CLASS: BTECH   SEMESTER : V
BRANCH: EEE   SESSION : MO/2023

SUBJECT: EE417 FUNDAMENTAL OF COMMUNICATION SYSTEM

TIME: 3 Hours   FULL MARKS: 50

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Derive time convolution theorem property of Fourier transform.	[5]	1	3
Q.1(b)	Explain the digital communication system. State the properties of Energy Spectral density.	[3+2]	1	1
Q.2(a)	Explain the working of Ring Modulator.	[5]	2	2
Q.2(b)	For a broadcast superheterodyne AM receiver having no RF amplifier, the loaded Quality factor Q of the antenna coupling circuit is 100. Now, if the intermediate frequency is 455 KHz, then determine the following : The image frequency and its rejection ratio at an incoming frequency of 1000 KHz.	[5]	2	4
Q.3(a)	Explain frequency modulation. State transmission bandwidth of Frequency Modulation.	[5]	3	1
Q.3(b)	(i) Compare Wideband frequency modulation and Narrowband frequency modulation.	[2+3]	3	1
	(ii) A sinusoidal modulating waveform of amplitude 5V and a frequency of 2kHz is applied to FM generator, which has a frequency sensitivity (K_f) of 440 Hz/volt. Calculate the frequency deviation, modulation index and bandwidth.		3	4
Q.4(a)	An analog signal is expressed by the equation $x(t) = 3 \cos 50\pi t + 10 \sin 300\pi t - \cos 100\pi t$. Calculate the Nyquist rate for this signal	[5]	4	4
Q.4(b)	Explain with diagram a PCM generator	[5]	4	1
Q.5(a)	Explain equivalent noise bandwidth.	[5]	5	1
Q.5(b)	Determine receiver's noise figure in decibels and its equivalent noise temperature. A receiver is connected to an antenna whose resistance is 50Ω. The equivalent noise resistance of this receiver is 30Ω.	[5]	5	4

::::::28/11/2023::::::M