PCS-Question Bank

	UNIT – I
1.	Define modulation? Explain different types of modulation with relevant mathematical expression. What are the advantages of modulation?
2	Derive the expression of Amplitude Modulation for a modulating signal m (t) both in time domain and frequency domain with necessary waveforms and magnitude spectrum.
3	Explain generation of AM wave using Switching Modulator giving relevant mathematical equations.
4.	Show that an AM wave can be generated using a nonlinear device (NLD) whose output is proportional to square of the input. Draw the spectrum at the output of NLD and provide design specification of band pass filter to extract desired AM wave
5	Sketch the modulated wave that can be obtained by the multiplication of carrier wave and message signal. Compare this signal with standard AM signal both in time and frequency. And also show that this modulated wave can be obtained by using standard amplitude modulators with neat block diagram.
6	An audio frequency signal $10\cos 2\pi(500t)$ is used to amplitude modulate a carrier of $50\cos 2\pi(10^6 t)$. Assume modulation index 0.5. Calculate the following (i) side band frequencies (ii) Amplitude of each side band (iii) Bandwidth required (iv) Power of each component and Total power delivered (v) Draw the spectrum of AM wave. + All numericals.
7	Derive the expression for detection/demodulation of AM wave using square-law demodulator along with relevant diagram and waveforms.
8.	Analyze the working of a diode circuit for generating a modulated wave with only two sidebands. Draw the spectrum and provide design specification of band pass filter to extract desired modulated wave.
9	With a neat diagram and waveforms, explain the generation of Single and/or Multi Tone AM signal using a switching / NLD modulator and derive the necessary equation.
10.	Explain how ring modulator can be used to generate DSBSC wave ? With circuit & waveforms and necessary expressions

11	Derive the expression demodulation of AM wave using envelop detector along with relevant diagram and waveforms.
12	All numerical.
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