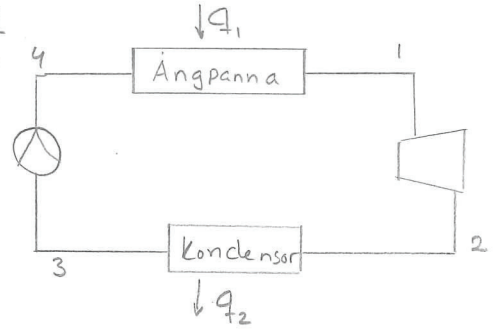
BE-1

a)



	T[°C]	P[bar]	H[kJ/kg]	s[kJ/kg·K]
1	195,04	14	2789,7	6,469
2'	30	0,0424	1954,7	6,469
2	30	0,0424		
3	30	0,0424	125,71	
4	30	14	125,71	

Turbin 1→2.

$T^{in} = 195,04°C$
$P^{in} = 14$ bar
$P^{ut} = 0,0424$ bar

$s = q s^V + (1-q) s^L$
$s^V = 8,452$ kJ/kg·K
$s^L = 0,437$ kJ/kg·K

$\Rightarrow q = \frac{s - s^L}{s^V - s^L} = 0,75 \Rightarrow$ Fukthalt 25 %

$H_2' = q H^V + (1-q) H^L = q \cdot 2556 + (1-q) \cdot 125,71 = 1954,7$ kJ/kg

Teoretisk termisk verkningsgrad: $\eta_t = \frac{q_1 + q_2'}{q_1}$

$q_1 = \{\text{Tillfört värme}\} = (H_1 - H_4)\dot{m} = 2663,99\dot{m}$ kJ/kg

$q_2' = \{\text{Bortförd värme}\} = -(H_3 - H_2')\dot{m} = -1828,99\,\dot{m}$ kJ/kg

$\Rightarrow \eta_t = \frac{2663,99 - 1828,99}{2663,99} = 0,31$

Svar | Fukthalt: 25 %
Teoretisk η_t: 31 %

b)

$P_1 = P_4 = 14$ bar
$P_2 = P_3 = 0,0424$ bar

$T_1 = 400°C \Rightarrow s_1 = 7,301$ kJ/kg·K $= s_2'$

$\Rightarrow q = \frac{7,301 - 0,437}{8,452 - 0,437} = 0,86 \Rightarrow$ Fukthalt 14 %

$H_2' = q \cdot 2556 + (1-q) \cdot 125,71 = 2206,996$ kJ/kg

$H_3 = H_4 = H^L(30°C) = 125,71$ kJ/kg

$H_1 = H^V(14\text{ bar}, 400°C) = 3256$ kJ/kg

$\Rightarrow \eta_t = \frac{(H_1 - H_4) - (H_3 - H_2')}{(H_1 - H_4)} = 0,34$

Svar | Fukthalt: 14 %
Teoretisk η_t: 34 %