

Question Paper Code: 51452

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 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. State any four techniques to improve the BER of a communication system.
- 2. Define basis set.
- 3. An analog waveform with maximum frequency content of 3 kHz is to be transmitted over an M-ary PCM system, where M = 16. What is the minimum number of bits/sample that should be used in digitizing the analog waveform? (The quantisation error is specified not to exceed ± 1% of the peak-to-peak analog signal)
- 4. Differentiate the principles of temporal waveform coding and model-based coding.
- 5. Define Hamming distance and Hamming weight.
- 6. Define constraint length of a convolutional coder.
- Mention two properties of matched filter.

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9.	Wha	at are t	the drawbacks of binary PSK system ?	
10.	Wha	at is m	neant by coherent and non-coherent detection?	
			Question Paper Cades 51452 -	
			$PART - B (5 \times 16 = 80 \text{ marks})$	
11.	(a)	(5)		
11.	(a).	(i)	Explain Gram-Schmidt orthogonalisation procedure.	(12)
	*	(ii)	State and explain the dimensionality theorem.	(4)
			OR THE OR THE ORDER OF THE ORDE	
	(b)	(i)	Explain the mathematical models of any three communication channels.	
		(ii)	Define the terms:	
			(1) Half-power bandwidth	
			(2) Noise-equivalent bandwidth	
			(3) Absolute bandwidth	
			1215 (ALIE VALLE - 1 ALIE - 1	
			(4) Bounded power spectral density.	
			to start our recomments is not been an execution as comments of the page	
12. (a)	Expla	ain a DPCM system. Derive the expression for slope overload noise of the	ne
		syster	m. Show that SNR of DPCM is better than that of PCM.	
			or in the state of	
	b)		Explain subband coding.	
		(ii)	Compare the performance of various speech encoding methods.	
			most was in they make to make your to recover he exist a may wis our femonities	(8)
13. (2	a)	Descri	the the stens involved in the generation CV	
		explai	ibe the steps involved in the generation of linear block codes. Define an in the properties of syndrome.	
			OR	(16)
			Menucotty proporties of marched filters Av	
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	(b)	(i)	Explain how convolutional codes can be generated. Illustrate with an example.	1 (8)
		(ii)	For a convolutional encoder of constraint length 3 and rate 1/2, obtain the encoded output for the input message 10011.	
14.	(a)	Der	ive the bit error probability of a matched filter.	
			OR	
	(b)	Exp	plain the Nyquist first criterion for IS1 elimination.	
15.	(a)	(i)	Derive the power spectral density of binary ASK signal.	(6)
		(ii)	Draw the block diagram of QPSK transmitter and receiver. Explain the	
			function of various block	(10)
			OR	
	(b)	(i)	Draw the functional block diagram of modulator for QAM and explain	
			its operation.	(8)
		(ii)	Derive the expression for error-probability of QAM system.	(8)
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