

Code: 23EC3502

**III B.Tech - I Semester - Regular Examinations - NOVEMBER 2025**

**DIGITAL COMMUNICATIONS**  
**(ELECTRONICS & COMMUNICATION ENGINEERING)**

**Duration: 3 hours****Max. Marks: 70**

Note: 1. This question paper contains two Parts A and B.  
 2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.  
 3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.  
 4. All parts of Question paper must be answered in one place.

**BL – Blooms Level****CO – Course Outcome****PART – A**

		<b>BL</b>	<b>CO</b>
1.a)	Define sampling and quantization.	L1	CO1
1.b)	Distinguish between PCM and DPCM.	L2	CO1
1.c)	Explain ASK with a neat signal representation.	L2	CO2
1.d)	Write the probability of error expression for FSK.	L1	CO2
1.e)	Define jamming margin in spread spectrum.	L1	CO3
1.f)	Sketch the block diagram of FHSS system.	L3	CO3
1.g)	Define channel capacity.	L1	CO4
1.h)	Explain Shannon-Fano coding briefly.	L2	CO4
1.i)	Write the structure of convolutional code.	L1	CO5
1.j)	Write short notes on Trellis diagram.	L1	CO5

## PART – B

			BL	CO	Max. Marks
<b>UNIT-I</b>					
2	a)	Illustrate the working of DPCM neat block diagram.	L3	CO1	5 M
	b)	Explain about merits and demerits of ADM over DM.	L2	CO1	5 M
<b>OR</b>					
3	a)	Outline the process of quantization in PCM systems.	L2	CO1	5 M
	b)	Summarize about Manchester line coding scheme.	L2	CO1	5 M
<b>UNIT-II</b>					
4	a)	Describe about QPSK modulation and demodulation.	L2	CO2	5 M
	b)	Determine the probability of error for PSK.	L3	CO2	5 M
<b>OR</b>					
5	a)	Explain about M-ary PSK system with a neat diagram.	L2	CO2	5 M
	b)	Distinguish between ASK, FSK, and PSK techniques.	L4	CO2	5 M
<b>UNIT-III</b>					
6	a)	Summarize about DSSS BPSK system.	L2	CO3	5 M
	b)	Summarize the need of Spread spectrum modulation.	L2	CO3	5 M

**OR**

7	a)	Compare the Slow and Fast Frequency Hopping.	L4	CO3	5 M
	b)	Discuss about the Applications of Spread spectrum Techniques.	L2	CO3	5 M

**UNIT-IV**

8	a)	Summarize about entropy and explain its properties.	L2	CO4	5 M
	b)	Explain about mutual information and its significance.	L2	CO4	5 M

**OR**

9	a)	Illustrate Lempel-Ziv coding with an example.	L3	CO4	5 M
	b)	Summarize about channel coding theorem.	L2	CO4	5 M

**UNIT-V**

10	a)	Explain encoder and decoder for cyclic codes with an example.	L2	CO5	5 M
	b)	Write short notes on error detection and correction using block codes.	L2	CO5	5 M

**OR**

11	a)	Illustrate convolutional codes with an example of encoding sequence.	L3	CO5	5 M
	b)	Explain the Viterbi decoding algorithm.	L2	CO5	5 M