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B. TECH.

THEORY EXAMINATION (SEM–VI) 2016-17

COMMUNICATION ENGINEERING

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

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION-A

1 Explain the following: **(10×2=20)**

a) Communication Process
b) Modulation Process
c) Nonlinear Effects in FM Systems
d) White Noise
e) The Sampling Process
f) Probability Of Error Dueto Noise
g) Band-Pass Transmission Model
h) Uncertainty
i) Channel Capacity
j) Lossless Data Compression

SECTION-B

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

a. Describe an expression for the effective modulation index of a multi-tone modulated AM signal.

b. What is quantization? How can you minimize the quantization error? How quantizing and coding is done? Explain with suitable waveform.

c. Analyze noises present in amplitude modulation system and derive its signal to noise ratio. Find out the figure of merit in DSB-SC system.

d. What is pre-emphasis and de-emphasis and how SNR improves by using pre-emphasis and de-emphasis? Find out the figure of merit in SSB-SC system.

e. What is digital phase locked loop? Explain the working of an Ex-OR gate based digital phase comparator. Define Frequency Division Multiplexing and Time Division Multiplexing. Define concept of bandwidth and frequency spectrum?

f. Explain the functioning of a FSK digital transmitter cum receiver operation in detail with the relevant diagrams.

g. Explain with suitable diagram the operation of Super heterodyne receiver and compare its performance with Tunal Radio frequency receiver.

h. What do you mean by power spectral densities? Explain Noise in AM receivers and FM Receivers with suitable diagram.

SECTION-C

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

3. What do you understand by instantaneous frequency, frequency deviation and bandwidth of FM wave? A carrier wave of frequency 100 MHz is frequency modulated by a sinusoidal wave of amplitude 20V and frequency 100 kHz. The frequency sensitivity of the modulator is 25 kHz per volt. Determine approximate bandwidth of FM signal.

4. a. Explain the functioning of a ASK and PSK digital transmitter cum receiver operation.
b. Why QPSK is better than PSK? Explain with suitable examples.

5. Write short note with suitable diagram and example:

a. OFDM& Source Coding Theorem
b. PPM & TDM
c. ISI & Eye Pattern