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प्रज्ञानं ब्रह्म

Manipal

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V SEMESTER B.TECH. (COMPUTER SCIENCE AND ENGINEERING) DEGREE END-SEMESTER EXAMINATION-NOVEMBER/DECEMBER 2014
SUBJECT: COMPUTER COMMUNICATION AND NETWORKS (CSE 311)
DATE: 09-12-2014

TIME: 3 HOURS MAX.MARKS: 50

Instructions to Candidates

- Answer **any five** full questions.

1.A. What are the two reasons for using layered protocols? What is the one possible disadvantage of using layered protocols?

1.B. What do you mean by interlacing? Explain in detail with the required diagram and example.

1.C. Distinguish between attenuation distortion and delay distortion. How the effect of delay distortion can be minimized? (3+4+3)

2.A. The digital signal is to be designed to permit 160 kbps for a bandwidth of 20 KHz. Determine (a) number of levels and (b) S/N ratio

2.B. For the bit stream 01100000000100001100, sketch the waveforms for:
a) B8ZS b) HDB3

2.C. With a neat diagram explain graded-index multimode optical fiber. Is it the most suitable among all the types of optical fiber for large distance communications? Justify your answer. (2+3+5)

3.A. Given the data stream 1011000111. Draw the in-phase and the quadrature phase (in details) using QPSK.

3.B. Explain asynchronous transmission. Show the effect of timing error in the same.

3.C. Consider a frame consisting of two characters of four bits each. Assume that the probability of bit error is 10^{-3} and that it is independent for each bit.
a. What is the probability that the received frame contains at least one error?
b. Now add a parity bit to each character. What is the probability? (4+3+3)

4.A. Write an expression with a neat timing diagram for the line utilization for a sliding window protocol, assuming a window size of N.

4.B. Mention any four differences between Go-back-N ARQ and selective reject ARQ.

4.C. Four channels are multiplexed using TDM. If each channel sends 100 bytes/s and we multiplex 1 byte per channel, show the frame traveling on the link, the size of the frame, the duration of a frame, the frame rate, and the bit rate for the link. (3+4+3)

5.A. Measurement of a slotted ALOHA channel with an infinite number of users shown that 10 percent of the slots are idle.
(a) What is the channel load, G?
(b) What is the throughput?
(c) Is the channel under loaded or over loaded?

5.B. Explain the binary exponential backoff algorithm used in IEEE 802.3 for LANs.

5.C. Assume stations with addresses 0101, 0110, 1011, 1101 and 1110 are all trying to access the channel. Show how the conflict is resolved using binary countdown collision-free protocol.

(3+3+4)

6.A. Explain in detail any six comparisons between datagram network and virtual circuit network.

6.B. Write the full routing table and hierarchical routing table for the router 1A as shown in the Fig. 6.B. below:

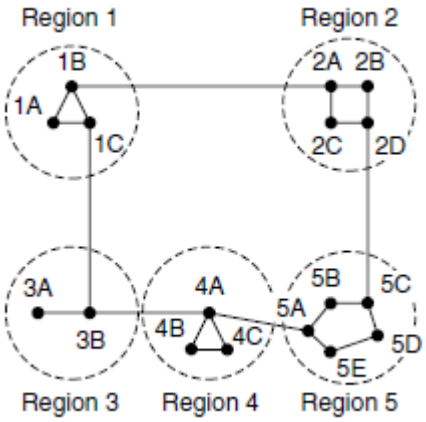

Figure 6.B.

6.C. Explain three methods to avoid duplicate packets generated by flooding algorithm. (3+4+3)

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