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

CLASS: BTECH **SEMESTER : V**
BRANCH: CSE/EEE **SESSION : MO/2025**

SUBJECT: EC321 INTRODUCTION TO 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 the mathematical expression for the amplitude-modulated (AM) signal using a square law modulator.	[5]	1	2
Q.1(b)	A given AM broadcast station transmits a total power of 8 kW when the carrier is modulated by a sinusoidal signal with a modulation index of 0.7071. Determine carrier power and transmission efficiency.	[5]	1	3
Q.2(a)	Explain the generation of FM using the direct method.	[5]	2	2
Q.2(b)	Draw and explain block diagram of AM superhetrodyne receiver. What do you mean by heterodyning process? How the Radio frequency (RF) signals are converted into intermediate frequency (IF) signals?	[5]	2	2
Q.3(a)	Explain the quantization process in analog-to-digital conversion in detail.	[5]	3	3
Q.3(b)	Discuss the generation and demodulation of pulse width modulation (PWM) with necessary diagrams.	[5]	3	2
Q.4(a)	Explain the generation of M-ary PSK signals with mathematical equations.	[5]	4	2
Q.4(b)	Explain the principle of spread spectrum modulation and discuss its applications in modern communication systems.	[5]	4	2
Q.5(a)	Explain in detail the different types of noise encountered in communication systems.	[5]	5	1
Q.5(b)	State and prove Shannon's channel capacity theorem.	[5]	5	2

::::::26/11/2025::::::M