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MANIPAL INSTITUTE OF TECHNOLOGY
 (Constituent Institute of Manipal University)
 MANIPAL-576104



FIFTH SEMESTER B.E. (CSE) DEGREE MAKE-UP EXAMINATION
JANUARY 2009
COMPUTER COMMUNICATION AND NETWORKS (CSE 309)
(REVISED CREDIT SYSTEM)
DATE 10-01-2009

TIME: 3 HOURS

MAX.MARKS: 50

Instructions to Candidates

- Answer **any five** full questions.
- Missing data can be suitably assumed.

1A. Draw a neat diagram of ISO-OSI computer network model and briefly explain the function of each layer. --6

1B. Explain why digital transmission is the most preferred means of transmission. --4

2A. Derive an expression for E_b/N_o in terms of the spectral efficiency C/B . --4

2B. Given a channel with an intended capacity of 30 Mbps, the bandwidth of the channel is 3 Mhz. Assuming white thermal noise, what signal to noise ratio is required to achieve this capacity. --3

2C. With neat diagrams explain the different optical fiber transmission modes.

3A. Distinguish between Manchester and different Manchester encoding techniques. What are their merits and demerits. --5

3B. With a neat diagram and relevant equations describe quadrature amplitude modulation. --5

4A. An asynchronous transmission scheme uses 8 data bits, an even parity bit and a stop element of length 2 bits what percentage of clock in accuracy can be tolerated at the receiver with respect to the framing error? Assume that the bit samples are taken at the middle of the clock period. Also assume that at the beginning of the start bit, the clock and incoming bits are in phase. --3

4B. For $P = 110011$ and $M=11100011$ find CRC by using polynomial notation. --4

4C. Explain the problem associated with maximum window size in selective reject ARQ. --3

5A Describe statistical Time Division Multiplexing, with suitable diagrams. --5

5B. A large population of ALOHA users manage to generate 80 requests/sec including both originals and retransmissions Time is slotted in units of 60 msec.

- i. What is the chance of success on the first attempt?
 - ii. What is the probability of exactly k collisions and then a success?
 - iii. What is the expected number of transmission attempts needed?
- 5

6A. Distinguish between datagram and virtual circuit subnets. --3

6B. Explain the count-to-infinity problem encountered in distance vector routing. --3

6C. Explain the choke packet congestion control algorithm. --4

END