Reg. No. : | | | | | | | | | | |

Q 2207

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Fifth Semester

Electronics and Communication Engineering

EC 332 — COMMUNICATION THEORY AND SYSTEMS

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. State any two important spectral properties of periodic power signals.

2. Define Amplitude Modulation. Give the expression for AM wave.

3. Determine the peak phase deviation (m) for a PM modulator with a deviation sensitivity k = 2.5 rad/v and a modulating signal $v_m(t) = 2\cos(2\pi 2000t)$.

4. State Carson's Rule.

5. Define Thermal Noise.

6. Define Noise equivalent Bandwidth.

7. What is sensitivity and selectivity of receivers?

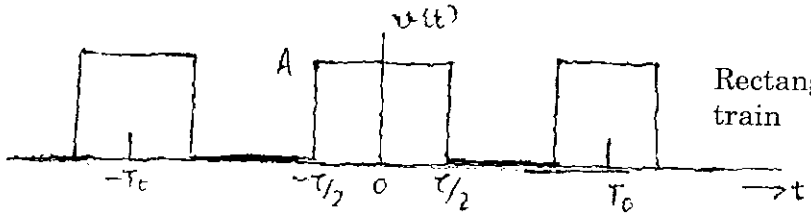
8. Define threshold effect in FM.

9. Define Entropy.

10. Define Information Rate.

PART B — (5 × 16 = 80 marks)

11. (a) Find the fourier coefficients and draw the amplitude and phase spectrum for the following periodic train of rectangular pubes. (16)

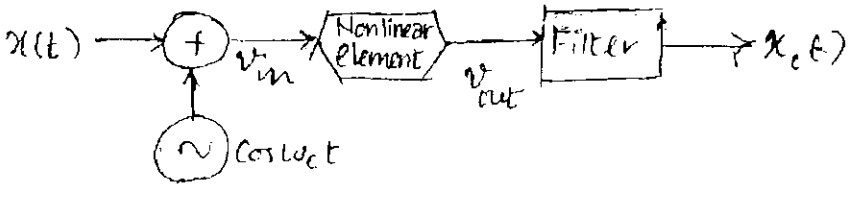


Rectangular pulse train

Or

(b) (i) Explain in detail about the balanced modulator with block diagram. (8)

(ii) The signal $x(t)=\frac{1}{2}\cos 2\pi 70t+\frac{1}{2}\cos 2\pi 120t$ is input to the square-law modulator system given in fig. with a carrier frequency of 10 kHz. Determine the output. (8)



12. (a) Explain the direct FM generation using varactor diode and VCO. (16)

Or

(b) (i) Explain in detail about Balanced Discriminators. (8)

(ii) Phase-shift discriminators. (8)

13. (a) Explain in detail about the thermal noise and available power spectral density. (16)

Or

(b) Explain in detail about the white noise and filtered noise. (16)

14. (a) With neat block diagrams, explain the principle of working of the superheterodyne receivers. (16)

Or

(b) Derive the signal to noise ratio of DSB-SC detection using synchronous detection. Also compare with the SSB and VSB detections. (16)

15. (a) Prove that the information transfer over a Binary Symmetric channel depends on both the error probability and the source probability. (16)

Or

(b) Explain in detail about the Encoding system for a noiseless discrete channel. (16)