T 8163

B.E /B.TECH. DEGREE EXAMINAITON, NOV/DEC 2006.

Fifth Semester

Electronics and Communication Engineering

EC 1301 – COMMUNICATION THEORY

(Common to B.E . (Part-Time) Fourth Semester Regulation 2005)

Time: Three hours Maximum: 100 marks

Answer ALL Questions

PART A – (10 X 2 = 20 marks)

1. Draw the circuit of an envelop detector.
2. What is mid frequency of IF section of AM receivers and its Bandwidth?
3. Draw the phasor diagram of narrow band FM.
4. What are the applications of phase locked loop?
5. Define thermal noise. Give the expression for the thermal noise voltage across a resistor.
6. What is meant by figure of merit of a receiver?

7. What are called extended threshold demodulators?

8. What is the purpose of pre emphasis and de emphasis in Fm?

9. Define Entrophy.

10. What is a prefix code?

PART B- (5 X 16 = 80 marks)

11. (a) What are the advantages of super heterodyne receiver over TRF receiver? Draw the diagram of super heterodyne receiver and explain the functions of each block. (16)

Or

(b) (i) Draw the circuit diagram of a ring modulator and explain its operation . (8)

(ii) Discuss coherent detection of DSB-SC modulated wave with a block diagram of the detector. (8)

12. (a) (i) Derive the expression for the frequency modulated signal. Explain what is meant
by narrow –band FM and wide-band FM using the expression .

(ii) Discuss the indirect method of generating a wide-band FM signal.

Or

(b) Draw the circuit diagram of Foster-seeley discriminator and explain its working.(16)

13. (a) (i) What is meant by noise equivalent bandwidth? Illustrate it with a diagram. (8)

(ii) What is a narrow band noise ? Discuss the properties of the quadrature components of a narrow-band noise.

Or

(b) (i) Derive the expression for output signal-to-noise for a DSB-SC receiver using coherent detection . (8)

(ii) Write short notes on noise in SSB receivers. (8)

14. (a) (i) Explain the noise in AM receiver using its noisy model block diagram. (8)

(ii) What are pre emphasis and de emphasis in FM? Draw suitable circuits and Explain. (8)

Or

(b) (i) Explain the capture effect and FM threshold effect. (6)

(ii) Draw the block diagram of FM demodulator and explain the effect of noise in detail and compare the performance of AM and FM in the presence of noise (10)

15 (a) (i) What is entropy ?Explain the important properties of entropy.

(ii) Five symbols of the alphabet of a discrete memory less source and their probabilities are given below:

$[s] = [s_o, s_1 s_2, s_3, s_4]$

$[P(s)] = [0.4, 0.2, 0.2, 0.1, 0.1]$

Code the symbol using Huffman coding.

Or

(b) (i) Define mutual information. Find the relation between the mutual information and the joint entropy of the channel input and channel output. (12)

(ii) What are the implications of information capacity theorem? (4)