Reg. No. : | | | | | | | | | | | | |

Question Paper Code:U4B03

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Fourth Semester

Biomedical Engineering

21UBM403 - COMMUNICATION SYSTEMS

(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1.	State the Carson's Rule.	CO1-U
2.	Differentiate between the FM , AM and PM	CO1-U
3.	Define Aliasing	CO1-U
4.	List out the limitations of Delta Modulation over ADM	CO2-App
5.	Define FSK,bit rate and baud rate	CO1-U
6.	Lable the PSK signal for the given input message signal 101101	CO1-U
7.	State shannon's channel coding theorm.	CO1-U
8.	Why is error control code is important?	CO2-App
9.	Compare TDMA and FDMA.	CO1-U
10.	Define OFDMA.	CO1-U

PART – B (5 x 16= 80 Marks)

11.	(a)	Define the concept of AM wave and explain its generation and detection using the balanced Modulators.	CO1 U	(16)
		Or		
	(b)	Discuss and analyze the generation and detection of DSBSC.	CO1- U	(16)
12.	(a)	With block diagram explain about the Pulse code Modulation Process briefly.	CO1- U	(16)
		Or		
	(b)	List the draw backs of Delta Modulation and Explain Adaptive Delta modulation technique with transmitter and Receiver.	CO1- U	(16)

13. (a) Define Binary phase shift keying. Discuss in detail the BPSK transmitter as well as Receiver and also obtain the double sided Nyquist Bandwidth. CO1- U (16)

Or

(b) Discuss the operation of QPSK transmitter and receiver with neat diagram draw its waveform and constellation diagram. CO1- U (16)

14. (a) The generator Matrix for a (6,3) block code is given below . find all code vectors of this code. CO3- Ana (16)

$$G = \begin{bmatrix} 1 & 0 & 0{:}0 & 1 & 1 \\ 0 & 1 & 0{:}1 & 0 & 1 \\ 0 & 0 & 1{:}1 & 1 & 0 \end{bmatrix}$$

i) Find the parity check matrix.

ii) Find Minimum weight of this code.

Or

(b) A rate 1/3 convolution encoder has generating vectors as CO3- Ana (16)

$g_1 = (1\ 0\ 0)$, $g_2 = (1\ 1\ 1)$, $g_3 = (1\ 0\ 1)$.

I) Sketch the encoder configuration.

II) Draw the code tree, state diagram, and trellis diagram

15. (a) Describe the Frequency hopping spread spectrum technique CO1- U (16)

Or

(b) Describe the operation of FDMA multiplexing system. CO1- U (16)