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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.

 $PART A - (10 \times 2 = 20 \text{ marks})$

- 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 — $(5 \times 16 = 80 \text{ marks})$

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)			
			\mathbf{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)			
			\mathbf{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 code. Hence discuss its characteristics.				
			\mathbf{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)			
			\mathbf{Or}			
	(b)	Disc	cuss Nyquist solutions to eliminate ISI.			
15 .	(a)	Deri	ve the bit error probability of coherent ASK, FSK, PSK receivers.			
			Or			

Derive the bit error probability of QPSK Receiver.