Code No: NR311302 **NR**

III B.Tech I Semester Supplementary Examinations, November 2006
COMMUNICATION ENGINEERING
(Electronics & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) An AM transmitter has antenna current of 2A with modulation index of 60 percent. What will be the total antenna current if one more identical antenna is connected in parallel with the previous one, keeping the transmitter output same? Will it affect the modulation index?
   (b) An audio frequency signal 10 $\sin(2\pi \times 500t)$ is used to amplitude modulate a carrier of 50 $\sin 2\pi 10^5 t$ to Calculate
      i. Modulation index
      ii. Side band frequencies
      iii. Amplitude of each side band frequencies
      iv. Bandwidth required
      v. Total power delivered to the load of 600 ohms
      vi. Transmission efficiency. [8+8]

2. (a) Explain Balanced slope detector for detecting FM signal.
   (b) The maximum deviation allowed in an FM broadcast system is 75 KHz. If the modulating signal is a single-tone sinusoid of 10 KHz, find the bandwidth of the FM signal. [12+4]

3. (a) Explain the operation of ISB transmitter with block diagram. Where it is used?
   (b) What is the function of crystal filters in SSB transmitter?
   (c) State and explain with respect to 'Q', various types of filters used to separate side bands? [4+6+6]

4. Write short notes on the following:-
   (a) Receiver measurements.
   (b) Squelch circuits.
   (c) Noise limiter. [6+5+5]

5. (a) Derive Noise figure formula for cascaded network
   (b) A mixer circuits has a noise figure of 12 dB. It is preceded by an amplifier that has an equivalent noise temperature of 200 K and a power gain of 30 dB. Calculate the equivalent noise temperature of the combination referred to the amplifier input. [8+8]

6. (a) Explain the generation and demodulation of pulse-position modulation.
   (b) What is meant by Cross-talk? Explain in detail. [10+6]

7. Draw the block diagrams of Adaptive Delta Modulation transmitter and receiver, and explain the operation. [16]

8. Assuming a synchronous transmission control scheme, explain how character and frame synchronization are achieved
   (a) with character oriented transmission.
   (b) With bit oriented transmission. [8+8]

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