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B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Fifth Semester

Computer Science and Engineering

EC 351 — ANALOG, DIGITAL AND DATA COMMUNICATIONS

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Frequency modulation and mention its advantages.

2. What is natural sampling?

3. If the probability of three messages A, B, C are 0.45, 0.35 and 0.2 respectively, what is the entropy of the source.

4. Define code efficiency.

5. What are the advantages of digital transmission?

6. For the bit stream, 01001110, sketch the waveforms for NRZ-L and Manchester coding.

7. What are the limitations of NRZ?

8. Define on-off keying.

9. How is parity check used for error detection?

10. What is HDLC?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the principle of amplitude modulation. (8)

   (ii) Draw the circuit of a diode envelope detector and explain how it is used for AM demodulation. (8)

Or

(b) (i) Distinguish between the different pulse modulation schemes with neat diagram. (6)

(ii) Explain quantization and determine the quantization error of a uniform quantizer. (10)

12. (a) (i) Define channel capacity. (4)

Explain the Shannon's channel coding theorem for a discrete memory less channel. (6)

(ii) Consider a voice channel being used to transmit digital data with bandwidth 3100HZ. The SNR of a typical voice grade line is 30dB. What is the channel capacity in bits per second? (6)

Or

(b) (i) Consider the convolutional encoder shown in figure below with rate 1/2 and constraint length of 3. Determine the encoder output for the message sequences 10011. (8)
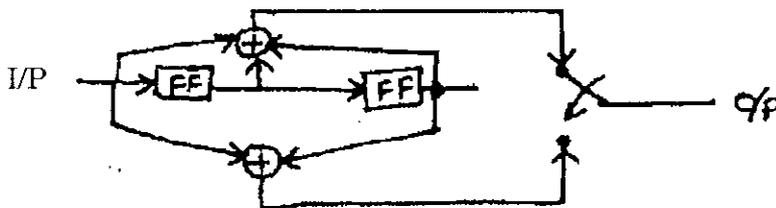
(ii) Draw the trellis diagram and the state table for the encoder. (8)

13. (a) (i) Name the guided and unguided transmission media. (4)

(ii) Discuss the transmission characteristics and applications of three types of guided media commonly used for data transmission. (12)

Or

(b) (i) Describe synchronous transmission of data. Compare its advantages over asynchronous transmission. (12)

(ii) Distinguish between half duplex and full duplex transmissions. (4)

14. (a) (i) Explain how amplitude, frequency and phase variations are used for transmitting digital data using analog signals. (8)

(ii) Compare the performance of the above schemes on the basis of transmission bandwidth and Eb/No. (8)

Or

(b) (i) Draw the block diagram of a PCM system and explain function of each block. (8)

(ii) What is Delta Modulation? Explain its differences and disadvantages compared to PCM. (8)

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15. (a) Explain with diagrams the stop and wait flow control and sliding window flow control. (16)

Or

(b) (i) Explain synchronous Time Division Multiplexing. Describe how error and flow control are accomplished. (8)

(ii) Explain the mechanism of error control using stop and wait ARQ. (8)

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