homework 4

1. indicate which of the following features better describes a point-to-point and bus network

   sharing of data line among multiple devices: bus network

   area efficient: bus network

   use of master and slave device concept: bus network

   No need for arbitration mechanism: point to point

   fast communication among devices: point to point

2. during the execution of program a, device b interrupts. after a while when isr of device b is executing the `AND` instruction, device c interrupts. ret indicates end of a program. based on the time of interrupt request from the devices and the execution flow of the programs, match the program/device with their priority levels by drawing lines:

   device c: mid priority

   device b: highest priority

   program a: lowest priority

3. the following stream of bits starting with idle bits is encoded in `RS232` frame format where the data segment is 1 byte and has 1 parity bit. what is the actual data byte?

   11111110000101101111111

   answer: 00010011

4. si-five interrupt architecture, which of the following cases are handled by core local interrupts (clint)? you can choose multiple

   interrupt from i2c: no

   software interrupts: yes

   timer interrupts: yes

   interrupt from uart: no

5. the following figure conatins a waveform of scl and sda of an i2c bus along with the format of the data frame. assume that the particular slave device only has one register. therefore, no register address is needed (crossed out). based on these two figures, match the correct value for slave address, data, and r/w bit in the sda waveform.

   r/w bit: 1

   data byte: 10011100

   device slave address (7 bits): 1100110

6. which are the features of inter-integrated circuit protoccol i2c?

   asynchronous and serial communication: no

   support for only one master but many slave devices: no

   support for multiple master and slave devices: yes

   synchronous and serial communication: yes

7. match the communication device with their appropriate communication types (simplex, half duplex, full duplex).

   walkie-talkie: half duplex

device in serial peripheral interface communication: full duplex

telephone: full duplex

television broadcasting: simplex

device in inter-integrated circuit protocol (i2c): half duplex

wired speakers: simplex

8. suppose you are sending data over a uart interface at a baud rate fo 1024 bps. the channel is short so we don't use any parity bit for error detection. how long should it take to send a single 8-bit character using rs232 frame format? consider 1 start and 2 stop bits

   10.74 milliseconds