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Question Paper Code : 10262

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2012.

Third Semester

Computer Science and Engineering

CS 2204/141304/CS 36/EC 1207/10144 CS 305/080230008 — ANALOG AND DIGITAL COMMUNICATION

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define modulation and modulation index.
2. What is the purpose of limiter in FM receiver?
3. Draw 8-QAM phasor diagram.
4. Determine the peak frequency deviation and minimum bandwidth for a binary FSK signal with a mark frequency of 49 KHz, a space frequency of 51 KHz.
5. Determine the Nyquist rate for analog input frequency of
 - (a) 4 KHz
 - (b) 10 KHz.
6. Define companding.
7. What is the need for data modems?
8. Mention the difference between line coding and channel coding.
9. Define Process gain and Jamming margin.
10. Give an example to PN sequence.

PART B — (5 × 16 = 80 marks)

11. (a) Draw the block diagram and explain generation of DSB-SC signal using balanced modulator. If the percentage modulation is 100%, how much percentage of the total power is present in the signal when DSB-SC is used.

Or

- (b) Define FM and PM modulation and write their equations. Describe the generation of FM wave using Armstrong method.

12. (a) Explain the generation and detection of PSK system with the help of block diagrams.

Or

- (b) Describe the coherent detection procedure of M-ary PSK and obtain the expression for the probability of symbol error.

13. (a) Draw the block diagram and explain the principle of operation of a PCM system. A binary channel with bit rate = 36000 bits/sec is available for PCM voice transmission. Find number of bits per sample, number of quantization levels and sampling frequency assuming highest frequency component of voice signal is 3.2 KHz.

Or

- (b) Discuss linear delta modulation using block diagram and derive expression for $\frac{S}{N}$ ratio.

14. (a) Explain source coding theorem. Consider five messages S_0, S_1, S_2, S_3, S_4 given by the probabilities $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{16}$. Use the Shannon-Fano algorithm to develop an efficient code.

Or

- (b) Discuss asynchronous type modem requirements. Explain working principle of these modems. Explain error correction capability of block codes.

15. (a) Describe the structure of feedback shift register for generating PN sequences. Give the advantages associated with spreading a signal spectrum.

Or

- (b) (i) Explain the concept of synchronization and tracking of frequency hopping spread spectrum signals. (10)
- (ii) Mention merits and demerits of time division multiplexing. (6)

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