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B.TECH
(SEM VII) THEORY EXAMINATION 2017-18
ANALOG & DIGITAL COMMUNICATION

*Time: 3 Hours**Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

2. Any special paper specific instruction.

SECTION A

1. Attempt all questions in brief. 2 x10 = 20

- a. What is the envelope of AM wave?
- b. Define modulation Index for AM wave in AM system?
- c. What is percent modulation for an FM?
- d. What is Carson's rule?
- e. What is sampling theorem?
- f. What do you mean by Nyquist rate?
- g. Explain the advantages of TDM.
- h. Define entropy of a source.
- i. Give a comment on channel capacity.
- j. Draw the various waveforms for amplitude, frequency and phase shift keying.

SECTION B

2. Attempt any three of the following: 10 x 3 = 30

- a. Explain Ring modulator for the DSB-SC Generation.
- b. Write short notes on Delta and adaptive delta modulation.
- c. A signal having bandwidth equal to 3.5 khz is sampled, quantized and coded by a PCM system. The coded signal is then transmitted over a transmission channel of supporting a transmission rate of 50k bits/sec. determine the maximum signal to noise ratio that can be obtained by this system. The input signal has peak to peak value of 4 volts and rms value of 0.2V.
- d. Define the method of generation of ASK signals.
- e. Write short note on Performance comparison of frequency modulation and amplitude modulation.

SECTION C

3. Attempt any one part of the following: 10 x 1 = 10

- (a) Evaluate the condition for distortion less demodulation of a VSB signal, initially generated by passing a DSB signal through a vestigial filter, using synchronous detector.
- (b) A given AM broadcast station transmits a total power of 50kW when the carrier is modulated by a sinusoidal signal with a modulation index of 0.707. Calculate the carrier power and the transmission efficiency.

4. Attempt any one part of the following: 10 x 1 = 10

- (a) Show the generation of narrow band FM using phase modulator.
- (b) Write short note on foster seeley discriminator.

- 5. Attempt any *one* part of the following: **10 x 1 = 10****
- (a) Explain working principle of Quantizer.
 - (b) Compare Narrow band FM versus wideband FM.
- 6. Attempt any *one* part of the following: **10 x 1 = 10****
- (a) Explain working operation of the T-1 carrier system with block diagram.
 - (b) Define and draw the TDM system.
- 7. Attempt any *one* part of the following: **10 x 1 = 10****
- (a) Write short note on Shannon fano coding.
 - (b) A memory less source emits six messages with probabilities 0.3, 0.25, 0.15, 0.12, 0.1 and 0.08 find the 4-ary Huffman code. Determine its average word length, the efficiency, and the redundancy.