Question Paper

Exam Date & Time: 21-Nov-2022 (02:00 PM - 05:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

MANIPAL INSTITUTE OF TECHNOLOGY
SEVENTH SEMESTER B.TECH END SEMESTER EXAMINATIONS, NOV/DEC 2022

Telemedicine [BME 4070]

Marks: 50 **Duration: 180 mins.**

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1)		Determine whether frequency or amplitude of the signal is affected by phase-error in the synchronizing carrier used in the demodulation of DSB-SC signal? Justify.	(4)
	A)		
	B)	Select the appropriate linear modulation method that is well suited for the transmission of video in commercial television broadcasting applications with suitable reasons.	(3)
	C)	An AM signal is given by the expression: $V_{AM}(t) = 10[1+0.5 \sin(2\pi 10^3 t) + 0.2 \sin (4\pi 10^3 t)] \sin (2\pi 10^6 t)$, calculate (a) the net modulation index power (b) sideband power (c) total power of the AM signal.	(3)
2)		Illustrate the process of time division multiplexing in detail.	(5)
	A)		
	B)	Consider time- division multiplexing of 5 PAM signals with sampling time of 1msec. If the width of each sample pulse is 150µsec, find the guard time. If it is required to maintain the same guard time to avoid interference between samples, find the new pulse width to transmit 10 PAM signals in 1msec duration.	(3)
	C)	An angle modulated signal is given as $x(t) = 100\,Cos[400\pi t + \frac{\pi}{4}]$ Calculate the instantaneous frequency.	(2)
3)		Assuming the binary message data to be 11010010 and the initial bit to be 1, illustrate the method of generating a DPSK signal.	(5)
	A)		
	B)	Give reason: DPSK is known as the non-coherent version of PSK.	(2)
	C)	Differentiate FDMA from CDMA and mention the drawbacks of FDMA.	(3)
4)		Illustrate the steps in the PCM transmitter. Mention the advantages and disadvantages of increasing the quantization levels in the transmitter.	(5)
	A)		
	B)	Three voice signals, each having frequency range of 300 Hz- 3400 Hz, are frequency division multiplexed using 20KHz, 24KHz and 28KHz analog carrier signals. Find the minimum channel bandwidth of the resultant FDM signal, assuming 1KHz as guard band between the channels to avoid interference.	(3)

	C)	Draw the ASK waveform for the following binary data: 0 1 1 0 1 0 1	(2)
5)		Determine the drawbacks of symmetric key encryption. Explain how public key encryption can be done along with authentication of data.	(4)
	A)		
	B)	Discuss the ethical issues involved in telemedicine?	(2)
	C)	Determine two different standards used in healthcare? Explain the standard used for exchanging clinical data with a suitable example.	(4)

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