

**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 x 10 = 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.

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

- a) Explain the functioning of modulation and demodulation. Describe Quadrature 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 TDM 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.

$X:$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_6$	$x_7$
$P:$	0.04	0.25	0.05	0.1	0.3	0.2	