Total No. of Questions : 10] [Total No. of Printed Pages : 4

MCA–305(N)

M. C. A. (Third Semester)
EXAMINATION, Nov.-Dec., 2007
(New Course)
COMPUTER NETWORKS
[MCA–305(N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : There are five Units. Attempt any *one* question from each Unit.

Unit–I

1. (a) Discuss and compare protocols and services in the context on layered network architecture. 10

   (b) Differentiate between the following : 5 each

   (i) Broad band ISDN and narrow band ISDN

   (ii) Differential PCM and normal PCM

Or

2. (a) What is non-persistent CSMA/CD ? Consider building a CSMA/CD network running at 1 Gbps over a 1 km cable with no repeaters. The signal speed in the cable is 200000 km/sec. What is minimum frame size ? 10

   (b) Consider the delay of pure ALOHA *vs* slotted ALOHA at low load. Which one is less ? Explain your answer. 10

Unit–II

3. (a) Assuming a send window of K, deduce the minimum range of sequence nos. (frame identifiers) required with each of the following error control schemes : 10

   (i) Selective repeat

   (ii) Goback-n

   (b) In system 16 binary messages 0000 through 1111 are to be transmitted over a data link. Each message is to be protected by a 3-bit CRC generated using the polynomial $x^3 + x^2 + 1$: 10

   (i) Derive 3 check bits for each of the three messages :

   (1) 0000

   (2) 0001

   (3) 0010

   (ii) Show a single bit error and a double bit error in a transmitted code word are detected at the receiver assuming the transmitted message is 1111.

Or

4. (a) Explain the principle of operation of a CRC error detection scheme. If the given message is '10100101' and predefined pattern is '110101', then : 10

   (i) generate the transmitted message at the transmitter.

   (ii) the received message is checked for correctness at the receiver.

   (b) Consider an error free 64 kbps satellite channel used to send 512 byte data frames in one direction with very

short acknowledgement coming back the open way. What is the maximum throughput for window sizes of 1, 7, 15 and 127 ? 10

Unit – III

5. (a) Describe the frame format of IEEE 802·4 standards. 10

   (b) Derive an expression for the utilization and worst case access delay of FDDI ring network in terms of the ring latency and target token rotation timer setting. 10

Or

6. (a) Differentiate between 802·3, 802·4 and 802·5. 10

   (b) A bridge between 802·3 LAN and 802·4 LAN has a problem with intermittent memory errors. Can this problem cause undetected errors with transmitted frames or will all these be caught by frame checksum ? 10

Unit – IV

7. (a) Describe distance vector routing algorithm. What is count to infinity problem ? 10

   (b) Compare the following : 10

   (i) Virtual circuit and Datagram service
   (ii) Open loop and Closed loop congestion control
   (iii) Static and Dynamic routing

Or

8. (a) Explain leaky bucket algorithm in congestion control. 10

   (b) With a neat diagram explain Bellman-Ford routing algorithm for routing packets. 10

Unit – V

9. (a) Explain DNS. How many levels can a DNS have ? Also explain domain, label and full qualified domain name. 10

   (b) Explain the concept of SNMP. 10

Or

10. (a) Explain the Architecture of www. Also define client, server, URL, cookies. 10

    (b) Explain cryptography. What are its various components ? 10