

Printed pages: 02

Sub Code: EEC-502

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B.TECH
(SEM V) THEORY EXAMINATION 2017-18
PRINCIPLES OF 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. Why we need of modulation?
 - b. What are the differences between DSB-SC and SSB-SC?
 - c. What is Carson's rule?
 - d. What are the drawbacks of narrowband FM?
 - e. What is FDM?
 - f. Write the differences between PWM and PPM.
 - g. Define granular noise.
 - h. What do you understand by ADM?
 - i. Explain PLL.
 - j. Explain the threshold effect in FM.

SECTION B

- 2. Attempt any three of the following: 10 x 3 = 30**
- a. Explain the generation and detection techniques of SSB-SC signal. What are the advantages and disadvantages of SSB-SC scheme?
 - b. Draw the block diagram of a stereophonic broadcasting transmitter and receiver system.
 - c. Explain the process of quantization in PCM system. 24 telephone channels, each band limited to 3.4 KHz, are to be time division multiplexed by using PCM. Calculate the bandwidth of PCM system for 128 quantization levels and an 8 KHz sampling frequency.
 - d. Explain voice coders. Also explain the various types of noise in a communication system.
 - e. Draw and explain the pre-emphasis and de-emphasis circuit in FM.

SECTION C

- 3. Attempt any one part of the following: 10 x 1 = 10**
- (a) Draw the block diagram of a super heterodyne receiver and explain the function of each block.
 - (b) An AM amplifier has a radio frequency output of 50W at 100% modulation. The internal loss in the modulator is 10W.
 - (i) What is the un modulated carrier power?
 - (ii) What power output is required from the modulator?
 - (iii) If the percentage modulation is reduced to 75% how much output is needed from the modulator?

- 4. Attempt any *one* part of the following: **10 x 1 = 10****
- (a) Draw and explain the circuit of an FM slope detector . What are the limitations of this circuit.
- (b) Explain the Armstrong method for generation of wide band FM. Write the differences between AM and FM.
- 5. Attempt any *one* part of the following: **10 x 1 = 10****
- (a) State and prove sampling theorem in time domain. What are the differences between natural sampling and flat topped sampling?
- (b) Explain the generation and detection method of a PPM signal.
- 6. Attempt any *one* part of the following: **10 x 1 = 10****
- (a) Describe delta modulation systems. What are its limitations? How can they be overcome?
- (b) Explain the synchronous and asynchronous time division multiplexing of PCM signals.
- 7. Attempt any *one* part of the following: **10 x 1 = 10****
- (a) Define figure of a merit of a communication system. Derive an expression for the figure of merit for a FM system.
- (b) Draw and explain the block diagram of a digital phase locked loop system. Write the differences between analog PLL and digital PLL.