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**Second Semester M.Tech. Degree Examination, Dec.08/Jan.09**  
**Computer Networks**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions**

- 1
  - a. What are the basic types of network applications? Compare the performance requirement in each case. (05 Marks)
  - b. Briefly discuss the concept of network layers. What are the two models used for the implementation of the protocols in the various layers? Explain. (05 Marks)
  - c. Derive an expression for the utilization factor for stop-and-wait protocol and hence show under what conditions this protocol becomes inefficient. (10 Marks)
- 2
  - a. What is encoding? Show the encoding of the data 1100110 using NRZ and Manchester coding. Compare the merits and demerits of each. (08 Marks)
  - b. What are the requirements in the selection of generator polynomial in CRC, so that it can detect 1 bit, 2 bits, odd number of bits and burst errors. (06 Marks)
  - c. Write short note on exponential back off algorithm used in Ethernet. (06 Marks)
- 3
  - a. How the following features are implemented in a token ring LAN?
    - i) Priority
    - ii) Detection of dead station
    - iii) Removal of orphan frames.
    - iv) Token maintainance (08 Marks)
  - b. An IEEE 802.5 token ring has five stations and a total wire length of 230 m. How many bits of delay must the monitor insert into the ring? Do this for 16 Mbps line and use propagation rate of  $2.3 \times 10^8$  m/sec. (06 Marks)
  - c. Explain CSMA/CA access mechanism in IEEE 802.11. How does this method solve hidden and exposed nodes problems? (06 Marks)
- 4
  - a. Compare the features of data gram, virtual circuit and source routing algorithms. (06 Marks)
  - b. With the help of an example, show how the VCI table is prepared using switched virtual circuit (SVC). (06 Marks)
  - c. Explain the spanning tree algorithm in extended LAN and show how this algorithm is implemented. (08 Marks)
- 5
  - a. Discuss the IP address format and show how this address format is used in forwarding data gram. (06 Marks)
  - b. Consider sending a 2000 byte data gram into a link that has MTU (Maximum Transmission Unit) of 500 bytes. Suppose the original data gram is stamped with an identification number 422. How many fragments are generated? Show the relevant field entries in each data gram fragments. (08 Marks)
  - c. With the help of a suitable example explain the 'count-to-infinity' problem in distance vector routing algorithm. Give any one method to eliminate this problem. (06 Marks)
- 6
  - a. Compare the features of WDP and TCP. (04 Marks)
  - b. Show the structure of the TCP segment header and identify the functions of each field in it. (10 Marks)
  - c. TCP implement the sliding window protocol not at the point-to-point level, but at end-to-end level. What are the differences between the two? (06 Marks)
- 7
  - a. What do you understand by the terms effectiveness and fairness with respect to resource allocation? Discuss the basic principle of fair queuing. (08 Marks)
  - b. What is meant by adaptive re-transmission? Explain any one method. (06 Marks)
  - c. Discuss any window based congestion control algorithm used in TCP. (06 Marks)
- 8
  - a. With the help of a suitable example, discuss the functioning of Domain Name Server (DNS). (10 Marks)
  - b. Write short notes on any two:
    - i) Real time transport protocol.
    - ii) SNMP.
    - iii) Overlay networks. (10 Marks)