Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Fifth Semester - Regular) Examinations, November – 2024

22BECPC35002 – Digital Communication
(ECE)

Time: 3 hrs   Maximum: 70 Marks

Answer ALL questions
(The figures in the right hand margin indicate marks)

PART – A   **(2 x 5 = 10 Marks)**

Q.1. Answer *ALL* questions

		CO #	Blooms Level
a.	Define : Sampling theorem	CO1	K1
b.	The bit rate of digital communication system is R kbit/s. The modulation used is 32-QAM. Calculate the minimum bandwidth required for ISI free transmission channel.	CO1	K2
c.	What is QPSK? Write down the expression for the QPSK signal.	CO2	K2
d.	What is Intersymbol interference?	CO2	K2
e.	Write a Short notes about Matched filter.	CO2	K2

PART – B   **(15 x 4 = 60 Marks)**

Answer *All* the questions

		Marks	CO #	Blooms Level
2. a.	Explain ADM with Transmitter and Receiver block diagram.	8	CO1	K2
b.	Summarize the advantages of adaptive delta modulation.	7	CO1	K3
	(OR)			
c.	A signal having bandwidth of 3kHz is to be encoded using 8 bit PCM and DM system. If 10 cycles of signal are digitized, state how many bits will be digitized in each case if sampling frequency is 10 kHz? Also find bandwidth required in each case.	8	CO1	K2
d.	illustrate the difference between DM and ADM.	7	CO1	K3
3.a.	In a QPSK system, the bit rate of NRZ stream is 10 Mbps and carrier frequency is 1GHz. Determine the symbol rate of transmission and bandwidth requirement of the channel.	8	CO2	K3
b.	Derive the expression for bit error probability of QPSK system.	7	CO2	K3
	(OR)			
c.	List the difference between QAM and QPSK.	8	CO2	K3
d.	Describe QPSK signalling with diagrams.	7	CO2	K2
4.a.	What is known as Inter symbol Interference (ISI)? What are the primary causes of it? How can it be minimized by pulse shaping?	8	CO4	K1
b.	Derive the Nyquist criteria for zero ISI or No ISI.	7	CO4	K2
	(OR)			
c.	Why timing extraction is required in a digital communication system? Explain in details.	8	CO1	K2
d.	Derive the PSD of polar and Bipolar signalling.	7	CO2	K5
5.a.	Derive the formula for output SNR of a matched filter.	8	CO3	K3
b.	Describe the principle of signal reception using a correlator type receiver	7	CO3	K2

<p style="text-align:center">(OR)</p>

c.	What do you mean by Optimum Filter? Derive the expression of probability of error of optimum filter.	8	CO3	K2
d.	Explain the information provided in eye diagram.	7	CO3	K3

<p style="text-align:center">--- End of Paper ---</p>