SE-sem-IV -old -EXTC
PCE
10/12/15

(3 Hours) [Total Marks : 100

N.B. : (1) **Question No.1 is compulsory**
    (2) Attempt **any four** questions from remaining **six** questions.
    (3) Assume any suitable data if required.

1. Answer the following (any **four**)   20
    (a) Explain the function of Amplitude limiter in F.M. receiver
    (b) Explain the term companding with respect to PCM.
    (c) How power saving and Bandwidth saving is achieved in SSB-SC system.
    (d) Explain what double spotting is and how it arises?
    (e) Discuss the advantages of Digital communication over analog communication.

2. (a) Explain in brief the operation of Balanced ring modulator   10
    (b) An A.F. Signal $20 \sin(2\pi \times 500t)$ is used to amplitude modulate a carrier of   10
    $50 \sin(2\pi \times 10^5 t)$
    Calculate :-
     (i) Modulation index
     (ii) Sideband frequencies
     (iii) Amplitude of each sideband
     (iv) Bandwidth required

3. (a) Explain the basic principle of FM demodulator with the help of neat block and phasor   10
    diagram explain the same in a foster seely discriminator.
    (b) How do you generate and modulate PAM signal? Is it an analog or digital signal?   10

4. (a) Draw and explain a block diagram of superheterodyne radio receiver, with waveforms   10
    at output of each block.
    (b) What are the advantages of superheterodyne receiver over the TRF receiver? Explain   10
    the terms tracking and image rejection.

5. (a) Discuss the slope over load and Granular noise error in Delta modulation. How it   10
    can be compensated in Adaptive delta modulation.
    (b) Draw the block diagram of a phase cancellation SSB generator and explain how the   10
    carrier and unwanted side bands are suppressed.

6. (a) Explain the difference between :-   10
     (i) Amplitude Modulation and Frequency Modulation
     (ii) Narrow band F.M. and wideband F.M.

QP-Con.-10823 -15   [TURN OVER]

(b) Sketch the circuit diagram of a practical diode detector and explain the operation of it. How is AGC obtained from this detector. 10

7. Write short notes (any **four**) 20
    (a) Pre-emphasis and De-emphasis
    (b) ISB Transmitter
    (c) Sampling Theorem
    (d) TRF receiver
    (e) Quantization and Quantization error