Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 73450

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Fifth Semester

Electronics and Communication Engineering

EC 2301/EC 51 — DIGITAL COMMUNICATION

(Regulations 2008)

(Common to PTEC 2301 – Digital Communication for B.E. (Part-Time) Fourth Semester – Electronics and Communication Engineering – Regulations 2009)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Draw a typical digital communication system.

2.   How can BER of a system be improved?

3.   State sampling theorem for low pass signals.

4.   What is meant by quantization?

5.   Define constraint length of a convolutional code.

6.   State any two requirements of line codes.

7.   Define false alarm and false dismissal errors.

8.   What is eye pattern?

9.   Mention the drawbacks of amplitude shift keying.

10. What are coherent systems?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Briefly write on various analog pulse communication systems. (10)

    (ii) Explain the channel classification. (6)

    Or

    (b) (i) Briefly explain on geometric representation of signals. (8)

    (ii) Explain the mathematical models of communication channel. (8)

12. (a) Describe temporal and spectral waveform encoding methods. (16)

    Or

    (b) Explain the process of quantization and obtain an expression for signal to quantization ratio in the case of a uniform quantizer. (16)

13. (a) (i) Explain the error detecting and correcting capabilities of linear block code. (6)

    (ii) Consider a (7, 4) linear block code whose parity check matrix is given by $H = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$.

    (1) Find the generator matrix.
    (2) How many errors this code can detect?
    (3) How many errors can this code be correct?
    (4) Draw circuit for encoder and syndrome computation. (2 + 2 + 2 + 4)

    Or

    (b) (i) Explain the transform domain approach analysis of convolutional code. (6)

    (ii) Derive the power spectral density of polar signaling and explain. (10)

14. (a) Explain modified duo-binary signalling scheme without and with precoder. (16)

    Or

    (b) Explain the working of a correlator type receiving filter. (16)

15. (a) Derive the expressions for bit error probability of the following receivers:
    (i) Coherent ASK (8)
    (ii) Non-coherent FSK. (8)

    Or

    (b) Derive the expressions for the bit error probability of the following receivers
    (i) QPSK (8)
    (ii) Coherent PSK. (8)

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