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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, APR/MAY 2024

ELECTRONICS AND COMMUNICATION ENGINEERING
IV Semester
EC7351 & COMMUNICATION THEORY

(Regulation2015)

Time:3hrs

Max.Marks: 100

PART- A(10x2=20Marks)
(Answer all Questions)

Q.No	Questions	Marks
1	How do classify the AM signal based on the modulation index?	2
2	Distinguish between high level and low level modulation.	2
3	State the Carson's rule to determine the bandwidth of FM.	2
4	Compare the frequency modulation and phase modulation.	2
5	State central limit theorem.	2
6	Give the conditions to be satisfied for wide sense stationary.	2
7	Discuss the need for pre-emphasis and de-emphasis.	2
the 8	Define noise figure and noise equivalent temperature.	2
9	State the Nyquist sampling Theorem with an equation.	2
10	Compare PCM, DPCM and ADPCM	2

PART- B(5x 13=65Marks)
(Restrict to a maximum of 2 subdivisions)

Q.No	Questions	Marks
11 (a) (i)	Describe the concepts of AM modulation and derive the equation of an AM wave. Draw the phasor diagram, spectrum and modulated AM wave for various degrees of modulation index.	13
	(OR)	
11 (b) (i)	Explain the block diagram of the super heterodyne receiver with a neat block diagram.	13
12 (a) (i)	What are the methods of FM generation and explain a direct method to generate an FM signal.	13
	(OR)	
12 (b) (i)	Explain the operation of PLL as a FM demodulator	13
13 (a) (i)	Illustrate the terms mean, correlation, covariance and ergodicity.	7
(ii)	Interpret the process of autocorrelation and explain the properties of autocorrelation function.	6
	(OR)	
13 (b) (i)	What is power spectral density? Derive the expression and state its properties.	13
14 (a) (i)	The three amplifiers 1,2 and 3 have the following characteristics:F1=9dB, G1=48dB, F2=6dB,G2=35dB,F3=4dB, G3=20dB.The amplifiers are connected in cascade. Find noise figure and equivalent noise temperature	13
	(OR)	
14 (b) (i)	Deduce the expression for figure of merit of DSB-SC receiver using coherent detection.	13
15 (a) (i)	Illustrate the principle of quantization and obtain the expression for the signal	13

	to quantization noise ratio in PCM system.	
	(OR)	
15 (b) (i)	Explain the Delta modulation with neat diagram and also discuss about how to avoid the noises present in Delta modulation.	**13**

PART- C(1x 15=15Marks)

(Q.No. 16 is Compulsory)

Q.No	Questions	Marks
16 (i)	Sketch the balanced modulator circuit for the generation of DSB-SC AM and explain its operation..	**10**
(ii)	In a super heterodyne receiver the input AM signal has a center frequency of 1425 kHz and bandwidth 10kHz. The input is down converted to 455 kHz. Evaluate the value of image frequency	**5**