

PDC(EC-2004) Assignment-1

All Questions are compulsory, carries equal marks and the total marks will be normalized to 5

1. Define Energy Signal and Power signal, List the characteristics of analog signal and digital signal. CO1
2. Draw the basic block diagram of a communication system. Explain four basic needs for modulation. CO2
3. Find the Fourier Transform of unit step signal $u(t)$, $\text{sgn}(t)$ also plot them graphically in both Time and Frequency domain. CO1
4. A carrier signal $C(t)=20 \cos(2\pi * 10^6 t)$ is modulated by message signal having frequency 5kHz with a modulation index of 0.4. Sketch the spectrum and calculate the efficiency, side band power and total power of (DSB - FC) AM transmission. CO2
5. Two signals $a(t)=10\cos(100\pi t)$ and $b(t)=15\cos(5000\pi t)$ are applied to a non-linear device to generate an AM signal with output $y(t)=3 + 2v + 4v^2$. Find expression of the AM signal, calculate its modulation index, bandwidth and draw its spectral response. CO2
6. What is Quadrature Null effect. Explain where it will occur with proper block diagram, mathematical expressions. CO2

All the very Best