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Signals and Systems

ACDA4009

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BEng Embedded Electronic Systems

Question 1)

- a) SPI – Serial Peripheral Interface.
- b) Point to many points.
- c) **SCLK: Serial Clock**

The purpose of the Serial Clock is to synchronise data being sent across the data lines.

MOSI: Master Out Slave In

The TX/Data Transmit line from the Master device to the Slave/Peripheral devices.

MISO: Master In Slave Out

The RX/Data Receive line from the Slave/Peripheral devices to the Master device.

SS1 and SS2: Slave Select 1/2

These lines are pulled low by the Master to signal to a specific Slave/Peripheral device that should start listening to data on its RX/MOSI line.

Question 2)

A)

- a) Inverting Amplifier.
- b) $Gain = -\frac{R_F}{R_1}$
- c) $-\frac{24K}{6K} = -4$
- d) $0.2V_p - p * -4 = -0.8V_p - p$
- e) Out of phase by 180 degrees.

B)

- a) Non-Inverting Amplifier.
- b) $Gain = 1 + \frac{R_F}{R_1}$
- c) $1 + \frac{24K}{6K} = 5$
- d) $0.11V_p - p * 5 = 0.55V_p - p$
- e) In Phase.

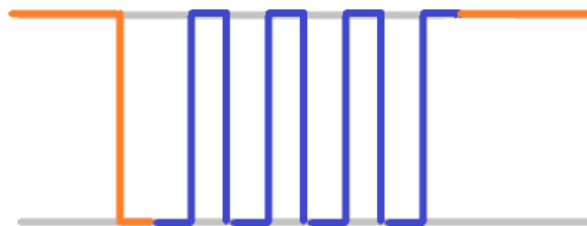
Question 3)

- a) RS232.
- b) Point to Point.
- c) Sending data to be displayed on a serial LCD.
- d) .

$0xAA = 0b10101010$

Inverted Endianness = 01010101

With Start and Stop bits = 0 01010101 1



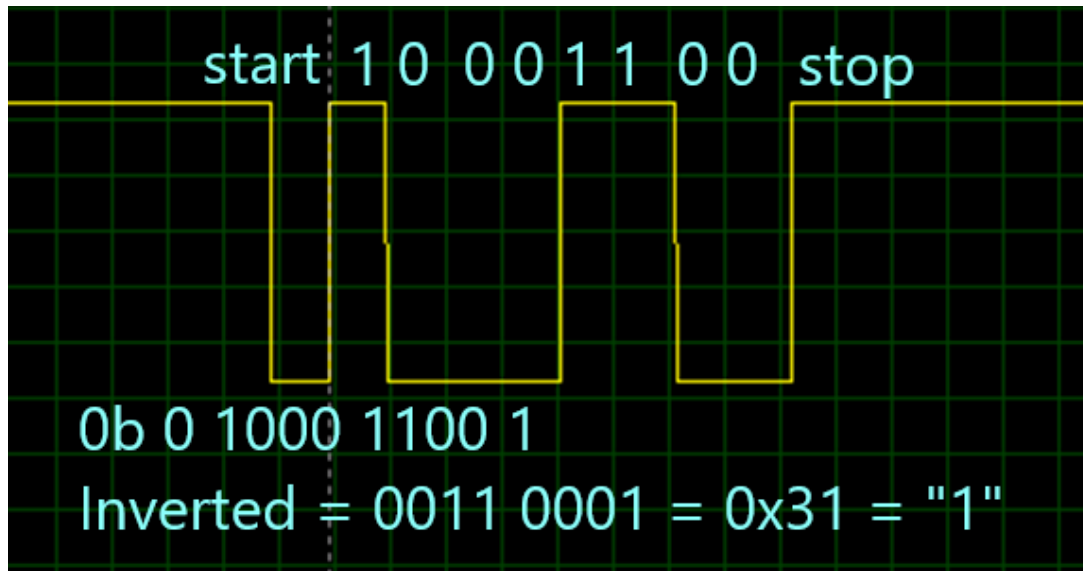
Question 4)

A)

a) Data excluding start and stop bits: 0b 0011 0001

0x31

b) 0x31 in ascii is "1"



B)

a) Data excluding start and stop bits: 0b 0010 0011

0x23

b) 0x23 in ascii is "#"

