GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fifth Semester – Regular) Examinations, December – 2022

BPCEC5020 - Digital Communication
(ECE)

Time: 3 hrs   Maximum: 70 Marks

Answer ALL Questions
The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)   **(1 x 10 = 10 Marks)**

Q.1. Answer **ALL** questions   [CO#]   [PO#]

a. Regenerative repeaters are used for   CO4   PO1

    (i) Eliminating noise   (ii) Construction of signals

    (iii) Transmission over long distances   (iv) All of the above

b. Indicate which of the following pulse modulation system is analog   CO1   PO1

    (i) PCM   (ii) Differential PCM

    (iii) PWM   (iv) Delta modulation

c. The probability error of DPSK is _____ than that of BPSK. The band width of BFSK is _____ than BPSK.   CO2   PO2

    (i) Higher, Higher   (ii) Lower, Lower

    (iii) Higher, Lower   (iv) Lower, Higher

d. The biggest disadvantages of PCM is   CO1   PO1

    (i) Its inability to handle analog signal   (ii) The high error rate which its quantizing noise introduces

    (iii) The large bandwidths that is required for it.   (iv) Its incompatibility with TDM

e. The maximum data transmission rate in T1 carrier system is   CO2   PO2

    (i) 2.6 megabits per second   (ii) 1000 megabits per second

    (iii) 1.544 megabits per second   (iv) 5.6 megabits per second

f. In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates   CO4   PO1

    (i) No carrier   (ii) Half the carrier amplitude

    (iii) Amplitude of modulating signal   (iv) None of the above

g. The maximum bandwidth is occupied by   CO2   PO1

    (i) ASK   (ii) BPSK

    (iii) FSK   (iv) None of the above

h. QPSK system uses a phase shift of   CO2   PO2

    (i) Π (ii) $\Pi/2$

    (iii) $\Pi/4$ (iv) 2Π

i. The digital modulation scheme in which the step size is not fixed is   CO2   PO1

    (i) Delta Modulation   (ii) Adaptive delta modulation

    (iii) DPCM   (iv) PCM

j. The characteristics of compressor in μ-law companding are   CO1   PO3

    (i) Continuous in nature   (ii) Logarithmic in nature

    (iii) Discrete in nature   (iv) Linear in nature

PART – B: (Short Answer Questions)   **(2 x 10 = 20 Marks)**

Q.2. Answer *ALL* questions

		[CO#]	[PO#]
a.	States important properties of line codes.	CO4	PO1
b.	What is the advantage of gray coding in the QPSK system?	CO3	PO2
c.	Draw the spectrum of BFSK and find out the bandwidth used in it.	CO2	PO1
d.	What is meant by aliasing effect and how it can be avoided?	CO1	PO1
e.	Illustrate the disadvantages of delta modulation.	CO2	PO1
f.	What is the difference between coherent and non-coherent modulation schemes?	CO4	PO2
g.	Mention the equation of BPSK & BFSK.	CO2	PO1
h.	What do you mean by matched filter?	CO4	PO1
i.	Define signal space diagram.	CO3	PO3
j.	What is meant by "Adaptive" in adaptive delta modulation?	CO1	PO1

PART – C: (Long Answer Questions)   **(10 x 4 = 40 Marks)**

Answer *ALL* questions

		Marks	[CO#]	[PO#]
3. a.	With the help of neat block diagram explain the principle of adaptive delta modulation.	5	CO1	PO1
b.	Differentiate between PCM and DPCM.	5	CO1	PO1
	(OR)			
c.	Explain about μ-law companding in details.	5	CO2	PO2
d.	Explain working principle of the T1 digital system. What to do mean by frame? How frame synchronization is achieved in this system?	5	CO1	PO2
4. a.	In a binary PCM system, the output signal-to-quantizing-noise ratio is to be held to a minimum value of 40 dB. Determine the number of required levels and find the corresponding output signal to quantizing noise ratio.	5	CO1	PO2
b.	Draw and explain the modulator and demodulator circuit of BPSK.	5	CO2	PO3
	(OR)			
c.	What do you mean by DPSK? Explain in details.	5	CO2	PO1
d.	Explain about the operation of MSK modulator and demodulator circuit in details.	5	CO2	PO1
5. a.	What is ISI? Explain the causes of ISI. Is it detrimental to a communication system's performance?	5	CO3	PO1
b.	What is eye pattern? How is eye pattern obtained on CRO? What is the role of it in communication system?	5	CO3	PO1
	(OR)			
c.	Define ISI. Derive the expression of Nyquist criterion for zero ISI.	6	CO4	PO1
d.	Draw and explain in details about a regerative repeater.	4	CO2	PO1
6. a.	Why timing extraction is required in a digital communication system? Explain.	5	CO3	PO1
b.	Define PSD? Derive the expression to find out the PSD of unipolar signalling.	5	CO3	PO2
	(OR)			
c.	What do you mean by an optimum filter? Explain.	5	CO4	PO3
d.	Explain about the operation of a baseband signal receiver.	5	CO4	PO2

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