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Question Paper Code : 91405

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Fifth Semester

Electronics and Communication Engineering

EC 2301/EC 51 — DIGITAL COMMUNICATION

(Regulation 2008)

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

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the application of pulse communication systems.

2. Define channel capacity.

3. What is difference between natural and flat top sampling?

4. What is temporal waveform coding?

5. What is Manchester coding? What are its advantages?

6. What is the need for error control codes?

7. What is the function of an equalizing filter?

8. What is inter symbol interference?

9. Draw constellation diagram of QAM.

10. Mention the advantages of PSK systems.

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PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss the advantages and disadvantages of digital communication and give a functional description of a digital communication system. (10)

(ii) Explain how channels can be classified. (6)

Or

(b) (i) Explain geometric representation of signals. (8)

(ii) Describe the different mathematical models of a communication channel. (8)

12. (a) (i) Explain Nyquist sampling theorem and how the message can be reconstructed from its samples with an example. (10)

(ii) Explain the practical limitations in sampling and reconstruction. (6)

Or

(b) (i) Explain the principle of quantization and obtain the expression for the signal to quantization noise for the case of a uniform quantizer. (8)

(ii) Explain the spectral waveform encoding methods. (8)

13. (a) (i) Explain the generation of (n,k) block codes and how block codes can be used for error control. (10)

(ii) Consider a (6,3) block code and explain how error syndrome helps in correcting a single error for a data 110. (6)

Or

(b) Describe how convolutional codes can be generated with an example. Draw and explain the tree diagram and trellis diagram representation of convolutional codes. (16)

14. (a) (i) Describe the principle of signal reception using a correlator type receiver. (8)

(ii) Explain the important properties of a matched filter. (8)

Or

(b) (i) Describe how eye pattern can be obtained and can be used for observing the characteristics of a communication channel. (8)

(ii) Explain the function of maximum likelihood detector. (8)

15. (a) (i) Explain QPSK modulation. Describe with a block diagram the operation of a QPSK Transmitter. (10)

(ii) Explain the bandwidth considerations of QPSK. (6)

Or

(b) (i) Describe noncoherent and coherent FSK demodulation. (10)

(ii) Obtain the probability of error of a FSK system. (6)

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