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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)**

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

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

- Describe an expression for the effective modulation index of a multi-tone modulated AM signal.
- What is quantization? How can you minimize the quantization error? How quantizing and coding is done? Explain with suitable waveform.
- Analyze noises present in amplitude modulation system and derive its signal to noise ratio. Find out the figure of merit in DSB-SC system.
- 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.
- 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?
- Explain the functioning of a FSK digital transmitter cum receiver operation in detail with the relevant diagrams.
- Explain with suitable diagram the operation of Super heterodyne receiver and compare its performance with Tuned Radio frequency receiver.
- 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)**

- 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.
- Explain the functioning of a ASK and PSK digital transmitter cum receiver operation.
 - Why QPSK is better than PSK? Explain with suitable examples.
- Write short note with suitable diagram and example:
 - OFDM & Source Coding Theorem
 - PPM & TDM
 - ISI & Eye Pattern