GPCET

SET NO: 3

G.PULLAIAH COLLEGE OF ENGINEERING AND TECHNOLOGY::KURNOOL

(Autonomous)

II B.Tech II SEM (R23) MID-I Examinations – Feb'2025

Department of Electronics and Communication Engineering

Sub: ADC (A60410) | Date: 3-03-2025

Time: 90 min | Max. Marks: 30

Answer all the Questions (3X10=30M)

		Marks	Unit	CO	Cognitive Level
1	a) With the help of neat block diagram explain the various generation and detection methods of DSBSC b) Determine the percentage power saving when the carrier wave and one of the side bands are suppressed in an DSBSC wave, modulated to a depth of a) 100% b) 50%.	7+3M	I	CO1	Remember & Apply
	(OR)				
2	a) With neat sketch explain the generation and detection of VSB b) Derive the expression for power required to transmit an AM wave with single tone modulation	5+5M	I	CO1	Remember & Apply
3	a) With a neat sketch discuss the drawbacks of Delta modulation and how it can be avoided. b) Derive Figure of merit for DSBSC System.	4+5M	II	CO2	Understand & Analize
	(OR)				
4	a) With the neat sketch of wave forms discuss various Sampling methods. b) Discuss Bandwidth noise trade off.	7+3M	II	CO2	Understand & Apply
5	Compare a) Analog vs Digital communication b) Base band and pass band data transmission	5+5M	I	CO1	Understand & Apply
	(OR)				
6	a) Discuss quantization process b) with the help of neat sketch explain the working of TDM.	5+5M	II	CO2	Remember

Signature of Faculty

Signature of HOD

GPCET

G. PULLAIAH COLLEGE OF ENGINEERING AND TECHNOLOGY: KURNOOL

(Autonomous)

II B. Tech II SEM (R20) MID-II Examinations April-2025

(ECE)

Subject: ADC (A40410) **Date: 30-04-2025**

Time: 1 hour 30 minutes **SET NO: 4** **Max. Marks: 30**

Answer all the Questions

1. a) What is an Eye Pattern? How is it generated and used to evaluate signal quality and detect ISI and timing errors?

Marks: 5M	Unit: III	CO: 3	Cognitive Level: Remember

b) Write short notes on QAM (Quadrature Amplitude Modulation). How does it combine amplitude and phase modulation for bandwidth efficiency?

Marks: 5M	Unit: III	CO: 3	Cognitive Level: Remember

(OR)

2. What is Correlative Level Coding? Explain duobinary and modified duobinary signaling schemes with waveforms and advantages.

Marks: 10M	Unit: III	CO: 3	Cognitive Level: Remember

3. Describe the generation and detection of coherent BPSK signals?

Marks: 10M	Unit: IV	CO: 4	Cognitive Level: Remember

(OR)

4. Describe the generation and detection of coherent BFSK signals.

Marks: 10M	Unit: IV	CO: 4	Cognitive Level: Remember

5. Derive the expression for Shannon Hartley channel capacity theorem.

Marks: 10M	Unit: V	CO: 5	Cognitive Level: Apply

(OR)

6. A black and white television picture frame may be viewed as consisting of approximate $3X10^5$ elements, each of which may occupy one of ten distinct brightness level with equal probability. Assume that rate of transmission is 30 pictures frames/sec and SNR is 30 db. Find the maximum bandwidth required.

Marks: 10M	Unit: V	CO: 5	Cognitive Level: Apply

Signature of the Staff **Signature of HOD**

CODE: A40410 | R23 | H.T.No:

G.PULLAIAH COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

B.Tech II Year II Semester Regular Examinations May 2025

Subject Name: **Analog and Digital Communications**

Branch: **Electronics and Communications Engineering**

Time: 3 Hours | **SET-1** | **Max. Marks: 70**

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10marks

		PART-A			
1	a	Discuss the need for modulation in communication system	2M	CO1	BTL2
	b	Explain narrow band FM and Wide band FM	2M	CO1	BTL6
	c	What is pre-emphasis and De-emphasis in FM	2M	CO2	BTL1
	d	Why do we need to sample an analog signal when converting it to digital	2M	CO2	BTL1
	e	List the properties of Matched filter	2M	CO3	BTL3
	f	What is the significance of EYE PATTERNS in assessing the quality of the signal	2M	CO3	BTL6
	g	What is meant by digital pass band transmission.	2M	CO4	BTL1
	h	How is the energy of a signal represented geometrically	2M	CO4	BTL2
	i	Draw the signal constellation diagram of BPSK and explain it briefly	2M	CO5	BTL1
	j	Explain the basic concept of QAM	2M	CO5	BTL6
		PART-B			
		UNIT-I			
2	a	Obtain the band width and frequency spectrum of AM wave with the help of mathematical equations	5M	CO1	BTL2
	b	Calculate the percentage power saving when the carrier and one of the side bands are suppressed in an AM Wave with modulation index equal to a)1 and b)0.40	5M	CO1	BTL2
		OR			
3	a	What is SSB in AM.Explain ohase shift method of SSB generation.	5M	CO1	BTL2
	b	Draw and explain the block diagram of Super heterodyne receiver.	5M	CO1	BTL2
		UNIT-II			
4	a	Explain the effect of noise on AM systems	5M	CO2	BTL6
	b	Compare the impact of noise on DSB and SSB modulation systems	5M	CO2	BTL2
		OR			
5	a	Draw the block diagram of PCM transmitter and receiver	5M	CO2	BTL6

		and explain.			
	b	State and explain sampling theorem	5M	CO2	BTL2
		UNIT-III			
6	a	Explain the concept of Matched filter.How does it help in maximizing the SNR in communication system	5M	CO3	BTL2
	b	State and explain Nyquist criterion for distortion less transmission.	5M	CO3	BTL4
		OR			
7	a	What is the role of pulse shaping in M array PAM transmission and how does it affect ISI	5M	CO3	BTL2
	b	What are the main types of equalizers used in communication system and how do they differ in their operation	5M	CO3	BTL2
		UNIT-IV			
8	a	Describe the steps involved in the Gram-schmitt proecss	5M	CO4	BTL2
	b	Explain the working principle of correlation receiver.How does it helps in detecting the signals in the presence of noise	5M	CO4	BTL2
		OR			
9	a	What is the relation between the SNR and Probability error in a correlation receiver system	5M	CO5	BTL3
	b	Explain the concept of pass band transmission.How does it differs from base band transmission model	5M	CO5	BTL2
		UNIT-V			
10	a	Draw the block diagram of BPSK generation and detection system.Explain with relevant equations	5M	CO5	BTL2
	b	Draw the signal constellation diagram of QPSK and explain it briefly	5M	CO5	BTL2
		OR			
11	a	Draw the constellation diagram of m-array QAM for M=16	5M	CO5	BTL6
	b	What is mutual information.Explain any two properties of mutual information	5M	CO5	BTL1

GPCET
Pioneering Innovative Education

G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous)

(Approved by AICTE | NAAC Accreditation with 'A' Grade |
Accredited by NBA (CIV, CSE, ECE & EEE) | Affiliated to JNTUA)
Nandikotkur Road, Venkayapalli (V), Kurnool - 518452, Andhra Pradesh

Subject Code	**:**	**A30427**	**Subject Name**	**:**	**Analog and Digital Communication Systems**		
Class/Section	**:**	**ECE**	**Year**	**:**	**II B.Tech**	**Semester**	**:** **II-Sem**

QUESTIONBANK

Name of Faculty: S. Fowzia Sultana **Academic Year: 2024 – 25**

BLOOMS LEVEL					
Remember	**L1**	**Understand**	**L2**	**Apply**	**L3**
Analyze	**L4**	**Evaluate**	**L5**	**Create**	**L6**

2 Marks Questions

Unit No	Q.No	Question	CO Mapped	Bloom's Taxonomy Level	Appeared in Previous Question Papers
Unit 1	1	Define baseband signal.	CO1	L1	Sep2010(Reg), Mid(2021), GPCET- Sep 2019
	2	What is the difference between analog and digital communication?	CO1	L1	June2015(Supply), June 2016(Supply), Mid(2023) GPCET- Mar 2022
	3	State two differences between AM and FM.	CO1	L1	Oct2018(Supply), Mid(2015)
	4	What is the need for modulation?	CO1	L1	Dec2016(Supply), Mid(2022), GPCET- Sep 2019
	5	Define DSB-SC modulation.	CO1	L2	April2011(Reg), June 2016(Supply), GPCET- Sep 2019
	6	What is frequency translation?	CO1	L1	Oct 2015(Supply), Mid(2015)
	7	Define Frequency Division Multiplexing (FDM).	CO1	L1	Dec 2023(Reg), Mid(2015), GPCET- Mar 2022
	8	What is a superheterodyne receiver?	CO1	L1	June 2022(Supply), June 2016(Supply), Mid(2021)

	9	Explain the term "Phase Modulation".	CO1	L2	Dec 2021(Supply), Mid(2015)
	10	What are nonlinear effects in FM?	CO1	L1	April 2021(Supply), Mid(2022)
Unit 2	1	Define noise and mention its types.	CO2	L1	June 2019(Reg), Mid(2018), GPCET- Sep 2019
	2	What is the significance of pre-emphasis in FM?	CO2	L1	
	3	Define quantization in PCM.	CO2	L1	June 2016(Supply), Mid(2018), GPCET- Sep 2019
	4	What is the main difference between PAM and PCM?	CO2	L1	Oct 2015(Reg), Mid(2022)
	5	What is the purpose of de-emphasis?	CO2	L1	Oct 2022(Reg), June 2016(Supply), Mid(2022), GPCET- Sep 2019
	6	Name any two sources of noise in communication systems.	CO2	L1	June 2019(Supply), June 2016(Supply), Mid(2023)
	7	What is the bandwidth requirement for PAM signals?	CO2	L2	Oct 2020(Reg), Mid(2019), GPCET- Mar 2022
	8	Define the sampling theorem.	CO2	L1	June 2023(Reg), Mid(2014)
	9	What is DPCM?	CO2	L1	April 2013(Supply), Mid(2015)
	10	What is the major drawback of Delta Modulation?	CO2	L1	June 2018(Reg), June 2016(Supply), Mid(2023)
Unit 3	1	What is a matched filter?	CO3	L1	June 2019(Reg), Mid(2018), GPCET- Sep 2019
	2	List two applications for eye pattern.	CO3	L1	April 2024(Supply), June 2016(Supply), Mid(2019), GPCET- Mar 2022
	3	What are eye pattern?	CO3	L1	June 2016(Supply), Mid(2018), GPCET- Sep 2019
	4	Discuss the performance of data	CO3	L1	Oct 2015(Reg), Mid(2022)

		transmission system using eye pattern technique?			
	5	Discuss the need of optimum transmitting and receiving filter in baseband data transmission	CO3	L1	Oct 2022(Reg), June 2016(Supply), Mid(2022), GPCET- Sep 2019
	6	What is the value of maximum signal to noise ratio of the matched filter? When it becomes maximum?	CO3	L2	June 2019(Supply), June 2016(Supply), Mid(2023)
	7	Construct the block diagram of Base band System.	CO3	L2	Oct 2020(Reg), Mid(2019), GPCET- Mar 2022
	8	Explain about ISI.	CO3	L1	June 2023(Reg), Mid(2014)
	9	What does the width of the eye define?	CO3	L1	April 2013(Supply), Mid(2015)
	10	Make use of the eye pattern and how the sensitivity on the system can be determined?	CO3	L1	June 2018(Reg), June 2016(Supply), Mid(2023)
Unit 4	1	What is meant by orthogonalization?.	CO4	L1	Oct 2021(Reg), Mid(2013), GPCET- Mar 2022
	2	What is error probabilty?	CO4	L1	June 2023(Supply), Mid(2019)
	3	What is sigal space representation?	CO4	L1	June 2023(Reg), Mid(2022)
	4	What is correlator?	CO4	L1	Dec 2021(Supply), Mid(2023), GPCET- Mar 2022
	5	What is the difference between correlator and matched filter?	CO4	L1	Dec 2015(Reg), June 2016(Supply), June 2020(Supply), Mid(2023), GPCET- Mar 2022
	6	How does a signal constellation diagram help in visualizing signal modulation schemes?	CO4	L1	June 2020(Supply), June 2016(Supply), Mid(2015)
	7	Why is the matched filter receiver considered optimal for detecting signals in noise?	CO4	L1	Oct 2023(Reg), June 2020(Supply), Mid(2015), GPCET- Mar 2022
	8	Why is Gram-Schmidt orthogonalization used in signal processing?	CO4	L1	Dec 2013(Reg), June 2020(Supply), Mid(2018), GPCET- Mar 2022
	9	How are signals represented geometrically?	CO4	L1	June 2018(Supply), June 2016(Supply), Mid(2017)

	10	What is the purpose of signal representation in communication systems?	CO4	L2	Dec 2019(Supply), June 2020(Supply), Mid(2016)
Unit 5	1	Explain the Bandwidth, power and energy calculations for PSK signal.	CO5	L1	June 2019(Reg), June 2016(Supply), Mid(2022), GPCET-Mar 2022
	2	Explain why PSK is always preferable over ASK in coherent detection?	CO5	L1	Oct 2016(Reg), June 2016(Supply), Mid(2019)
	3	Distinguish between Coherent and Non coherent detection?	CO5	L1	June 2017(Reg), June 2016(Supply), June 2020(Supply), Mid(2021)
	4	Explain Phase shift keying with relevant equations and waveforms.	CO5	L1	Oct 2022(Supply), Mid(2022), GPCET-Mar 2022
	5	Estimate the band width required for frequency shift keying and draw its spectrum.	CO5	L1	Dec 2021(Supply), Mid(2022)
	6	Explain non coherent detection of Amplitude shift keying.	CO5	L1	June 2022(Supply), June 2016(Supply), Mid(2021), GPCET-Mar 2022
	7	Construct the constellation diagram for Quadrature phase shift keying.	CO5	L1	Dec 2024(Reg), June 2020(Supply), Mid(2020)
	8	Explain coherent detection of frequency shift keying what should be the relationship between bit rate and frequency shift for a better performance?	CO5	L1	Oct 2021(Supply), June 2016(Supply), Mid(2016)
	9	Construct the FSK waveforms for a given input data "1101".	CO5	L2	June 2023(Supply), Mid(2020)
	10	Construct the constellation diagram for phase shift keying.	CO5	L1	Dec 2021(Supply), June 2016(Supply), Mid(2020)

5 Marks Questions

Unit No	Q.No	Question	COs	Bloom's Taxonomy Level	Appeared in Previous Question Papers

Unit 1	1	Explain the basic communication process with a neat block diagram.	CO1	L2	June 2013(Reg), Mid(2021)
	2	Compare baseband and passband transmission with suitable examples.	CO1	L2	Oct 2022(Reg), Mid(2021)
	3	Differentiate between DSB, SSB, and VSB modulation techniques.	CO1	L2	June 2015(Supply), Mid(2022), June 2020(Supply)
	4	Describe frequency translation with a block diagram.	CO1	L2	2018(Reg), GPCET- Mar 2022
	5	Explain the working principle of a Phase Locked Loop (PLL).	CO1	L2	Oct 2016(Reg), June 2020(Supply), Mid(2009)
	6	Discuss the differences between analog and digital communication systems.	CO1	L2	June 2018(Reg)
	7	Explain how FDM works. Mention any two applications.	CO1	L2	Oct 2014(Reg)
	8	Describe the need for modulation in communication systems.	CO1	L2	Dec 2023(Supply), Mid(2019)
	9	Write short notes on the types of angle modulation.	CO1	L2	April 2024(Supply), GPCET- Mar 2022

	10	Explain the concept and importance of bandwidth in AM and FM.	CO1	L2	June 2022(Reg), GPCET- Mar 2022
Unit 2	1	Explain the effects of noise in AM receivers.	CO2	L2	GPCET Apr-2021
	2	Describe the sampling process with a suitable diagram.	CO2	L2	
	3	Compare nd PCM modulation techniques.	CO2	L2	JNTUH 2019
	4	Explain how pre-emphasis and de-emphasis improve FM signal quality.	CO2	L2	GPCET Dec 2023
	5	Discuss the noise performance of DSB and SSB receivers.	CO2	L2	JNTUA Oct/Nov 2019
	6	Briefly explain the quantization process and quantization error.	CO2	L3	GPCET Apr-2021
	7	Describe the role of TDM in digital communication.	CO2	L2	JNTUH 2019
	8	Write short notes on delta modulation with a simple block diagram.	CO2	L2	GPCET Mar-2023
	9	Compare DPCM and PCM.	CO2	L2	GPCET Dec 2023
	10	Discuss the bandwidth-noise tradeoff in pulse modulation systems.	CO2	L3	JNTUA Oct/Nov 2019
Unit 3	1	Explain Pulse Shaping for Optimum Transmission	CO3	L2	Dec 2023(Supply), June 2020(Supply), Mid(2022)
	2	Explain Baseband Signal Receiver.	CO3	L2	June 2024(Reg), Mid(2022)
	3	. Explain Optimum Receiver	CO3	L3	June2022(Reg), Mid(2023)
	4	With Neat diagram, explain Eye Diagrams	CO3	L3	April 2019(Supply), Mid(2023)
	5	Explain the base band transmission of M-ary data with suitable diagrams.	CO3	L2	April 2014(Suppl

					y), Mid(2021)
	6	What is matched filter? Derive the expression for its output SNR.	CO3	L3	Sep2022(Supply), June 2020(Supply), Mid(2007), GPCET-Sep 2019, GPCET-Mar 2022
	7	a) What is an inter symbol interference in baseband binary PAM system? Explain. b) Give the basic components of a filter in baseband data transmission and explain.	CO3	L2	June 2018(Reg), Mid(2021), GPCET-Mar 2022
	8	Solve that the maximum output signal to noise ratio of a matched filter is (SNR) = 2E/N0	CO3	L2	April 2013(Supply), Mid(2021)
	9	Derive the expression for the probability of error of matched filter	CO3	L2	June 2019(Reg), Mid(2015), GPCET-Sep 2019
	10	What is an inter symbol interference in baseband binary PAM system? Explain.	CO3	L3	April 2022(Supply), June 2020(Supply), GPCET-Mar 2022
Unit 4	1	Discuss Gram-schmidt orthogonalization procedure	CO4	L2	Oct 2022(Reg), Mid(2017)
	2	Explain Gram-schmidt orthogonalization procedure	CO4	L2	Oct 2021(Reg), June 2020(Supply), Mid(2022),
	3	Explain geometric representation of signals	CO4	L2	June 2023(Reg), Mid(2018)

	4	Explain the conversion of continuous AWGN channel into a vector channel	CO4	L3	June 2024(Supply), Mid(2019)
	5	Explain correlation receivers	CO4	L3	Oct 2016(Reg), Mid(2022)
	6	Explain probability of error	CO4	L2	Sep2018(Reg), Mid(2022)
	7	Explain the equivalence of correlation and matched filter receivers	CO4	L2	Oct 2022(Reg), Mid(2021), GPCET-Mar 2022
	8	Explain the importance of signal representation in the context of communication systems and how it affects system design and performance.	CO4	L2	Oct 2016(Reg), Mid(2019)
	9	Explain how geometric representation of signals aids in the analysis and design of communication systems.	CO4	L2	June 2018(Supply), Mid(2019), June 2020(Supply)
	10	Explain the Gram-Schmidt orthogonalization process with a step-by-step example using two non-orthogonal vectors.	CO4	L2	April 2024(Reg),
Unit 5	1	Explain in detail about i. i)FSK ii. ii)PSK with waveforms and equations	CO5	L2	April 2018(Reg), June 2020(Supply), Mid(2018)
	2	Determine probability of error for a) ASK and b) PSK systems.	CO5	L2	Sep2022(Reg)
	3	a) Explain the demodulation of FSK using coherent detection. b) Draw the block diagram of QPSK receiver.	CO5	L2	June 2023(Supply)
	4	Explain the generation of PSK signals.	CO5	L2	April 2021(Reg)
	5	a) Discuss QPSK signaling. b) Derive the bit error probability due to PSK receiver.	CO5	L2	Dec 2022(Supply), Mid(2004)

	6	Explain Differential phase shift keying modulation with neat block diagram. Draw the wave forms.	CO5	L2	June 2021(Reg), June 2020(Supply), Mid(2004)
	7	Show that the probability of error for phase shift keying is Pe= Q(2Sav Tb/ N0)1/2 and the threshold level is zero.	CO5	L2	Oct 2019(Reg)
	8	The bit stream 11011100101 is to be transmitted using DPSK. Determine the encoded sequence and the transmitted phase sequence	CO5	L2	June 2018(Reg)
	9	Explain the working of DPSK modulator and demodulator.	CO5	L2	Oct 2019(Reg), June 2020(Supply), Mid(2014), GPCET-Mar 2022
	10	Explain Frequency shift keying modulation with neat block diagram. Draw the wave forms.	CO5	L3	June 2022(Supply)

10 Marks Questions

Unit No	Q. No	Question	COs	Bloom's Taxonomy Level	Appeared in Previous Question Papers
Unit 1	1	With a neat block diagram, explain the amplitude modulation process. Derive the expression for an AM wave.	CO1	L3	June 2013(Reg), Mid(2021)
	2	Compare DSB, SSB, and VSB techniques in detail. Mention their advantages and disadvantages.	CO1	L3	Oct 2022(Reg), Mid(2021)
	3	Explain the working of a superheterodyne receiver with a neat block diagram. Why is it preferred over other receivers?	CO1	L4	June 2015(Suppl

					y), Mid(2022), June 2020(Supply)
	4	Describe in detail the operation of a Frequency Modulator. Include mathematical representation and frequency spectrum.	CO1	L2	2018(Reg), GPCET- Mar 2022
	5	Explain PLL (Phase Locked Loop) in detail. Describe its application in FM demodulation.	CO1	L2	Oct 2016(Reg), June 2020(Supply), Mid(2009)
	6	Discuss the nonlinear effects in FM systems and how they impact system performance.	CO1	L4	June 2018(Reg)
	7	With a block diagram, explain the process of Frequency Division Multiplexing. Give real-world applications.	CO1	L2	Oct 2014(Reg)
	8	Explain in detail the difference between Frequency Modulation and Phase Modulation with mathematical expressions.	CO1	L2	Dec 2023(Supply), Mid(2019)
	9	Discuss various types of communication channels and their characteristics.	CO1	L2	April 2024(Supply), GPCET- Mar 2022
	10	Elaborate on the need for modulation and explain the consequences of transmitting baseband signals without modulation.	CO1	L4	June 2022(Reg), GPCET- Mar 2022
Unit 2	1	Explain various types of noise in communication systems with examples.	CO2	L4	2019(Supply)
	2	With a block diagram, explain the receiver model and discuss how noise affects its performance.	CO2	L2	June 2014(Reg), Mid(2015)

	3	Compare the performance of AM, DSB, SSB, and FM receivers in the presence of noise.	CO2	L2	2022(Reg), Mid(2015), GPCET- Mar 2022
	4	Explain the process of pre-emphasis and de-emphasis in FM systems. Support your answer with suitable circuits and graphs.	CO2	L3	April 2018(Reg),
	5	With the help of diagrams, explain PAM, TDM, and the sampling theorem. Highlight how they are interrelated.	CO2	L4	June 2013(Supply), Mid(2011)
	6	Describe the quantization process in detail and derive the expression for quantization noise power in PCM.	CO2	L2	April 2019(Supply), June 2020(Supply), Mid(2016)
	7	Explain the complete working of a PCM system with a neat block diagram. Discuss noise considerations in PCM.	CO2	L2	June 2022(Reg), Mid(2015)
	8	Describe the working of Delta Modulation and how it overcomes the limitations of PCM. Mention slope overload and granular noise.	CO2	L3	April 2013(Reg), Mid(2019)
	9	With block diagrams, explain the functioning of DPCM. How does it achieve compression?	CO2	L2	Oct 2022(Reg), Mid(2013)
	10	Explain techniques used for coding speech at low bit rates. Discuss the trade-offs involved.	CO2	L2	June 2015(Reg), Mid(2017)
Unit 3	1	Explain the principle and operation of correlative coding.	CO3	L4	2019(Supply)
	2	For input binary data 1011101 obtain the output of duo binary encoder and also the output of decoder	CO3	L3	June 2014(Reg), Mid(2015)
	3	State and prove the properties of Matched filter.	CO3	L3	2022(Reg), Mid(2015), GPCET- Mar 2022

	4	. What is matched filter? Derive the expression for the probability of bit error of a matched filter	CO3	L2	April 2018(Reg),
	5	Discuss the Inter symbol interference problem and explain how the Nyquist pulse shaping criterion helps eliminate it.	CO3	L4	June 2013(Supply), Mid(2011)
	6	Draw the eye pattern. Explain the useful information provided by an eye pattern.	CO3	L3	April 2019(Supply), June 2020(Supply), Mid(2016)
	7	Explain duo binary coding and its advantages. Deduce the duo binary coding for the binary Data 001011	CO3	L2	June 2022(Reg), Mid(2015)
	8	What is raised cosine pulse? Describe with the help of diagram.	CO3	L2	April 2013(Reg), Mid(2019)
	9	In a T1 carrier system the bit duration is 0.647μsec. Find transmission bandwidth for roll off factors of (i) α=1 (ii) α=0.5 (iii) α=0.25 (iv) α=0	CO3	L3	Oct 2022(Reg), Mid(2013)
	10	Explain briefly about baseband M array PAM transmission	CO3	L3	June 2015(Reg), Mid(2017)
Unit 4	1	Explain the concept of maximum likelihood decoding in detail	CO4	L3	2018(Supply), June 2020(Supply),
	2	. Explain the methods to find basis function in Gram-Schmidt Orthogonalization procedure	CO4	L2	Oct 2016(Reg), Mid(2017)
	3	Explain geometric representation of signals.	CO4	L3	April 2018(Supply), Mid(2018)
	4	Explain correlation receiver with neat block diagram.	CO4	L2	April 2014(Reg), GPCET-Mar 2022
	5	Explain about the Gram-Schmidt process in band pass digital transmission	CO4	L3	2023(Reg), Mid(2012)
	6	Discuss the role of signal representation in communication	CO4	L2	Oct

		systems. Explain how signal representation influences various aspects of system performance, such as bandwidth efficiency, noise resilience, and error rates.			2022(Supply)
	7	Discuss how geometric representation helps in the analysis and design of modulation schemes. Use diagrams and mathematical equations to support your explanation.	CO4	L2	April 2023(Reg)
	8	Describe the Gram-Schmidt orthogonalization process in detail. Provide a step-by-step example with three non-orthogonal vectors and show how they are transformed into an orthogonal set.	CO4	L2	April2024(Supply), June 2020(Supply), Mid(2017)
	9	Explain the principle of coherent detection with a detailed block diagram. Discuss its application in digital communication systems and analyze its advantages over non-coherent detection methods.	CO4	L2	June 2021(Reg)
	10	Describe the operation of a correlation receiver with a detailed block diagram. Explain how it detects signals and maximizes the signal-to-noise ratio. Include mathematical derivations to support your explanation.	CO4	L2	June2023(Supply), Mid(2021)
Unit 5	1	For the signals, the given bit rate is 10Kbps. Estimate the bandwidth for ASK and FSK signals.	CO5	L2	June2023(Supply), Mid(2021)
	2	Assume that 3600 bits/sec data is sent over a pass band channel by FSK signalling scheme. Estimate the transmission bandwidth.	CO5	L2	June2022(Reg), June 2020(Supply), Mid(2016)
	3	. A voice signal is sampled at the rate of 5000 samples/sec and each sample is encoded into 5-bits using PCM system. The binary data is transmitted into free space after modulation. Determine the bandwidth of the modulated signal, if the modulation used is a) ASK b) PSK c) FSK where f1=8MHz and f2=6MHz.	CO5	L2	Oct 2019(Reg), GPCET-Mar 2022
	4	Binary data is transmitted over an RF band pass channel with a usable bandwidth of 10MHz at a rate of 4.8x106bits/sec using an ASK signaling method. The carrier amplitude at the receiver antenna is 1mV and noise power spectral density at the receiver input is 10-15Watt/Hz. Determine the error probability of a coherent receiver.	CO5	L3	June 2014(Supply),Mid(2021)

	5	Assume that 4800 bits/sec random data are sent over band pass channel by using the following schemes: A) BPSK b) FSK Determine the Transmission bandwidth.	CO5	L2	June 2022(Reg), Mid(2014)
	6	Describe the generation, detection, and power spectrum of Binary Frequency Shift Keying (BFSK). Use block diagrams and mathematical equations to illustrate your points.	CO5	L2	April 2022(Supply), Mid(2008), GPCET-Mar 2022
	7	Explain the generation and detection of non-coherent Binary Frequency Shift Keying (BFSK). Discuss the advantages and disadvantages of non-coherent detection compared to coherent detection. Provide mathematical expressions and block diagrams.	CO5	L2	April 2019(Supply),Mid(2011)
	8	Analyze the power spectra of BPSK, QPSK, BFSK, M-array PSK, and M-array QAM. Discuss how the power spectrum affects the performance of a communication system. Provide mathematical expressions and graphical representations.	CO5	L3	June 2014(Reg), Mid(2018), GPCET-Mar 2022
	9	Discuss the principles of Differential Phase Shift Keying (DPSK). Describe its generation and detection methods. Include block diagrams and mathematical derivations in your explanation.	CO5	L3	April2022(Supply),
	10	Discuss the principles of Binary Phase Shift Keying (BPSK). Describe its generation, detection, and power spectrum. Provide mathematical expressions and block diagrams to support your explanation.	CO5	L3	June 2014(Reg), June 2020(Supply), Mid(2023)