

B.TECH
(SEM V) THEORY EXAMINATION 2022-23
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 block diagram of communication channel.
- (b) Define modulation index in Amplitude modulation wave.
- (c) How noise effect on the Amplitude modulation (AM) wave?
- (d) Define bandwidth in Angle modulated signal.
- (e) Explain the nyquist criteria for sampling.
- (f) Write the advantages of pulse amplitude modulation
- (g) Explain the types of digital modulation technique.
- (h) Explain bit rate and bandwidth of FSK
- (i) Write the advantages of time division multiplexing.
- (j) Define entropy in information theory

SECTION B

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

- (a) Briefly explain about the Super-heterodyne receiver and its advantages.
- (b) What is frequency modulation? Explain mathematical representation of frequency modulation.
- (c) Explain generation and detection methods of pulse amplitude modulation.
- (d) Draw the block diagram of BPSK transmitter. Explain balanced ring modulator of BPSK.
- (e) Give brief introduction about time division multiplexing? Explain synchronous and asynchronous TDM.

SECTION C

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

- (a) With the help of diagram explain generation and detection of SSB-SC wave.
- (b) What is the basic concept of multiplexing? Explain frequency division multiplexing (FDM) hierarchy system.

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

- (a) Explain the generation of FM wave using indirect method and slop detectorfor demodulation.
- (b) Drive the mathematical expression of wide band frequency modulation using Bessel function.

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

- (a) What is delta modulation? Explain working of adaptive delta modulation with proper block diagram
- (b) Explain the generation and demodulation of pulse width modulation (PWM)?

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

- (a) Explain briefly about the transmitter and receiver of FSK with neat and clean diagram.
- (b) Discuss about the 8-bit QAM transmitter. For an 8bit-PSK system, operating with an information bit rate of 24kbps, determine (a) baud, (b) minimum bandwidth, and (c) bandwidth efficiency

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

- (a) What should be the desirable feature of a T1 carrier system? Explain PCM-TDM system.
- (b) Design a binary Huffman code for a discrete source having seven independent symbols having probabilities 0.25, 0.25, 0.125, 0.125, 0.125, 0.0625 and 0.0625 respectively. Also, calculate the efficiency of this code.

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