Total number of printed pages: **3**

D/4th/DECE403

2024

SUBJECT NAME: Digital Communication Systems

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions*

Q.1	a)		Fill in the banks	10
		i)	DPCM stands for	
		ii)	DM uses ..... level Quantizer.	
		iii)	Complexity of DM is .....than PCM.	
		iv)	If fm=1khz then Ts(max)=.....	
		v)	One of the design goals for choosing a particular digital modulation technique is .....data rate.	
		vi)	PCM uses ..... level Quantizer.	
		vii)	Complexity of DPCM is .....than DM.	
		viii)	..... bit encoder is used by DM.	
		ix)	DM stands for	
		x)	Digital communication system uses channel encoder for ..... detection and correction at receiver .	
	b)	i)	Draw the block diagram of DPCM transmitter.	5
		ii)	Explain the DPCM transmitter block diagram.	5
Q.2	a)		Write down whether the following statements are true or false	5
		i)	There is no difference between digital and binary signals.	
		ii)	DM steps are sampling quantization and encoding.	
		iii)	Minimum data rate is one of the design goals of choosing any digital modulation techniques.	
		iv)	Error signal is quantized for DPCM.	
		v)	Sampled signal itself is quantized for PCM.	
	b)	i)	Draw voltage transfer characteristics of a Quantizer.	2
		ii)	Compare DPCM and DM	2
	c)	i)	Draw the block diagram digital communication system	6
		ii)	Explain above block diagram	5

Q.3	a)		Fill in the blanks	5
		i)	32 levels to encode number of bits required is	
		ii)	To sample a analog signal having fm=1khz minimum sampling rate is	
		iii)	For BPSK if logic 0 is sinwt then logic 1 can be	
		iv)	Internet is a application of ..... Communication.	
		v)	For digital modulation techniques carrier signal is .....in nature	
	b)		Write down whether the following statements are true or false	5
		i)	FOR BPSK two sin signal may be out of phase.	
		ii)	FOR BASK two sin signal may be sinwt and -sinwt.	
		iii)	If you do not follow sampling theorem reconstruction of signal will be problematic	
		iv)	Complexity of BFSK generation is more than BASK.	
		v)	Bandwidth requirement of BFSK is more than BASK.	
	c)	i)	Draw a analog signal	1
		ii)	Sample the above signal and complete drawing	1
		iii)	Draw a quantized signal.	1
		iv)	Draw a encoded signal.	1
	d)	i)	Draw BPSK signal for a bit pattern 1001	3
		ii)	Draw BASK signal for a bit pattern 1001	3
Q.4	a)	i)	Draw the block diagram of BPSK transmitter and explain how BPSK signal is generated with help of signal drawing.	3+3=6
		ii)	Draw the block diagram of BFSK transmitter and explain how BFSK signal is generated with help of signal drawing.	4+5=9
	b)		Write down whether the following statements are true or false	5
		i)	Binary bipolar signal multiplied with carrier signal for BASK generation.	
		ii)	Binary on off signal (unipolar) multiplied with carrier signal for BPSK generation	
		iii)	Decision device is used in receiver block diagram of all digital modulation techniques.	
		iv)	Integrator is used in transmitter block diagram of all digital modulation.	
		v)	A/D converter is required when original signal tobe transmitted is digital in nature.	
Q.5	a)			
		i)	State sampling theorem.	2
		ii)	Draw a continous time signal and it's discrete time signal .	2
		iii)	State sampling theorem.	3
		iv)	If Ts(max)=0.1ms then find out fm in khz	2
	b)		Explain PCM with the block diagram and drawing different processed signal	3+3

	c)	i)	Draw BFSK signal for a bit pattern 001	2
		ii)	Draw BFSK transmitter	3
Q.6	a)	i)	Advantages of digital communication system over analog communication systems	3
		ii)	Design goals for choosing any digital modulation techniques	3
	b)	i)	Function of channel encoder	2
		ii)	Function of channel decoder	2
	c)	i)	Draw BFSK Receiver	4
		ii)	Explain BFSK Receiver	6