

BEIT, Part-III (5th Semester) Final Examination, December 2012
Subject – Communication Systems (IT-501)

F.M.= 70

Time= 3 Hrs.

Answer **Q.7** and any **four** questions from the rest

1. (a) What is modulation index for Amplitude modulation (AM) and Frequency modulation?
(b) Why modulation index value is kept below unity? Explain with necessary diagram
(c) Compare FDM and TDM.

4 + 6 + 6 = 16

2. (a) Compare AM and FM based on the following metrics:
bandwidth, SNR, efficiency.
(b) Describe generation of NBFM with necessary mathematical background for NBFM signal generation.
(c) What is preemphasis and deemphasis?

6 + 6 + 4 = 16

3. (a) Compare PCM and DPCM.
(b) Analog telephone line uses sampling rate of 8kHz. Find the minimum channel bandwidth requirement for the channel performing PCM with 4bit encoding.
(c) A signal band limited to 3 KHz is sampled at a rate of 33.333 % higher than Nyquist rate. Maximum quantization error is 0.5% of peak amplitude mp. The quantized samples are binary coded. Find the minimum bandwidth of a channel required to transmit encoded binary signal. If 24 such signals are time division multiplexed what is the minimum transmission bandwidth?
(d) What is slop overload in delta modulation?

4 + 2 + 6 + 4 = 16

4. (a) What is Manchester coding?
(b) Explain full cosine roll-off factor.
(c) A leased telephone line of bandwidth 3kHz. is used to transmit binary data. Calculate data rate that can be transmitted if we use,
(i) polar signal of half-width pulse
(ii) polar signal of full-width pulse
(d) Describe the functionality of zero-forcing equalizer to reduce ISI.

3 + 4 + 4 + 5 = 16

5. (a) State Shannon's theorem for noisy channel
(b) What is Shannon's limit?