

**2006 ANNA UNIVERSITY**  
**B.E/B.TECH V SEMESTER DEGREE EXAMINATION**  
**ELECTRONICS AND COMMUNICATION ENGINEERING**  
**COMMUNICATION THEORY**

TIME 3 HOUR  
MARK 80

ANSWER ANY ALL QUESTION

**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? T 8163
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.  
Or  
(b) (i) Draw the circuit diagram of a ring modulator and explain its operation .  
(ii) Discuss coherent detection of DSBSC modulated wave with a block diagram of the detector.
12. (a) (i) Derive the expression for the frequency modulated signal. Explain what is meant by narrow -band FM and wideband FM using the expression .  
(ii) Discuss the indirect method of generating a wideband FM signal.  
Or  
(b) Draw the circuit diagram of Fosterseeley discriminator and explain its working.
13. (a) (i) What is meant by noise equivalent bandwidth? Illustrate it with a diagram.  
(ii) What is a narrow band noise ? Discuss the properties of the quadrature components of a narrowband noise.  
Or  
(b) ( i) Derive the expression for output signal to noise for a DSBSC receiver using coherent detection .  
(ii) Write short notes on noise in SSB receivers.
14. (a) (i) Explain the noise in AM receiver using its noisy model block diagram.  
(ii) What are pre emphasis and de emphasis in FM? Draw suitable circuits and Explain.  
Or  
(b) (i) Explain the capture effect and FM threshold effect.

(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

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: 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.

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

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