BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO-2022)

CLASS: BTECH **SEMESTER : V**
BRANCH: EEE **SESSION : MO 2022**

SUBJECT: EE417 FUNDAMENTALS OF COMMUNICATION SYSTEM

TIME: 03 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*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

Q.1(a)	Estimate power of a sinusoidal carrier signal $c(t)=A_c\sin(\omega t)$. [CO1, BL3]	[2]
Q.1(b)	Find the Fourier Transform of (i) $\sin(2\pi f_c t)$ and (ii) unit step signal. Sketch the Magnitude spectrum. [CO1, BL3]	[3]
Q.1(c)	Elucidate the elements of a communication system and show the block diagram of a digital communication system. [CO1, BL1]	[5]
Q.2(a)	What is over-modulation? Discuss the condition at which over-modulation occurs. [CO1, BL1]	[2]
Q.2(b)	Explain the working principle of Envelope Detector. [CO2, BL2]	[3]
Q.2(c)	The resultant current of an amplitude-modulated wave is 5A for a carrier current of 3.8A. What will be the percentage change in the modulation index if carrier current increases by 15%. [CO2,BL3]	[5]
Q.3(a)	What is Frequency Division Multiplexing? Draw its block diagram. [CO3,BL2]	[2]
Q.3(b)	State Carson's Rule for Frequency Modulation. Explain the working of Hartley Oscillator. [CO3, BL2]	[3]
Q.3(c)	What is Phase Locked Loop (PLL)? Explain its application in FM demodulation. [CO3,BL2]	[5]
Q.4(a)	Enumerate the advantages of digitizing the analogue sources. What is Aperture Effect? [CO4, BL1]	[2]
Q.4(b)	Compare the performance of amplitude and frequency modulation techniques. [CO3, BL4]	[3]
Q.4(c)	Explain Delta Modulation. What is slope overload? [CO4, BL2]	[5]
Q.5(a)	Define power spectral density (PSD). [CO1, BL1]	[2]
Q.5(b)	Elucidate the properties of PSD and auto-correlation function. [CO5, BL2]	[3]
Q.5(c)	Write short notes on (i) Thermal Noise and (ii) White Noise. [CO5, BL2]	[5]

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