D 50610

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FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, NOVEMBER 2013

EC 09 504 – DIGITAL COMMUNICATION

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.

1. State sampling theorem.

2. Draw a RZ polar waveform for the bit stream 110101.

3. State the purposes of a scrambler.

4. What is a matched filter?

5. Draw a PSK waveform for the bit stream 110101.

(5 × 2 = 10 marks)

Part B

Answer any four questions.

1. (a) Derive the expressions for the quantisation noise in PCM, granular noise in DM.

   (b) State the conditions to avoid slope overload error in DM and ADM.

2. Explain the fact that inter symbol interference cannot be avoided.

3. Explain any *one* method of carrier synchronisation.

4. Discuss any *four* properties of pseudo noise sequence.

5. Explain μ law and A law companding characteristics.

6. Calculate the bit error probability of a coherent ASK receiver.

(4 × 5 = 20 marks)

Part C

Answer all questions.

1. Explain the generation of PPM and PWM signals.

Or

2. Derive the general expression for the power spectral density of a line code.

Turn over

3. State and derive the Nyquist first criterion for Zero ISI.

Or

4. Write notes on :

    (a) Eye diagram.

    (b) Scrambler.

5. Derive the expression for bit error probability of a matched filter.

Or

6. Explain the generation of a direct sequence spread spectrum.

7. Derive the bit error probability of :

    (a) Coherent FSK receiver.

    (b) Coherent PSK receiver.

Or

8. Compare the performance of ASK, FSK, PSK and MSK receivers.

$(4 \times 10 = 40 \text{ marks})$