8. Write short notes on any four : 4×5=20

a) Connectionless and connection oriented services.

b) Internal design of a Virtual Circuit (V.C.) subnet.

c) Flooding as a routing technique.

d) Link state routing technique.

e) Symmetric key and public-key encryption.

f) Message integrity and message digest.

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BACHELOR OF COMPUTER Sc. ENGG. EXAMINATION 2009

(3rd Year, 2nd Semester)

COMPUTER NETWORKS

Time : Three hours Full Marks : 100

Answer any ***five*** questions

1. a) Explain the difference between data communication and computer networking. 3

b) What is a computer network? Discuss how a computer network can be built as a 1-level (i.e. flat),2-level or 3-level hiearchical structure and discuss their relative advantages and disadvantages. 12

c) Explain what is meant by the layered architecture of a computer network. 5

2. Why is resource sharing an extremely important concept in computer networking? Discuss how a communication link, as a resource, is shared among multiple computers using various multiplexing techniques that you know of. 20

3. a) Discuss the various switching techniques used for transporting user massages over a communication subnet. 10

b) Compare the relative advantages and disadvantages between the above switching techniques. 10

4. a) Explain what is meant by data communication being asynchronous, synchronous and intermittently synchronous and point out thjeir relative advantages and disadvantages. 9

b) Explain which of the above modes is used in the ethernet and in the token ring LAN ? 5

c) How does a receiver provide the acknowledgement for a received frame in the ethernet and in the token ring LAN ? 6

5. a) Describe the structure and principal of operation of a DQDB MAN. 11

b) Explain the data encoding scheme employed in FDDI and discuss why this scheme was needed. 9

6. a) Discuss the relative advantages and disadvantages of wired and wireless networking. 6

b) Consider a slotted ALOHA network with a large number of users, where the slot size is 10 msec and the frame size is 50,000 bytes. Estimate the maximum possible throughput of the network in bits/sec. 5

c) Assume that the above slotted ALOHA network is used by only 3 users A, B and C who randomly send on the average, sixty forty and tweenty thousand frames per hour respectively. Determine the probability of success in the first attempt and also in the second attempt for each user. 9

7. a) Assume that, for an JEEE 802.11 LAN, the RTS, CTS and ACK frames each has a duration of 1 msec. Consider that a station C, just before sending a RTS (D, C, 2 sec) frame to D, hears

(i) a RTS (B, A, 1 sec)

(i) a CTS (B, A, 1 sec)

Clearly explain when C can send its own RTS frame in each of the above two cases.

b) Explain the terms space division multiplexing (SDM), frequency rense and handover (or handoff) in the context of a wireless cellular network. 6

c) What is the multiplexing hierarchy used in a GSM cellular network and in a CDMA cellular network ? 6