# Homework – Communications

Email PDF version no later than beginning of next class.

1. Fill in the blank *(20 points)*

   A. In serial communications, setting baud rates with 8N1 means ____, _____, _____
   B. Legacy RS-232 equipment like modems and a mouse use a _____ device
   C. I2C stands for _____ and is ____-speed, ____-duplex
   D. RS-485 stands for _____ and is ____-speed, ____-duplex
   E. Serial ports are asynchronous; devices must agree to a _____ rate a priori
   F. Serial ports _____ be networked easily
   G. In I2C, SDA is the _____ line and SCL is the _____ line
   H. 7-bit address of a slave means that _____ slave devices can be connected
   I. PCF8574 is an I2C-based _____ expander
   J. The PCF8574 has an _____-bit digital port.

2. 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)

3. 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)