

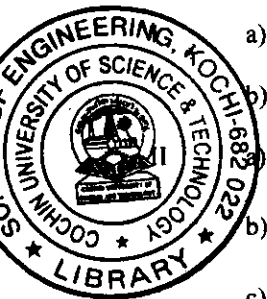
B.Tech. Degree V Semester (Supplementary) Examination, May 2006

CS 504 DATA COMMUNICATION

(2002 Admissions onwards)

Time: 3 Hours

Maximum Marks: 100



- a) What do you mean by frequency modulation (FM)? Derive an expression for the transmitted wave in FM? What is the significance of Bessel function in FM? (12)
- b) Explain any four types of noise that effects communication system. (8)
- OR**
- With neat diagrams explain the modulator-demodulator set up for delta modulation. Also give the drawbacks of delta modulation. (10)
- b) Why $f_s \geq 2f_m$; where f_s - sampling frequency and f_m - maximum frequency content in the message signal? (6)
- c) Draw neat sketches for PAM, PWM and PPM waves. (4)
- III a) Explain different types of transmission media that can be used in communication systems. (10)
- b) With neat block diagrams explain the transmitter and receiver for a QPSK transmission Scheme. (6)
- c) Write the postulates of Shannon's theorem. (4)
- OR**
- IV a) Explain various switching networks in data communications. (10)
- b) Assuming that a PSTN has a bandwidth of 3000 Hz and a typical signal to noise power ratio of 20dB, determine maximum theoretical information (data) rate that can be achieved. (6)
- c) How ASK differs from AM? (4)
- V a) Describe how frame synchronization is achieved with asynchronous and character oriented synchronous transmission. (12)
- b) Explain difference between asynchronous and synchronous transmission control scheme. (8)
- OR**
- VI a) With the aid of diagrams explain how clock synchronization can be achieved using:
(i) Bipolar encoding (ii) Phase (Manchester) encoding (10)
- b) How bit synchronization can be achieved in asynchronous mode of transmission? (5)
- c) What do you meant by character or bit stuffing? (5)
- VII With neat schematics explain different ARQ implementations. (20)
- OR**
- VIII a) Explain what is meant by the term 'Link Management'. With neat sketches show how a logical communication path is established (set up) between two systems and subsequently cleared (disconnected). (10)
- b) A series of 1000 bit frames is to be transmitted across a data link of 100 Km in length at 20Mbps if link has a velocity of propagation of 2×10^8 m/s and bit error rate of 4×10^{-5} . Determine link utilization using the following link protocols:
(i) Idle RQ (ii) Selective repeat and a send window of 10
(iii) Go back - N and send window of 10 (10)
- IX a) Explain the difference between time division multiplexer and a statistical multiplexer with necessary sketches. (10)
- b) With suitable examples, explain different error detection methods (any two). (10)
- OR**
- X a) Distinguish between roll-call polling and hub-polling. With suitable sketches explain its operation. (8)
- b) A series of messages is to be transferred between two computers over the PSTN. The messages comprise the characters A through H with relative frequency of occurrence as follows:
A and B = 0.25; C and D=0.14; E, F, G and H= 0.055
(i) Use Shannon's formula, obtain the minimum average number of bits per character
(ii) Use Huffman coding to obtain a code-word set and construct the corresponding Huffman code tree
(iii) What do you mean by prefix property of Huffman codes? (12)