

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V EXAMINATION – WINTER 2025****Subject Code:3151104****Date:21-11-2025****Subject Name:Analog and Digital Communication****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS	
Q.1	(a) Compare baseband versus carrier modulation.	03	
	(b) State and prove the sampling theorem.	04	
	(c) Discuss the QPSK modulation scheme in detail.	07	
Q.2	(a) Enlist the classification of signals. Also, define each category.	03	
	(b) Define FM and PM. Establish the relationship between FM and PM.	04	
	(c) What is aliasing? Discuss the factors responsible for aliasing. Also, discuss possible solutions for it.	07	
OR			
Q.3	(c) Present analysis of double sideband amplitude modulation. Also, derive sideband and carrier power.	07	
	(a) Define ISI (inter-symbol interference). Discuss its effects on communication.	03	
	(b) Justify the need for line coding. Enlist various line coding schemes.	04	
Q.3	(c) What is quantization? Narrate its importance. Compare linear versus nonlinear quantization.	07	
	OR		
	Q.3	(a) Define scrambling. What are the needs of scrambling?	03
(b) What is ADPCM? Explain it in brief.		04	
(c) Explain Differential PCM in detail.		07	
Q.4	(a) Show bandwidth analysis of angle-modulated waves.	03	
	(b) Discuss practical issues in Signal Sampling and reconstruction.	04	
	(c) State and prove Nyquist's criteria for zero ISI.	07	
OR			
Q.4	(a) What is the superheterodyne concept?	03	
	(b) What is adaptive delta modulation? Describe it in brief.	04	
	(c) Explain equalizers in detail.	07	
Q.5	(a) What is an eye diagram? What is its usage?	03	
	(b) Discuss the FM broadcasting system.	04	
	(c) Write a short note on delta modulation.	07	
OR			
Q.5	(a) What is a compander? What is its usage?	03	
	(b) Write a short note on the GMSK modulation technique.	04	
	(c) What are preemphasis and deemphasis in FM? Explain them. Justify their needs in FM. Can we use them in AM? Why?	07	
