

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

**CLASS: BTECH
BRANCH: CSE/AI ML/EEE/MECH/CE**

**SEMESTER : V
SESSION : MO/2024**

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.
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Q.1(a)	Explain the generation of DSB-SC signal with suitable block diagram. Write the necessary equations.	[5]	1	2
Q.1(b)	(i) What is meant by modulation and explain the benefits of modulation. (ii) A given AM broadcast station transmits a total power of 5 kW when the carrier is modulated by a sinusoidal signal with a modulation index of 0.7071. Determine carrier power and transmission efficiency.	[2+3]	1	2,3
Q.2 (a)	Explain the generation of FM using the direct method.	[5]	2	2
Q.2 (b)	How is narrowband signal distinguished from wideband signal? What is the need for limiter circuits in FM systems?	[5]	2	2
Q.3 (a)	Define the sampling theorem. Draw the block diagram and explain the process of a PCM system in detail.	[5]	3	1
Q.3 (b)	With block diagram explain the generation of PWM signals. Also draw the waveform of each step of PWM generation.	[5]	3	1
Q.4(a)	(i) Sketch the digitally modulated waveforms for the binary data 1101011 using ASK and FSK. (ii) What is the PN sequence? Write the advantage and disadvantage of Spread spectrum modulation and its application.	[2.5+2.5]	4	2,3
Q.4(b)	Explain the QPSK transmitter with suitable block diagram and state the concepts in your own words with relevant waveforms.	[5]	4	2
Q.5(a)	What do you mean by noise? Explain the difference between thermal noise and shot noise.	[5]	5	2
Q.5(b)	State Shannon's channel capacity theorem. Explain the importance of the S/N ratio in the communication field.	[5]	5	2

:::26/11/2024:::M