Circuit Theory 1

Homework 1

Student Name : Barış
Student Surname : Karapelit
Student Number : 21707346

1)A stove element draws 10 A when connected to a 240-V line. How long does it take to consume 120 kJ? (explain)

Answer 1 :

Amper= 10A

Voltage = 240 V

Energy = 120 kj

t=?

P= V x I

P = 240 X 10 = 2400

E = P x t

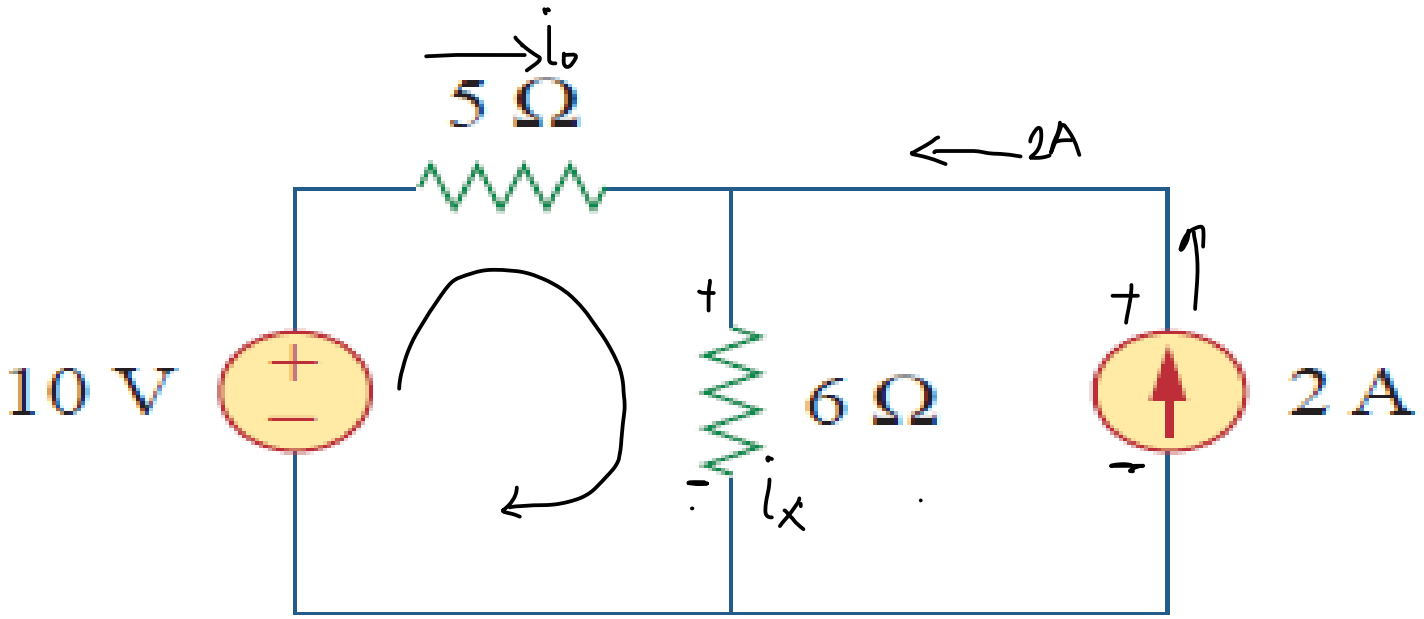
120 X 1000 = 2400 x t

120.000 = 2400 x t

T = 50 second

2)Calculate the power supplied or absorbed by each element.

Answer 2:



KCL => $\dot{I}_O + 2A = \dot{I}_X$

KCL => $10V - \dot{I}_0.5 - 6.\dot{I}_X = 0$

$=10V - 5\dot{I}_0 - 6[2 + \dot{I}_O] = 0$

$=10V - 5\dot{I}_0 - 12 - 6\dot{I}_0 = 0$

$11\dot{I}_0 = -2$

$\dot{I}_0 = -2/11$

P=I.V

$V_{AK} = V_X - V_Y = 6x\ (20/11) = 120/11$

$P_P = V_{AK}.\dot{I}_A = 2.\ (120/11) = 240/11 = 21.818$ W

$P_{10V} = (-2/11).10 = -20/11 = -1.81$

$P_{Production} - P_{Consumption} = 0$

That's why it's negative.

$P_{10\Omega} = i^2.R = ((-2/11).A)^2.5 = -20/121 = -0.16$

$P_{50\ \Omega} = i^2.R = ((20/11)^2.6) = -2400/121 = -19.8$

-1.81 -0.16-19.8 = -21.818

$P_P = P_C$