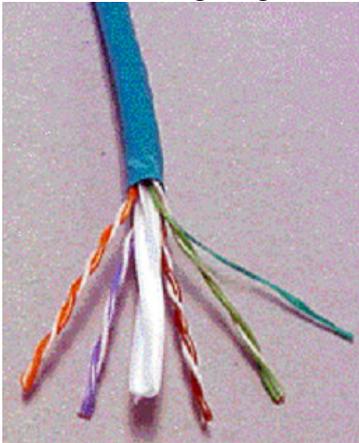




Tutorial 3:

1. What does CSMA/CD stand for? Explain a collision.
2. Among different media access control methods, which one is the best? Explain your answer in terms of their performance.
3. a) If a voltage of 1 volt rms is applied at the sending end of a telephone cable of length 1000 miles, determine the voltage at the receiving end. Assume that the attenuation in the cable is 1dB/mile.
b) It is desired to obtain a 1 volt rms signal at the receiving end. This can be accomplished by using repeaters. Assume that repeaters yield a maximum rms output of 1 volt and have a voltage gain of 100. Determine the number of repeaters needed and the spacing between them.
4. In the following diagram, identify the cable type and state its characteristics:



5. With the aid of diagram, explain how fiber optics works?
6. Distinguish between multimode and singlemode fiber.
7. Describe the technology behind the power line carrier.
8. The following setting is used in a serial communication link.
 - * Baud rate – 9600
 - * Data bits – LSB first
 - * Start bit – 1 start bit
 - * Stop bits – 2 stop bits
 - * Parity – even parity
 - * Flow control – none

Determine the parity bit and hence sketch the signal in the TD line if a binary data 01010011 is transmitted.



9. The following figure shows two DB-9 connectors. Sketch the minimum cable connection for connecting two DTEs with setting of flow control to none.



10. Among the EIA standard, RS232 and RS485, which one is for balanced multipoint application? Sketch the multipoint connection.

11. Fill in the following table:

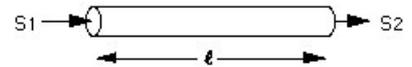
	RS232	RS485
Topology		
Devices on the network		
Mode of operation		
Max. cable length		
Max. data rate		



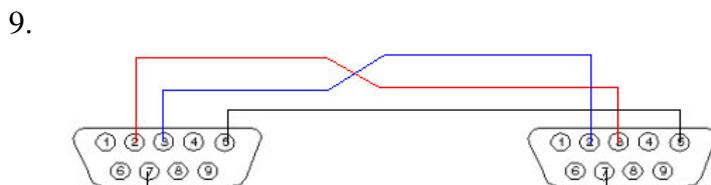
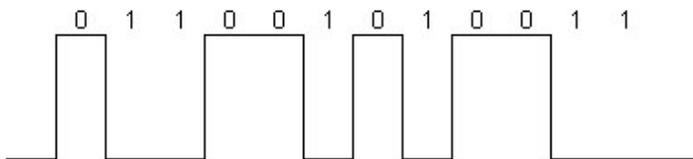
Solution Guide:

1. CSMA/CD stands for carrier sense multiple access with collision detection. A collision is said to occur when two or more stations assert their packets onto the communication channel at the same time.
2. Access Methods - page 13
3. a) $20 \log (V2/V1) = -1000\text{dB}$
 $\Rightarrow V2 = 1e-50 \text{ Vrms}$
 b) attenuation caused by cable between repeaters = $20 \log (100) = 40\text{dB}$
 \Rightarrow cable length = space between repeaters = 40 mile
 \Rightarrow total number of repeaters = $1000/40 = 25$

4. Cat6.
 - * Not shielded
 - * 100Ω Characteristics Impedance
 - * 250MHz Bandwidth
 - * Recommended conductor size of 24AWG



5. Transmission Links – page 20
6. Transmission Links – page 21-22
7. Transmission Links – page 29.
8. Parity bit = 0



10. Serial Communications - page 19
- 11.

	RS232	RS485
Topology	Point-to-Point	Bus
Devices on the network	2	32
Mode of operation	Unbalanced	Balanced
Max. cable length	50 ft	4000 ft
Max. data rate	20 kbps	10Mbps

