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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -3 EXAMINATION- May 2018
B.Tech IV Semester (ECE)

COURSE CODE: 17B11EC412 MAX. MARKS: 35
COURSE NAME: Analogue and Digital Communications
COURSE CREDITS: 4 MAX. TIME: 2 Hr.

Note: *All questions are compulsory. Carrying of a mobile phone during examinations will be treated as a case of unfair means.*

Q1) Explain the principle of quantization and obtain the expression for the signal to quantization noise ratio. Design a digital communication system using PCM system, so as to achieve a signal to quantization noise ratio of at least 40 dB for an analog signal of $S(t) = 3\cos(1000\pi t)$. [CO-4] [5]

Q2) Discuss the merits and demerits of digital communication and give a functional description of digital communication systems. [CO-5] [5]

Q3) What are design features are required for digital modulation? Explain the working of BSK modulator and demodulator with suitable diagrams. [CO-6] [5]

Q4) Discuss the effect of noise on received SNR in conventional AM and compare it with baseband system. [CO-3] [5]

Q5) Explain the working of DPCM transmitter and receiver and compare its performance with PCM. [CO-4] [5]

Q6) Why pre-emphasis and de-emphasis are required in FM system? Discuss in detail with suitable diagram. An FM wave is given by $S(t) = 20\cos\left(8\pi 10^6 t + 9\sin\left(2\pi 10^3 t\right)\right)$. Calculate the frequency deviation, bandwidth, and power of FM wave. [CO-2] [5]

Q7) What is Hilbert transform? A sinusoidal modulating waveform of amplitude 5 V and a frequency of 2 KHz is applied to FM generator, which has a frequency sensitivity (k_f) of 40 Hz/volt. Calculate the frequency deviation, modulation index, and bandwidth. [CO-1] [5]