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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Electronics and Instrumentation Engineering **Duration: 3 hrs.**
Course Code: 19EI5PCCST **Max Marks: 100**
Course: Communication Systems **Date: 22.09.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1	a)	Describe the generation and detection of AM wave using switching modulator and envelope detector.	**10**
	b)	The antenna current of an AM transmitter is 8A when only the carrier is sent, but it increases to 8.93A when the carrier is modulated by a single sine wave, find the % modulation. Determine the antenna current when the depth of modulation change to 0.8.	**04**
	c)	Describe the reconstruction of DSB-SC signal using Costas receiver.	**06**

OR

2	a)	With proper circuit diagram explain how ring modulator can be used to generate the DSB-SC signal and write the relevant waveform.	**10**
	b)	An audio frequency signal $10\sin(2\pi(500)t)$ is used to amplitude modulate a carrier of $50\sin(2\pi(10^5)t)$. Assume modulation index is 0.2, find side band frequencies and bandwidth required.	**04**
	c)	Explain the working principle of Quadrature carrier multiplexing and de-multiplexing.	**06**

UNIT - II

3	a)	With relevant diagram explain implementation of FM by PM and PM by FM.	**06**
	b)	Explain the balanced slope detector system in demodulation of FM wave.	**06**
	c)	Show that WBFM has infinite number of side bands with mathematical equations.	**08**

UNIT - III

4	a)	Derive the figure of merit for an AM receiver with envelope detector and show that FOM is equal to $\frac{\mu^2}{2+\mu^2}$	**10**

	b)	Compare Pre-emphasis and De-emphasis for improvement in the quality of FM system.	**10**

UNIT - IV

5	a)	Describe the Transmitter and Receiver of delta modulation system and explain slope overload distortion and granular noise.	**10**
	b)	With mathematical equation and waveform compare the natural sampling and flat top sampling.	**06**
	c)	Explain briefly on quantization process in digital communication.	**04**

UNIT - V

6	a)	Describe the generation and coherent detection of Binary Phase Shift Keying (BPSK) signals.	**10**
	b)	Explain the Transmitter of BFSK signal.	**04**
	c)	With relevant diagram discuss the concept of Time Division Multiple Access (TDMA) technique	**06**

OR

7	a)	With the help of neat block diagram and relevant waveform explain the generation and detection of QPSK signals.	**10**
	b)	Illustrate the use of amplitude modulation for batch pH control in a process control systems.	**04**
	c)	Discuss Frequency Division Multiple Access (FDMA) technique.	**06**

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