Lab 2 – Introduction to Communications

What you will do:

Use the equipment provided to transmit data as instructed.

Things that you will need to know or learn:

Make sure you understand the following terms after completing the exercises.

- Simplex, Half-Duplex and Full-Duplex
- Protocol
- Point-to-point
- Point-to-multipoint
- Framing
- Attenuation

What you need to submit and when:

Submit page 1 at the end of your lab class. One submission per group

Required Equipment:

- The required sophisticated communication equipment will be provide to you in class

Marks:

- In lab checks 14 points (1/2 of marks for this lab)
- Pre-lab 2 ½ marks for this lab

Task 0: Form groups of at most 6 students

Assigned Equipment Set:_____

Student Name (Please Print):_____

Student Name (Please Print):_____

Student Name (Please Print):_____

Student Name (Please Print):_____

Student Name (Please Print):_____

Student Name (Please Print):_____

Lab instructor sign off (2 points each)

Task 1:_____
Task 2:_____
Task 3:_____
Task 4:_____
Task 5:_____
Task 6:_____
Task 7:_____

Task 1: Simplex, point-to-point communication

Using equipment from your assigned equipment set; build a simple simplex point to point network. Develop a protocol that will allow you to send and receive information if you couldn't see the party at the other end of the system. Your protocol should ensure the reliable transmission of data.

a. Describe your protocol.

b. Test your protocol using the data provided in the lab. If your protocol didn't work, explain why below.

c. Make any necessary changes and re-test your protocol with the new data provided.
d. Which layer(s) of the OSI stack does your protocol describe?

Task 2: Half-Duplex, point-to-point communication

a. Modify your communications protocol to send data both directions. How would you change your protocol to ensure reliable delivery of the data?

b. Test your protocol using the data provided in the lab. If your protocol didn't work, explain why below.

c. Make any necessary changes and re-test your protocol with the data provided.

Task 3: Full-Duplex, point-to-point communication

a. Modify your communication system so that data may be sent in both directions at the same time. Briefly describe your protocol below.

b. Draw a diagram of your system.

c. Test your protocol using the data provided in the lab. If your protocol didn't work, explain why below.

d. Make any necessary changes and re-test your protocol with the data provided.

Task 4: Simplex, point-to-multipoint communication

a. Modify your protocol so that 3 or 4 stations are connected. Station 1 will be the transmitter, but any of the other stations or all the stations may be the intended receiver. Briefly describe your protocol below.

b. Test your protocol using the data provided in the lab. If your protocol didn't work, explain why below.

c. Make any necessary changes and re-test your protocol with the data provided.

Task 5: Half-Duplex, point-to-multipoint communication

a. Modify your protocol so that 3 or 4 stations are connected. Station 1 will be the transmitter, but any of the other stations may be the receiver. Briefly describe your protocol below.

Task 6: Full Duplex point-to-multipoint communication

a. Modify your protocol so that all stations can either send and receive at the same time. Briefly describe your protocol below.

b. Draw a diagram of your "network"

Task 7: Extending the range of your "network"

a. What is limiting the range (distance between stations) of your network?

b. Describe at least 2 things that you could do to extend the range while ensuring that data transfer remains reliable