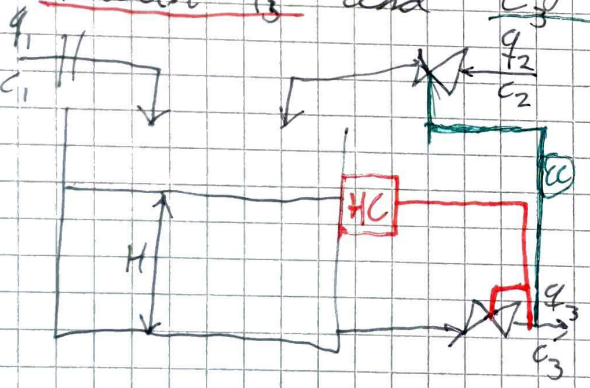
Exercise 5 | TKP4105 Håkon Viirik

1) MV: q_2, ~~q_1~~, q_3,
DV: q_1, c_1
CV: H, c_3

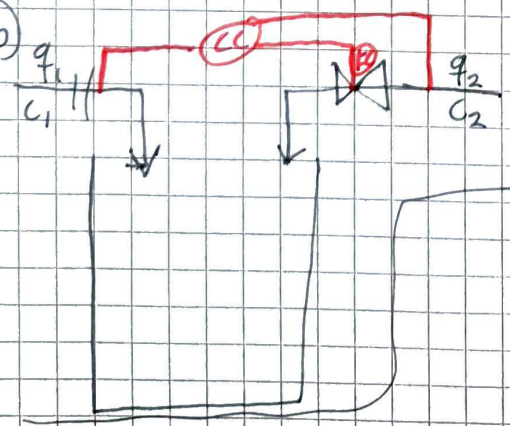
2)

	q_2	q_3	~~q_1~~
H	+	−	
c_3	−	0	

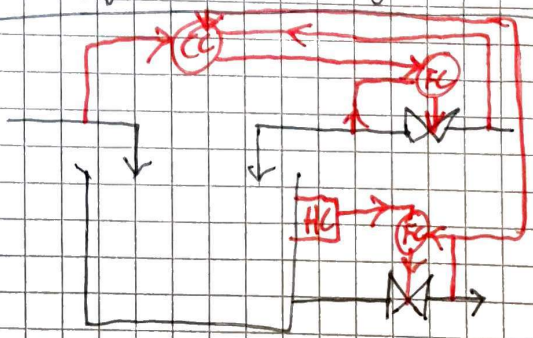
3) a) From the matrix we get that we controll H with q_3 and c_3 with q_2



b)



Compears the q_1/q_2 and regulatis the flow of q_2.



c) Cascade controll

(2) a) MV: $q_4, q_3, q_5, q_6, q_9, q_7, q_8$

b) DV: $q_1, c_1,$

c) CV: $T_{top}, c_2, h_1, h_2, c_3, h_3, P$

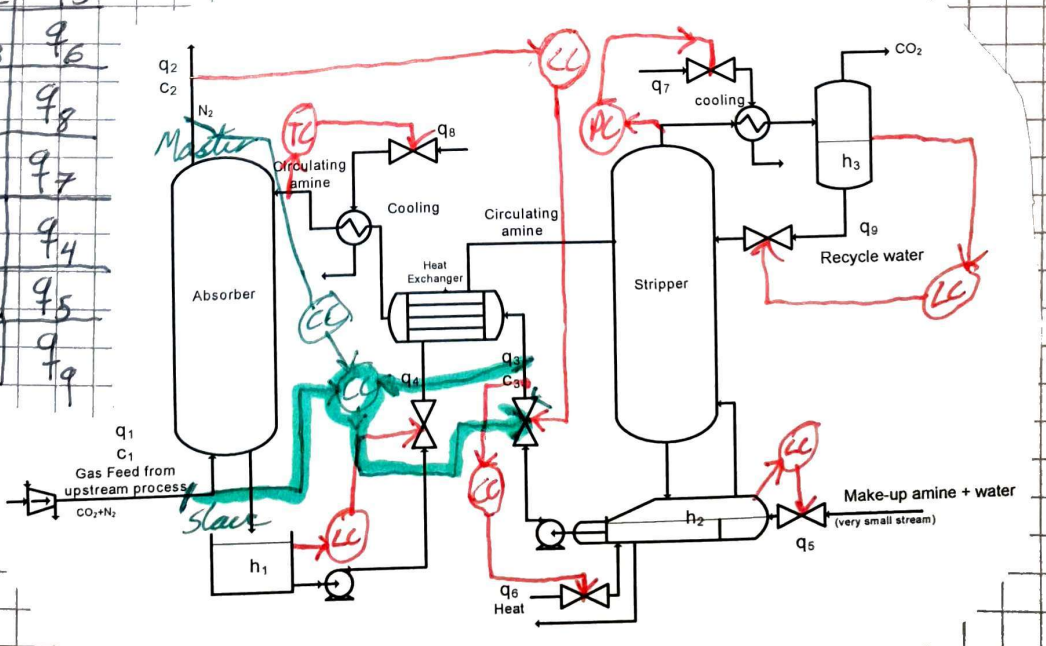
d) Setting up a control matrix

	q_4	q_3	q_5	q_6	q_9	q_7	q_8
T	0	0	0	+	0	0	−
P	0	0	0	0	0	−	0
c_2	0	−	0	0	0	0	0
c_3	0	0	−	−	0	0	0
h_1	+	−	+	0	+	0	0
h_2	+	−	+	0	+	0	0
h_3	0	0	0	0	−	0	0

This gives

X is controlled by

c_2	q_3
c_3	q_6
T	q_8
P	q_7
h_1	q_4
h_2	q_5
h_3	q_9



Figur 2. Anlegg for CO_2-fangst

e) • Cascade controll is when you have multiple messuring points and controllers controlling the same MV.
Often one slave controller and one master controller.
Where the task of the slave is to messure close to the MV so that a correction can be implemented fast.
While the master will overrun the slave if the masters messurment is wrong.

◦ See green pen mm

f) • Feedforward control is a strategy to reject disturbances before they can happen.

◦ See mm