

Roll No.

B.E / B.Tech (FULL-TIME) EXAMINATIONS, APRIL/MAY 2013

ELECTRONICS & COMMUNICATION ENGINEERING

V SEMESTER, REGULATIONS : R-2004

EC 371 COMMUNICATION THEORY AND SYSTEMS

31

Time : 3 Hours

Max. Marks: 100

Answer ALL questions

Part-A

(10x2=20 Marks)

1. What is DSBSC?
2. Give the principles of FDM?
3. State the advantages of FM over AM?
4. A Frequency modulated wave with a carrier frequency of 200 MHz is modulated using a sinusoid of frequency 15 KHz. The modulation index is 2. Obtain the transmission bandwidth.
5. Assume that a zero mean AWGN of power spectral density $N_0/2$ is passed through an ideal band pass filter of centre frequency f_c and bandwidth $2B$. Obtain the expression for the autocorrelation function of the filtered noise.
6. What is it meant by FM threshold effect?
7. Define quadrature sampling.
8. What is quantization noise?
9. How does subband coding achieve a reduction in bit rate?
10. What is Transform coding?

Part-B

(5x16=80 Marks)

- 11.(i) With block diagram explain the working of a superheterodyne receiver and list the merits and demerits. (12)
- (ii) Explain Hilbert transform, SSB and VSB signals. (4)
- 12.(a)(i) Compare the difference between angle modulation and amplitude modulation. (6)
- (ii) Describe the PLL FM demodulation with necessary block diagram and expressions and also mention the applications. (10)

OR

- 12.(b)(i) A carrier frequency modulated with a sinusoidal signal of 2 KHz resulting in a maximum frequency deviation of 5 KHz. Find the modulation index and bandwidth of the modulation signal. (6)
- (ii) With block diagram explain the narrow band and wide band FM with spectrum. (10)

- 13.(a)(i) Explain pre-emphasis and de-emphasis in FM. (8)
(ii) Compare the noise performance of AM and FM systems. (8)

OR

- 13.(b)(i) Derive the expression for figure merit of a FM receiver. (10)
(ii) Write a note on FM threshold effect and FM threshold reduction. (6)

- 14.(a)(i) Obtain an expression for the Mean Square Error of a non-uniform quantizer. (12)
(ii) Obtain the expression for the $(SNR)_Q$ at the output of an uniform quantizer fed with an input signal of Gaussian pdf. (4)

OR

- 14.(b)(i) State sampling theorem. (4)
(ii) Describe the logarithmic companding of speech signal and vector quantization. (12)

- 15.(a) With necessary diagram explain adaptive DPCM in detail. (16)

OR

- 15.(b) Write explanatory notes about the following:
(i) PCM (8)
(ii) Subband coding of speech signals (8)
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