GALGOTIAS UNIVERSITY

ADMISSION NUMBER

School of Engineering

B.TECH Electronics and Communication Engineering
Semester End Examination - Jun 2024

Duration : 180 Minutes
Max Marks : 100

Sem IV - G2UA402T - Analog and Digital Communication

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	What is Carson's rule in context of FM wave.	K1(2)
2)	Represent binary FSK symbols in the two-dimensional orthogonal signal space.	K2(4)
3)	A signal m(t) band-limited to 3 kHz is sampled at a rate 33.33 % higher than the Nyquist rate. The maximum acceptable error in the sample amplitude (the maximum quantization error) is 0.5% of the peak amplitude mp. The quantized samples are binary coded. Find the minimum bandwidth of a channel required to transmit the encoded binary signal. If 24 such signals are time-division multiplexed, determine the minimum transmission bandwidth required to transmit the multiplexed signal.	K2(6)
4)	A 400 W carrier is amplitude modulated to a depth of 100%. Calculate the total power in case of AM and DSBSC techniques. How much power saving (in W) is achieved for DSBSC? If the depth of modulation is changed to 75%, then how much power (in W) is required for transmitting the DSBSC wave? Compare the powers required for DSBSC in both the cases and comment on the reason for change in the power levels.	K3(9)
5)	Illustrate two different forms of pulse-time modulation for the case of a sinusoidal modulating wave. Draw the waveforms of message, carrier, PDM, PPM wave.	K3(9)
6)	Draw and explain Coherent detection for PSK.	K5(10)
7)	Explain Delta Modulation. Draw the block diagrams of transmitter and receiver.	K4(12)
8)	Explain mathematically quadrature PSK. Derive the condition for choosing the signal points in the interest of obtaining the best immunity against noise.	K5(15)
9)	Draw and explain suitable block diagrams for Non-coherent and coherent detection of FSK.	K5(15)
10)	In an PM system, when the audio frequency (AF) is 500 Hz, and the AF voltage is 2.4 V, the deviation is 4.8 kHz. If the AF voltage is now increased to 7.2 V, what is the new deviation? if the AF voltage is further raised to 10 V while the AF is dropped to 200 Hz, what is the deviation? Find the modulation index in each case.	K6(18)