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(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 121601 Roll No. | | | | | | | | | | |

B.TECH.

Theory Examination (Semester-VI) 2015-16

ANALOG & DIGITAL COMMUNICATION

Time : 3 Hours ***Max. Marks : 100***

Note: - Attempt all the questions. Each question carries equal marks.

1. Attempt all parts of this Section: (2×10=20)

(a) What is Modulation?

(b) Explain capture effect in FM receivers.

(c) What is noise? Noise is difficult to eliminate but its effect can be minimize, justify.

(d) Define Channel Capacity.

(e) What is Entropy? How is it useful in determining information ?

(f) List the Spread Spectrum Techniques.

(g) Explain VSB modulation method.

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(h) What is Radio transmitter? What are different blocks used in the transmission of radio signal?

(i) Define Inter Symbol Interference (ISI).

(j) What is Shanon Limit for Information Capacity?

2. Attempt any five parts of the following: (10×5=50)

(a) What is sampling theorem? What is the relevance of Discrete Fourier Transform in relation to Nyquist criterion?

(b) What is pulse code modulation ? Using suitable diagram explain the quantization of signals.

(c) Draw and Explain the block Diagram of TDM system. Also list the basic problems involved in design of a digital Multiplexer?

(d) Write a short note on Shannon-Fano Coding.

(e) Explain the working of Delta modulation. How does Adaptive Delta Modulation improve the performance of Delta Modulation?

(f) Find the carrier and modulating frequencies,the modulation index and the maximum deviation of the F.M. wave represented by the voltage equation $V = 12 \sin (6 \times 10^8 t + 5 \sin 1250 t)$. What power will this F.M. wave dissipate in a 10 Ω resistor?

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(g) Evaluate the auto correlation and cross correlation function of in phase and quadrature components of the narrowband noise at the coherent detector input for

(i) The DSB-SG system

(ii) The SSB system for Lower Side Bands

Attempt any two parts of the following: (15×2=30)

3. An AM amplifier provides an output of 106 W at 100 % modulation. The internal loss is 20 W :

(i) What is un-modulated carrier power?

(ii) What is the side band power ?

4. The function given below represents which type of signal ?

$f(t) = \cos(w_c t) + 0.3 \cos(2\pi f_m t) \sin(2\pi f_m t)$.

Sketch its phasor diagram at $t = 0$.

5. Draw the block diagram of an SSB-SC transmitter employing sideband suppression filter and explain.

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