Question Paper

Exam Date & Time: 29-Dec-2022 (02:30 PM - 05:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SEVENTH SEMESTER B.TECH MAKE UP EXAMINATIONS, DEC/JAN 2022-23

Telemedicine [BME 4070]

Duration: 180 mins. Marks: 50 Answer all the questions. Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed 1) Show that for distortionless recovery of the baseband signal using square law detector, the (4)percentage modulation should be very small. A) B) Give a comparison of the different guided media. (3)C) Draw the frequency spectrum of the SSB signal (upper sideband), if the modulating signal is (3) $m(t) = \cos 2\pi .1000t + \cos 2\pi .2000t$ and the carrier is given by $c(t) = \cos 2\pi .10000t$ 2) Show that a phase modulated signal can be obtained using a frequency modulator. (5)A) B) A sinusoidal modulating wave of amplitude 5 V and frequency 1 KHz is applied to a frequency (3)modulator. The frequency sensitivity of the modulator is 40 Hz/V. The carrier frequency is 100 KHz. Calculate a) Frequency deviation b) Modulation index c) Bandwidth. C) An FM broadcast transmitter operates at its maximum frequency deviation of 75KHz. Compute the (2) extreme limits of the modulation index for modulating audio frequency range from 50Hz to 15KHz. How can a digital data be transmitted over an analog band pass channel? Determine any one (5) 3) modulation technique that can be used for this purpose. A) B) Pulse modulation systems are not completely digital in nature. Justify. (2)C) A composite signal with a baseband frequency range from 0 to 4 MHz is transmitted by Pulse Code (3) Modulation, using 8 bits per sample and a sampling rate of 10 MHz. a) Calculate the number of quantization levels b) Calculate the transmission bit rate c) What is the type of noise induced in this process. Define cryptography. Determine the different parameters that can be used for biometric security (4)4) and identification? Explain any two in detail. A) B) Differentiate NBFM from WBFM. (3)C) Define CDMA. Illustrate the concept of CDMA with an example. (3)

5)	Explain the following terms with reference to their importance in telemedicine: Firewall; Phisher; Jurisdiction; confidentiality of data.	(4)
A)		
B)	Differentiate 'private key' and 'public key' encryption.	(2)
C)	Determine the application of telemedicine in safeguarding the elderly and aging population.	(4)

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