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Question Paper Code : T3029

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009

Third Semester

Computer Science and Engineering

CS 2204 — ANALOG AND DIGITAL COMMUNICATION

(Regulation 2008)

Time : Three hours

Maximum : 100 Marks

Answer ALL Questions.

PART A — (10 × 2 = 20 Marks)

1. Draw the waveforms of AM signal and DSB-SC signal.
2. What is the required bandwidth for FM signal, in terms of frequency deviation?
3. Draw the phasor diagram of QPSK
4. Define information capacity and bit rate.
5. Draw PWM and PPM waveforms.
6. Draw the Eye pattern and indicate how ISI is measured from it.
7. Compare the merits and demerits of error detection and correction.
8. Give typical CRC-16 generating circuit.
9. Define effective jamming power and processing.
10. What is the principle of frequency hopping spread spectrum?

PART B — (5 × 16 = 80 Marks)

11. (a) Derive expression for AM wave. Define modulation index and express its value in terms of maximum and minimum voltage values of signal. Draw the spectrum and time-domain signal of AM wave.

Or

Handwritten notes: $\frac{11}{52} \frac{98}{56}$

Handwritten notes: $\frac{58}{4x} \frac{12}{5} \frac{91}{1}$

(b) Define FM and PM modulation. Write down their equations. Describe suitable mechanism that can produce PM from FM modulator.

12. (a) Draw the block diagram of FSK receiver and explain the operation. Determine the : (i) peak frequency deviation (ii) minimum bandwidth (iii) baud for FSK signal with a mark frequency of 49 kHz, space frequency of 51 kHz, and input bit rate of 2 kbps.

Or

(b) Draw the block diagram of QPSK modulator and explain its operation. For QPSK modulator, construct the truth table, phasor diagram and constellation diagram.

13. (a) What is companding? Explain analog companding process with the help of block diagram.

Or

(b) How does delta modulation differ from PCM? Explain delta modulation transmitter with the help of a block diagram.

14. (a) Explain the difference between error detection and error correction. Determine the BCS for the following data and CRC generating polynomials.

$$\text{Data } G(x) = x^7 + x^5 + x^4 + x^2 + x^1 + x^0$$

$$\text{CRC } P(x) = x^5 + x^4 + x^1 + x^0$$

Or

(b) Discuss UART transmitter and receiver in detail. Under what conditions, asynchronous mode of data transfer is better?

15. (a) With the help of block diagram explain how DSSS can be implemented. Draw the input and output waveforms.

Or

(b) Explain the frequency - hopped spread spectrum with a block diagram. How PN sequences are generated?