S.E computer TV Principles of Comm^n Engg 27/5/06

Con. 2111-06. (REVISED COURSE) TV-8127
(3 Hours) [Total Marks : 100

P3/DU/PO/LO E-4-26 39

N. B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** from **remaining** questions.
(3) Assume **suitable additional** data if **necessary** and state them **clearly**.

1. Answer the following :—
   (a) What is meant by signal to noise ratio ? Discuss the importance of SNR in radio receivers. **4**
   (b) What is companding ? **4**
   (c) Explain how image frequency signals are received in a super hetrodye receiver. How can these signals be rejected ? **4**
   (d) Describe the ground wave propagation. **4**
   (e) What is peak clipping and diagonal clipping in diode detectors ? **4**

2. (a) A carrier wave $V_c = 4 \sin [2\pi \times 500 \times 10^3 t]$ is amplitude modulated by an audio wave $V_m = 0.2 \sin [C2\pi x\ 500\ t)] + 0.1 \sin 5 [(2\pi \times 500t)]$. **10**
   Determine the upper and lower sidebands and sketch spectrum of the modulated wave. Find the total power in the sidebands.
   (b) Explain the following :— **10**
   (i) Balance slope detector
   (ii) Delta Modulation.

3. (a) What are different methods for FM generation ? Sketch the circuit and explain the principle of reactance modulator ? Why is direct modulation not preferred for generation ? **10**
   (b) In an FM system, the audio frequency is 1KHz and audio voltage is 2 volts. The deviation is 4 KH_z. If the AF voltage is now increased to 8 volts and its frequency dropped to 500 Hz, find the modulation index in each case and approximate band width of the signal. **10**

4. (a) What is multiplexing in communication system ? Draw the block diagram of TDM—PCM system. Explain each block. Also calculate the bit rate at the output of this system. **10**
   (b) State and prove the sampling theorem for lowpass band limited signal. Compare PAM and PWM. **10**

5. (a) Draw the block diagram of phase cancellation SSB generator and explain how the carrier and unwanted sidebands are supressed. What changes is necessary to supress the other sideband? **10**
   (b) In an AM receiver having no RF stage, the loaded Q of the aerial coupling circuit is 125. If the intermediate frequency is 465 KHz, **10**
   find : (i) The image frequency and its rejection at 1 MHz and 30MHz.
   (ii) The IF required to make the image rejection ratio as good at 30 MHz as it is at 1MHz.

6. (a) (i) Draw the circuit diagram of a Foster-Seeley phase discriminator and explain its principle of operation with the help of relevant waveforms. **6**
   (ii) A continuous time signal $X(t) = 5 \sin 2000\ \pi\ t + 7 \sin 4000\pi t$ is to be sampled. Calculate the minimum sampling frequency. **4**
   (b) How is adaptive delta modulation better than linear delta modulation ? Draw block diagram of adaptive delta modulation and explain each block in detail. **10**

7. (a) Describe the following terms in relation with sky wave propagation. **10**
   (i) Virtual Height
   (ii) Critical Frequency
   (iii) Maximum usable frequency
   (iv) Skip distance.
   (b) Write short notes on the following (any **two**) :— **10**
   (i) Vestigial side band transmission (VSB)
   (ii) FM noise triangle
   (iii) High level AM transmitter.