

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2289461

Roll No.

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## B.TECH

Regular Theory Examination (Odd Sem-V), 2016-17

### PRINCIPLES OF COMMUNICATION

*Time : 3 Hours*

*Max. Marks : 100*

#### SECTION - A

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (10×2=20)
- Compare Baseband and Passband signal.
  - How to generate a Television signal.
  - Write down the bandwidth of AM-DSB-FC, AM-DSB-SC-AM-SSB and AM-VSB.
  - Differentiate between frequency and phase modulation.
  - Define Line coding with an example.
  - How to avoid aliasing effect in a sampled signal?
  - Why thermal noise act as an important factor affecting output power in PCM technique.

- h) Calculate the power spectral density of noise in Linear filter.
- i) Mention the uses of a limiter-discriminator in FM Demodulation.
- j) Name and Draw the various artificial spike responses of a PLL.

**SECTION - B**

**Note: Attempt any five parts from this section. (5×10=50)**

- 2. a) Draw a block representation of a Super hertodyne AM receiver, and explain the function of IF amplifier.
- b) Derive the power calculation of AM signal.
- c) Represent a binary data 101010111111110101 using Manchester code. AMI code and Bipolar Rz.
- d) Summarize the sampling process of a signal with mathematical expressions.
- e) How to generate PPM from PWM signal? Explain with proper waveforms.
- f) Design a FM modulation system, whose  $f_c = 96\text{MHz}$ ,  $\Delta f = 75\text{kHz}$  to broadcast an audio signal of frequency  $f_m = 50\text{Hz}$ . Using Amstrong's Indirect method.

- g) Write a technical note on TDM for T1 system, with the help of a neat diagram.
- h) Show the response of baseband signal for delta and adaptive delta modulation.

**SECTION - C**

**Note: Attempt any two Questions from this section.**

**(2×15=30)**

- 3. Explain the concept AM-SSB modulation and demodulation with the help of neat diagram and mathematical analysis for coherent detection.
- 4. Describe the sampling techniques and signal recovery through holding used in PAM
- 5. a) Derive the spectral components of Noise. (5)
- b) Illustrate the uses of PLL in the digital data transmission. (10)

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