**Homework – Communications**

Email PDF version no later than beginning of next class.

1. Fill in the blank *(20 points)*
2. In serial communications, setting baud rates with 8N1 means \_\_\_\_, \_\_\_\_\_\_, \_\_\_\_\_
3. Legacy RS-232 equipment like modems and a mouse use a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ device
4. I2C stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is \_\_\_\_-speed, \_\_\_\_-duplex
5. RS-485 stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is \_\_\_\_-speed, \_\_\_\_-duplex
6. Serial ports are asynchronous; devices must agree to a \_\_\_\_\_\_ rate a priori
7. Serial ports \_\_\_\_\_\_\_ be networked easily
8. In I2C, SDA is the \_\_\_\_\_ line and SCL is the \_\_\_\_\_\_\_ line
9. 7-bit address of a slave means that \_\_\_\_\_\_ slave devices can be connected
10. PCF8574 is an I2C-based \_\_\_\_\_\_\_\_\_\_ expander
11. The PCF8574 has an \_\_\_\_\_\_\_\_-bit digital port.
12. Work with a partner since two NXT Bricks are required. Write the following NXC program (20-points total)

The ~~Master~~ Leader Brick iterates incrementally by 1, from 1 to 20 (e.g. using a for-loop) and displays this value on its screen. At each iteration this Brick also transmits via RS-485, the value to the ~~Slave~~ Follower Brick. The ~~Slave~~ Follower Brick upon receiving this value displays the corresponding value squared. Provide (1) the name of your partner; (2) both the ~~Master~~ Leader and ~~Slave~~ Follower NXC code (10-points); and (3) a YouTube URL demonstrating the program in operation (10-points)

1. Work with a partner since two NXT Bricks are required (20-points total)

Write NXC programs to detect a ~~Master’s~~ Leader’s button push states as follows. Pushing the ~~Master’s~~ Leader’s left or right arrow buttons sends via Bluetooth, a 1 or 2 respectively. The ~~Slave~~ Follower receives these numbers and displays on its LCD screen the messages “Left” or “Right” respectively. Provide (1) the name of your partner; (2) the ~~Master~~ Leader and ~~Slave~~ Follower NXC code (10-points); and (3) a YouTube URL demonstrating the program in operation (10-points)