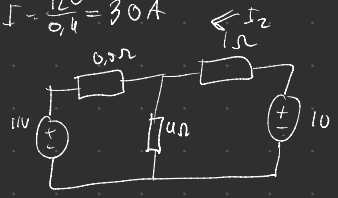
① a) $P = \frac{U^2}{R} = \frac{12^2}{4} = 36\ W$

b) $R_{tot} = \frac{4}{10} = 0,4\ \Omega$

$I = \frac{12V}{0,4} = 30A$

c) 

$R_{11} = 0,8\Omega + \frac{1,4}{1+4} = 1,3$

$I_{11} = \frac{11}{1,3} = 8,46$

$I_4 = 8,46 \cdot \frac{1}{5} = 1,7$

$R_{10} = 1 + \frac{4 \cdot 05}{45} = 1,44$

$I_{10} = \frac{10}{1,44} = 6,9$

$I_4 = 6,9 \cdot \frac{05}{45} = 0,76$

$I_{tot} = 0,76 + 1,7 = 2,46$

d) $I_{11} = 8,46 \cdot \frac{4}{5} = 6,8$

$6,9 > 6,8$ blir utladet

e) $\frac{3 \cdot 6}{2+6} = \frac{24}{12} = 2$ $R_{tot} = 2+2 = 4$

$R_1 = 2$ $R_2 = 3$ $R_3 = 6$

f) $E = \frac{1}{2} C V^2 = \frac{1}{2} \cdot 2000 \cdot 12^2 = 144000\ J$

$E = \frac{144000}{3600 \cdot 10^3} = 0,04\ kWh$

g) $v(0) = 12$ $RC = 2000 \cdot 4 = 8000$

$v(\infty) = 0$

$v(t) = 12e^{-\frac{t}{8000}}$

$12e^{-\frac{t}{8000}} = 10$

$t = -8000 \cdot \ln\left(\frac{10}{12}\right) = 1459s \rightarrow \frac{1459}{60} = 24 min$

h)

$P = 12 \cdot 50 = 600W$

② a) N → 0 → 24 = 5 bit/s
M → 0 → 40 = 6 bit/s

b) Orker ikke

c) gjør X bar

③ a) $V_0 = 1A \cdot 2\Omega = 2V$

b) $\frac{10V}{1000\Omega} = 10mA$

$\frac{2V}{10mA} = 200\Omega$