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**Question Paper Code : 60452**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

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. Define measure of information.

2. What is meant by symmetric channel?

3. State Nyquist sampling theorem.

4. Why is quantisation needed in coding the samples?

5. What is line coding?

6. Define code rate of a block code.

7. A 64 kbps binary PCM polar NRZ signal is passed through a communication system with a raised-cosine filter with roll-off factor 0.25. Find the bandwidth of the filtered PCM signal.

8. State any two applications of eye pattern.

9. What are coherent and non coherent receivers?

10. What is memory-less modulation? Give examples of two such methods.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the various analog pulse communication system describing their advantages and drawbacks. (8)

(ii) Describe how channels can be classified and briefly explain each. (8)

Or

(b) (i) Describe the elements of a digital communication system. (8)

(ii) Explain the mathematical models of various communication channels. (8)

12. (a) (i) Explain what is natural sampling and flat-top sampling. (6)

(ii) With neat block diagram, pulse code modulation and demodulation system. (10)

Or

(b) (i) Explain the noises in delta in modulation systems. How to overcome this effect in Delta modulation? (8)

(ii) Draw the block diagram of adaptive sub-band coding scheme for speech signal and explain. (8)

13. (a) Derive the expression for power spectral density of unipolar NRZ line code. Hence discuss its characteristics.

Or

(b) (i) Design a block code for a message block of size eight that can correct for single errors. (6)

(ii) Design a convolutional coder of constraint length 6 and rate efficiency $\frac{1}{2}$. Draw its tree diagram and trellis diagram. (10)

14. (a) (i) Explain the bit synchronisation. (10)

(ii) Write notes on eye diagram. (6)

Or

(b) Discuss Nyquist solutions to eliminate ISI.

15. (a) Derive the bit error probability of coherent ASK, FSK, PSK receivers.

Or

(b) Derive the bit error probability of QPSK Receiver.

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