

L4 Signals and Systems

Q1 A)

a) Inverting Amplifier

b) $\text{Gain} = -R_f/R_i$

c) $\text{Gain} = -R_f/R_i$

$$= -29k/2k$$

$$\text{Gain} = -14.5$$

d) $V_{out} = -\frac{R_f}{R_i} \times V_{in}$

$$= -\frac{29k}{2k} \times 0.365$$

$$V_{out} = -5.0025 \text{ V}$$

e) ~~180°~~ difference between phase of input and output is 180°

Q. B)

a) non-inverting amplifier

b) ~~Gain = 1 + R_f/R_i~~ Gain = 1 + R₁/R₂

c) ~~Gain = 1 + R_f/R_i~~ Gain = 1 + R₁/R₂

$$= 1 + 27k/2k$$

$$= 1 + 13.5k$$

$$\text{Gain} = 14.5$$

d) $V_{out} = 1 + \frac{R_1}{R_2} \times V_{in}$

$$= \left(1 + \frac{27k}{2k}\right) \times 0.62$$

$$= (1 + 13.5k) \times 0.62$$

$$= 8.37k \checkmark \quad 8.99k \checkmark$$

e) difference between the phase of the input and output 0°

Q2 A) ~~8bit 10000010~~

a) 8bit transmutation = 10000010

b) binary = 01000001

hex number = 41

ASCII table = A

Q2 B)

a) 8bit transmutation = 10101010

b) binary = 1010101

hex number = 55

ASCII table = u (capital u)

Q 3) a) I2C

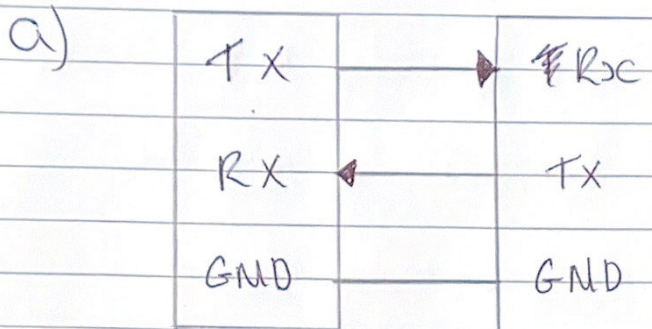
b) ~~Master-Slave Serial Communication~~
Synchronous

c) SDA = Serial Data which is
~~the clock line and used the~~
data line used in the I2C.

SCL = Serial Clock which is
the Clock line which is used
to Synchronize ~~any~~ all data
transmission over the I2C.

d) Serial Communication can
be found in an ethernet system
for data transfer.

Q4



b) RS232's classification is Synchronous and Asynchronous.

c) RS232 systems can be found within a personal Computer (PC) and its mouse and keyboard

d) 5A in binary = 1010110101

