

Name: _____

Roll No. _____

Digital Communication

Quiz 1

ETEC-303

Q1. What should be the minimum sampling rate for the below mentioned signal $x(t)$? [1 mark]

$$x(t) = \sin(600\pi t) + \cos(500\pi t)$$

a) 450 Hz

b) 500 Hz

c) 600 Hz

d) 700 Hz

Q2. Why is the sampling rate for a Delta modulator kept much higher than the Nyquist rate? [1 mark]

Q3. What would be the SNR in dB for 8-bit PCM system with sinusoidal input? [1 mark]

Q4. What should be the Nyquist rate for the following signal? [2 marks]

$$x(t) = \frac{1}{2\pi} \cos(3000\pi t) \cos(1000\pi t)$$

Q5. For a Delta modulator, designed to avoid slope overload distortion, what should be the minimum sampling rate for a sinusoidal input of frequency 8KHz if the SNR must be at least 30dB? [3 marks]

Q6. An n-bit PCM system has an input that varies between $-2V$ to $4V$ and has power $2W$. The communication established using this system is said to be effective only when the signal power is at least 1000 times larger in comparison to the noise power. Hence, for effective communication, find the minimum value of n. [4 marks]

Q7. Use of non – uniform quantization for audio signals in PCM systems facilitates which of the following? [1 mark]

- a) Makes weak portions of signal stronger and strong portions of signal weaker
- b) Reduces number of bits required for representing strongest signals
- c) Decreases the dynamic range of the input signal
- d) All the above

Q8. A-law companding, as against μ -law companding, is [1 mark]

a) Purely linear

b) Purely Non-linear

c) Partly linear partly non-linear

Q9. Practical implementation of μ -law companding is [1 mark]

a) Completely Linear

c) Completely Non-linear

b) Partly linear partly non-linear

d) Piecewise Linear

Score: ____ / 15