S.E. (Computer & I.T) Sem IV / Rev. 31/5/07

(Library) Principles of Communication Engineering

Con-2334-07. ND-9482

(REVISED COURSE)

(3 Hours) [Total Marks : 100

N.B.(1) Question No. 1 is **compulsory**.
(2) Attempt in all **five** question.
(3) **All** questions carry **equal** marks.
(4) Assume the data if **necessary**.

1. (a) What do you mean by flywheel effect ? 20
(b) Explain the relationship between FM and PM
(c) Compare ground wave propagation with space wave propagation.
(d) What do you mean by double spotting ?

2. (a) Explain with circuit diagram, collector modulated class C transistor amplifier. What are the advantages of collector modulation over base modulation. 10
(b) A 5 kW unmodulated carrier is simultaneously modulated by two audio signals with modulations index 80% and 50%. Find the transmitted power and effective modulation index. Also find the antenna current with and without modulating signal assuming antenna resistance of 50 Ωs. 10

3. (a) Draw the block diagram of a phase cancellation SSB generation and explain how the carrier and unwanted sideband are suppressed. What change is necessary to suppress the other sideband ? 10
(b) Sketch the circuit of a practical diode detector and explain its working. What is negative peak clipping ? Calculate the maximum modulation index that the above detector can tolerate without causing negative peak clipping. 10

4. (a) Explain with circuit diagram, the ratio detector used to demodulated FM. Why ratio detector is preferred over Faster-Seeley detector for FM demodulation ? 10
(b) Derive an expression for frequency modulated waveform. 6
(c) A modulating signal 5 cos 2π 15 $\times$ 10^3t, angle modulates a carrier A cos w_Ct with deviation 75 kHz. Find the modulation index and bandwidth for FM. 4

5. (a) What do you mean by superhetrodyne receiver ? Explain its working with neat waveform. 10
(b) A superhetrodyne receiver having a RF amplifier and an IF of 455 kHz is tuned to 15 MHz. Calculate the Q of the RF amplifier and mixer input circuits, both being the same, if the receiver's image rejection is to be 120. 10

6. (a) Explain the structure of ionosphere with neat diagram. 10
(b) What do you mean by TDM. Compare TDM with FDM. 10

7. (a) What are the various pulse modulation techniques ? Give one method for the generation of PAM. 10
(b) Draw neat block diagram of Delta modulator and explain its working. What are the drawbacks of Delta modulator and how are they overcome by ADM. 10