Code No. 3307

FACULTY OF INFORMATICS

B.E. 2/4 (I.T.) II-Semester (Supplementary) Examination, January 2011

ELECTRONIC COMMUNICATION TECHNIQUES

Time : Three Hours]　　　　　　　　　　　　　　　　　　[Maximum Marks : 75

Note :— Answer *all* questions from Part A. Answer any *five* questions from Part B.

PART—A (Marks : 25)

1. Explain the need for modulation in Electronic Communications System. 　2

2. For an AMDSBFC wave with a peak unmodulated carrier voltage $V_c = 10 V_p$, a load resistance $R_L = 10\ \Omega$ and a modulation coefficient m = 1, determine :
   (a) Total sideband power, (b) Total power of the modulated wave. 　3

3. Compare and contrast FDM and TDM. 　2

4. Define the following terms :
   (a) Bandwidth improvement, (b) Insertion loss, (c) Fidelity of a receiver. 　3

5. Determine the peak frequency deviation (Δf) and modulation index (m) with a deviation sensitivity $K_1 = 5$ kHz/V and a modulating signal $V_m(t) = 2 \cos (2\pi 2000t)$. 　3

6. Define preemphasis and deemphasis . 　2

7. Differentiate Natural sampling and Flat top sampling. 　3

8. Explain pulse amplitude modulation. 　3

9. For a single-channel PCM system with a sample rate $f_s = 6000$ samples per second and a seven-bit compressed PCM code, determine the line speed. 　2

10. Contrast delta modulation PCM and standard PCM. 　2

PART—B (Marks : 50)

11. (a) Explain the operation of a low-level AM modulator with the help of neat block diagram. 6
    (b) Describe the relationship between the carrier and sideband powers in an AMDSBFC wave. 　4

12. (a) Draw the block diagram and describe the operation of a filter type SSB transmitter. 5
    (b) Describe the operation of a balanced ring modulator. 5

13. (a) Draw the block diagram for a phase-locked loop FM transmitter and describe its operation. 6

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(b) Determine the modulation indexes for an FM modulator and PM modulator whose deviation sensitivities are $K_1 = 1 \cdot 5$ kHz/V and $K = 0 \cdot 75$ rad/V respectively, carrier frequency $f_c = 500$ kHz and modulating signal $V_m = 2 \sin ((2 \pi 2 \text{kt})$.   4

14. (a) Draw the schematic diagram for a Foster-Seeley discriminator and describe its operation. 7

    (b) Describe FM thresholding.   3

15. (a) State and prove Sampling theorem.   5

    (b) Explain signal recovery through holding.   5

16. (a) Explain continuously variable slope delta modulation.   6

    (b) Define slope overload and granular noise.   4

17. Write short notes on :—

    (a) DPSK, (b) pLL-capture range, lock range. $5 \times 2 = 10$