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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

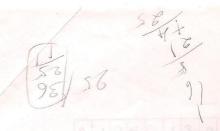
Answer ALL Questions.

PART A — $(10 \times 2 = 20 \text{ Marks})$

- 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.
- 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 — $(5 \times 16 = 80 \text{ Marks})$

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.



- (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.
- Determine the BCS for the following data and CRC generating polynomials.

Data
$$G(x) = x^7 + x^5 + x^4 + x^2 + x^1 + x^0$$

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?