Printed pages: 02 **Roll No.** | | | | | | | | | | | **Sub Code: NEC-702A**

Paper ID: 3079

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 trough 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 Shannan 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.