 10^8$  m/s. Station A starts sending a long frame at time  $t_1 = 0$ ; station C starts sending a long frame at time  $t_2 = 3 \mu s$ . The size of the frame is long enough to guarantee the detection of collision by both stations. Find:



- The time when station C hears the collision ( $t_3$ )
  - The time when station A hears the collision ( $t_4$ )
  - The number of bits station A has sent before detecting the collision.
  - The number of bits station C has sent before detecting the collision.
5. A sender needs to send the four data items 0x3456, 0xABCC, 0x02BC, and 0xEEEE. Answer the following:
- Find the checksum at the sender site.
  - Find the checksum at the receiver site if there is no error.
  - Find the checksum at the receiver site if the second data item is changed to 0xABCE.