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Question Paper Code : 27199

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Fifth Semester

Electronics and Communication Engineering

EC 6501 — DIGITAL COMMUNICATION

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State sampling theorem for band-limited signals and the filter to avoid alaising.
2. Write the two fold effects of Quantization Process.
3. Define APF and APB.
4. Write the limitations of delta modulation.
5. List the properties of syndrome.
6. Compare M-ary PSK and M-ary QAM.
7. Draw a block diagram of a coherent BFSK receiver.
8. Distinguish BPSK and QPSK techniques.
9. State channel coding theorem.
10. List the properties of cyclic codes.

PART B — (5 × 16 = 80 marks)

11. (a) Describe the process of sampling and how the message signal is reconstructed from it's samples. Also illustrate the effect of aliasing with neat sketch. (16)

Or

(b) Describe PCM waveform coder and decoder with neat sketch and list the merits compared with analog coders. (16)

12. (a) (i) Describe and illustrate Delta modulation and its quantization error. (8)

(ii) Explain how Adaptive delta modulation performs better and gains more SNR than Delta modulation. (8)

Or

(b) Illustrate how the adaptive time domain coder codes the speech at low bit rate and compare it with the frequency domain coder. (16)

13. (a) (i) Describe modified duobinary coding technique and its performance by illustrating it's frequency and impulse responses. (10)

(ii) Determine the power spectral density for NRZ bipolar and unipolar data formats. Assume that 1s and 0s in the input binary data occur with equal probability. (6)

Or

(b) (i) Describe how eye pattern illustrates the performance of a data transmission system with respect to inter symbol interference with neat sketch. (10)

(ii) Illustrate the modes of operation of an adaptive equalizer with neat block diagram. (6)

14. (a) Illustrate the transmitter, receiver and signal space diagram of Quadrature Phase Shift Keying and describe how it reproduces the original sequence with the minimum probability of symbol error with neat sketch. (16)

Or

(b) Illustrate the transmitter, receiver and the generation of the non coherent version of PSK with neat sketch. (16)

15. (a) For a systematic linear block code, the three parity check digits P_1, P_2, P_3 are given by $Pk,_{n-k} = \begin{bmatrix} 101 \\ 111 \\ 110 \\ 011 \end{bmatrix}$

(i) Construct generated matrix

(ii) Construct code generated by the matrix

(iii) Determine error correcting capacity

(iv) Decode the received words with an example. (16)

Or

(b) A convolution code is described by g1 = [1 0 0]; g2 = [1 0 1]; g3 = [1 1 1]

(i) Draw the encoder corresponding to this code.

(ii) Draw the state transition diagram for this code

(iii) Draw the Trellis diagram

(iv) Find the transfer function. (16)
