Tutorial 9

Instructions

1. Form ad-hoc groups of 2 to 3 students to solve this week's exercise.
2. Each group must answer the following review Q's
3. Each group will use shared google docs to work with all group members and tutor. The document must include the group members' names and the tutorial sheet number.

Review Questions

1. Q7-1. How can we find the period of a sine wave when its frequency is given?

2. Q7-5. Which of the following are causes of transmission impairment?
   a) Attenuation
   b) modulation
   c) noise

3. Q7-9. Define baseband transmission?

4. Q7-11. Define the theoretical maximum channel capacity bit rate of a noiseless channel using Nyquist theorem and Shannon's theorem for noisy channel?

5. Differentiate between guided media and unguided media?

6. Define channel capacity?

7. Q7-19. Which characteristics of an analog signal are changed to represent the analog signal in each of the following analog-to-analog conversions?
   a. FM
   b. PM
8. Q7-23. Define synchronous TDM and compare it with statistical TDM.

9. Q7-27. What are the **three** major classes of guided media?

10. P7-15. A signal has passed through three cascaded amplifiers, each with a 4 dB gain. What is the total gain? How much is the signal amplified?

11. P7-19. We measure the performance of a telephone line (4kHz of bandwidth). When the signal is 10V, the noise is 10 mV. What is the maximum data rate supported by this telephone line?

12. P7-35. We have sampled a low-pass signal with a bandwidth of 200 kHz using l024 levels of quantization.
    a. Calculate the bit rate of the digitized signal.
    b. Calculate the SNR for this signal.
    c. Calculate the PCM bandwidth of this signal.

13. P7-59.An copper Shielded Twisted Pair(STP) cable has a loss of 1 dB per Km at 10 kHz. We want to have a link of 10 Km using this cable. What should the power of the signal be at the source if we want the signal to have 10 mW power at the destination?

14. A digital signalling system is required to operate at 1200 bps. If a signal element encodes a 4-bit word, what is the minimum required bandwidth of the channel?