Reg. No.					

MANIPAL INSTITUTE OF TECHNOLOGY Manipal University



FIFTH SEMESTER B.TECH (E & C) DEGREE END SEMESTER EXAMINATION - NOV/DEC 2016 SUBJECT: COMMUNICATION NETWORKS (ECE - 309)

TIME: 3 HOURS

Instructions to candidates

MAX. MARKS: 50

• Answer **ANY FIVE** full questions.

- Missing data may be suitably assumed.
- 1A. What are the various network topologies? Explain each along with advantages and disadvantages.
- 1B. Mention the functions of any three LAN interconnecting devices.
- 1C. A digital signalling system is required to operate at 9600 bps. If a signal element encodes a 4-bit word, what is the minimum required bandwidth of the channel?

(5+3+2)

- 2A. For message M=1010001101 and generator polynomial =110101 Find the code word. If the same code word is received at the receiver, show that there are no errors in the code word.
- 2B. The distance from earth to a distant planet is 9×10^{10} m. What is the channel utilization if a stopand-wait protocol is used for frame transmission on a 64 Mbps point-to-point link? Assume that the frame size is 32 KB and the speed of light is 3×10^8 m/s.
- 2C. A network using CSMA/CD has a bandwidth of 10 Mbps. If the maximum propagation time (including the delays in the devices and ignoring the time needed to send a jamming signal) is $25.6 \,\mu$ s, what is the minimum size of the frame?

(5+3+2)

- 3A. i) Encode 4F H using Bipolar, NRZ-I, Manchester and Differential Manchester techniques.
 - ii) At DLL, form a frame using byte-stuffing algorithm for the following text:
 - a) CLASS COMMITTEE MEETING Given $E \rightarrow ESC$ Character, $T \rightarrow Flag$ bytes
 - b) EVERY ONE HAS SELF ESTEEM Given $S \rightarrow ESC$ Character, $E \rightarrow Flag$ bytes
- 3B. Give the steps in 3-way and 4-way handshaking algorithms with suitable examples.
- 3C. A group of *N* stations shares a *56-kbps* pure ALOHA channel. Each station outputs a *1000-bit* frame on an average of once every *100 sec*, even if the previous one has not yet been sent (e.g., the stations can buffer outgoing frames). What is the maximum value of *N*?

(5+3+2)

4A. Form the complete routing table at node 'B' using distance vector routing for the following network.



- 4B. Let a MU network having a capacity of 1Mb of data is arriving at the rate of 25 Mbps for 40msec. The token arrival rate is 2 Mbps and the capacity of bucket is 500kb with maximum output rate 25 Mbps. Find i) The burst length ii) Total output time.
- 4C. In IEEE 802.5 network has 80 computers and distance between them is 100 meters. The data rate is 16 Mbps, and the delay that each station interface introduces between when the interface receives a frame and forwards it along the output line is 2.5 Bits. What is ring latency in terms of bits?

(5+3+2)

- 5A. Draw and explain the IEEE 802.5 frame format.
- 5B. What is Silly window syndrome? Give the solution to resolve the syndrome if it created at i) Sender ii) Receiver.
- 5C. A classful address in a block is given as 73.22.17.25. Find the number of addresses in the block, the first address, and the last address.

(5+3+2)

- 6A. Explain the mail transfer phases and mail delivery phases using SMTP with neat sketches.
- 6B. Explain the functioning of FTP for server-Client model.
- 6C. Explain the types of documents in HTTP.

(5+3+2)