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

R 3300

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

Fifth Semester

(Regulation 2004)

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 × 2 = 20 marks)

1. What are the advantages of super heterodyne receiver over TRF receiver?

2. A transmitter radiates 9 kW without modulation and 10.125 kW after modulation. Determine depth of modulation.

3. Define Phase modulation.

4. What is Narrowband FM?

5. Define Shot noise.

6. What is white noise?

7. What is FM threshold effect?

8. Define Pre-emphasis and De-emphasis.

9. Define information rate.

10. What is channel capacity of Binary Synchronous Channel with error probability of 0.2?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw the filtering scheme for the generation of VSB modulated wave and Explain. (6)

(ii) Explain the double side suppressed carrier modulation technique. (10)

Or

(b) (i) Explain Frequency Translation. (8)

(ii) Discuss Frequency Division Multiplexing. (8)

12. (a) Explain how FM wave is generated by Indirect method. (16)

Or

(b) Discuss in detail FM stereo multiplexing. (16)

13. (a) (i) How sine wave pulse noise is represented. Obtain the Joint pdf of such noise component. (10)

(ii) Explain concept of noise equivalent Bandwidth. (6)

Or

(b) Discuss in detail the Noise performance in SSB-SC receiver. (16)

14. (a) (i) Derive the output SNR for envelope detection. (8)

(ii) Explain the FM receiver with block diagram. (8)

Or

(b) Compare the performance of noise in AM and FM systems. (16)

15. (a) (i) A Channel has the following matrix :

$$P(Y/X) = \begin{pmatrix} 1-p & p & 0 \\ 0 & p & 1-p \end{pmatrix}$$

Draw the channel diagram. If the source has equally likely outputs, compute the probability associated with the channel outputs for $p = 0.2$. (14)

(ii) What is entropy? (2)

Or

(b) (i) What is the capacity of the Discrete memory less channel? (2)

(ii) A Discrete memory less channel has the following alphabet with probability of occurrence.

Symbol	:	S_0	S_1	S_2	S_3	S_4	S_5	S_6
Probability	:	0.125	0.0625	0.25	0.0625	0.125	0.125	0.25

Generate the Huffman code. Find average encoded Length, entropy and η. (14)