Roll No. .....

National Institute of Technology, Delhi
B.Tech (ECE), 4th Semester

Subject: Analog Communication Systems **Time: 1.5** Hrs

Subject Code: ECB-253 **Max. Marks:** 25

Note: Attempt all the questions. Assume the necessary data, if applicable.

Q.1

(a) Determine the Fourier transform of a Sine wave having frequency of f_o and peak amplitude of Unity. Also plot its frequency spectrum.
(b) Prove that in AM, maximum average power transmitted by an antenna is 1.5 times the carrier power.
(c) The antenna current of an AM transmitter is 10 Amp when it is modulated to a depth of 30% by an audio signal. It increases to 11 Amp when another signal modulates the carrier. What is the modulation index due to second wave?
(d) A transmitter (AM-DSBFC) with a carrier power of 10 W at a frequency of 25 MHz operates into a 50 Ohms load. It is modulated at 60% by a 2 kHz sine wave:
  (i) Sketch the signal in frequency domain.
  (ii) Determine the total signal power.
  (iii) Determine RMS voltage of a signal.
(e) Explain various types of distortions in diode detector.

(5*3=15)

Q.2 What is Balanced Modulator? Sketch a Balanced Modulator circuit and explain its working. Derive the expression for its output voltage.

(5)

Q.3 Draw and explain the working of Super heterodyne receiver with suitable waveforms. Discuss its advantages

(5)

**********BEST WISHES**********