

[05 BENG – 2126]

II/IV B.Tech. DEGREE EXAMINATION.

First Semester

Electronics and Communication Engineering

ANALOG COMMUNICATIONS

(Effective from the admitted batch of 2022-2023)

Time : Three hours

Maximum : 70 marks

Question No. 1 is compulsory.

Answering any FOUR from remaining.

All questions carry equal marks.

1.
 - (a) Define modulation index and mention the range of modulation index.
 - (b) Compare the DSB and SSB systems.
 - (c) Explain the terms of Narrow band FM and wide band FM.
 - (d) Draw the general structure of a receiver for noise measurement.
 - (e) Write the main requirements of AM broadcast transmitters.
 - (f) List out the drawbacks of pulse amplitude modulated signal.
 - (g) Draw the waveforms of PPM and PWM signals for a sinusoidal modulating signal.

2. (a) What is the principle of Amplitude modulation? Derive expression for the AM wave and draw its spectrum.
 (b) A carrier signal : $c(t) = 10 \cos(2\pi 10^6 t)$ is modulated by a message signal: $m(t) = 2 \cos(8\pi 10^3 t)$ to generate a DSB-SC signal. Sketch the spectrum and calculate the Bandwidth and Power.
3. (a) Explain clearly about Pre-emphasis and De-emphasis in FM wave.
 (b) What is the difference between direct and indirect methods of FM generation? Explain in detail.
4. (a) Discuss the noise performance of AM system using envelop detection.
 (b) Derive an expression for the S/N ratio for an FM System.
5. (a) What is FM threshold effect? How threshold reduction is achieved in FM receiver.
 (b) List out the advantages of FDM over TDM technique.
6. (a) Explain different modes in a phase locked loop.
 (b) Compare the noise performance of SSB system with that of the DSB-SC system.

7. (a) Discuss the Effects of feedback on the performance of AM Transmitter.
 (b) In a broadcast Super Heterodyne Receiver having no RF amplifier is tuned to 666 kHz. The local oscillator frequency is adjusted to 1020 kHz and the quality factor is 50. Calculate the intermediate frequency, image frequency and image rejection ratio.
8. (a) Explain the procedure for pulse width modulation and demodulation with the help of block diagram.
 (b) Three signals m_1 , m_2 and m_3 are to be multiplexed; m_1 and m_2 have a 50 kHz bandwidth, and m_3 has a 10 kHz bandwidth. Design a commutator switching system so that each signal is sampled at its Nyquist rate.