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Paper Id: 190056 Roll No:

B.TECH
(SEM VII) THEORY EXAMINATION 2018-19
ANALOG AND DIGITAL COMMUNICATION

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

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

SECTION A

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

a) Draw the Basic block diagram of analog communication system.
b) Explain the advantage of SSB-SC over DSB-SC.
c) Explain transmission bandwidth of FM signals.
d) Define angle modulation.
e) Describe quantization noise.
f) What are Waveform coding Techniques?
g) Compare digital modulation and pulse modulation.
h) Explain coherent and non-coherent methods.
i) State and explain the Hartley Shannan law.
j) Explain bit interleaving.

SECTION B

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

a) Describe the elements of communication system and describe its limitations, features, applications and advantages.
b) Define and explain signal to noise ratio. Describe methods to calculate Noise in AM and FM systems.
c) Explain and differentiate between PAM & PCM systems. Compare their advantages over other.
d) Compare and describe the digital modulation techniques of ASK, FSK and PSK.
e) Describe the Basics of Information Theory. Explain how information is measured. Describe Entropy, channel capacity & Information rate.

SECTION C

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

a) Explain the functioning of a super hetrodyne receiver. Describe IF amplifiers and its applications.
b) Describe Frequency Division multiplexing. Explain Amplitude modulation and describe its detection process.

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

a) Explain Narrow band and wideband frequency modulation. Explain the working of a Frequency Division Multiplexed System (FDM).
b) Explain the Generation and detection of frequency modulation Noise. Explain different type of internal and external noises.

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

a) Explain the functioning of modulation and demodulation. Describe Quardrature Amplitude Modulation (QAM).

b) Draw and explain the block diagram of Differential Pulse code Modulation with transmitter and receiver.

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

a) Explain with the help of block diagram, the working of Delta modulation. Explain How Adaptive Delta modulator improves the performance of Delta modulator.

b) Explain the need of digital modulation. Describe the types of digital modulation. Draw and explain the waveforms for amplitude, frequency and phase shift keying methods.

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

a) Describe the fundamental concepts of Time Division Multiplexing. Explain the functioning of TI carrier system.

b) Determine the Huffman code for the following message with their probabilities given. Also calculate the entropy, redundancy and efficiency of the codes generated.

X:	*x1*	*x2*	*x3*	*x5*	*x6*	*x7*
P:	*0.04*	*0.25*	*0.05*	*0.1*	*0.3*	*0.2*

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