CODE NO:- Z-079
FACULTY OF ENGINEERING
F.E Year Examination - June– 2015
Elements of Electrical Engineering
(Revised)

[Time: Two *Hours*]   [Max. Marks: 40]

"Please check whether you have got the right question paper."
i)   Question. No. 1 is compulsory.
ii) Attempt <u>any two</u> questions from remaining questions
iii) Assume suitable data if necessary
iv) Figures to the right indicate full marks

Q.1   Solve <u>any five</u> questions   10
1) State the factors affecting the value of resistance. State the effect of temperature on resistance of 1) gold 2) Rubber
2) Define RTC. Prove, $\alpha_o = \frac{Rt - R_o}{R_o t}$
3) Define self inductance and mutual inductance
4) Write the equations for current and voltage during discharging. Draw the curves w.r.t. time
5) Define MMF, magnetic flux, Reluctance
6) Give four similarities between magnetic and electric circuits
7) State superposition theorem
8) Define time constant of charging circuit

Q.2   a)   05
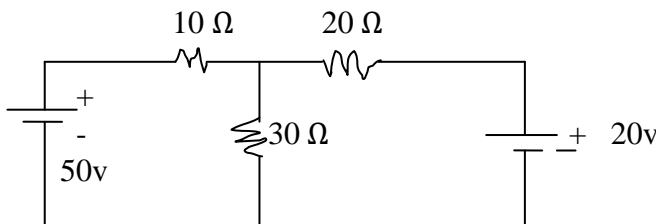
Find current through 30Ω resistance using Thevenin's theorem.
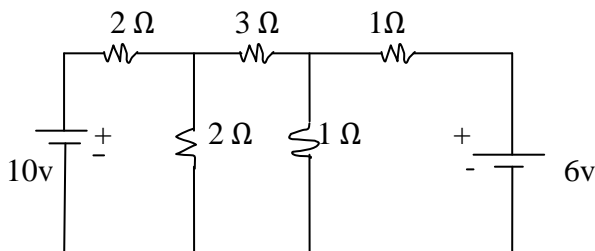   b)   05
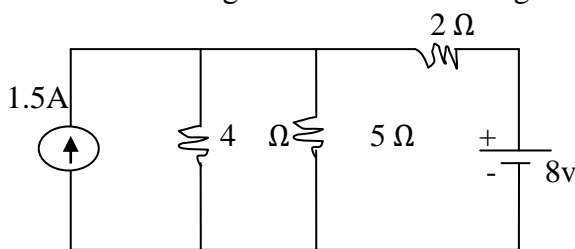
Find current through 5Ω resistance using superposition theorem
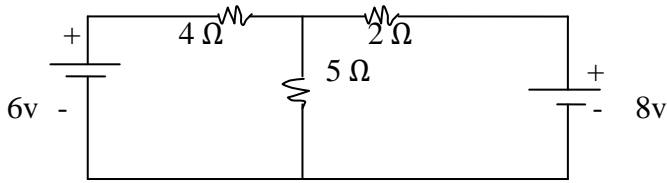   c)   State and explain maximum power transfer theorem   05

Q.3   a)   05

Find current through 3Ω resistance using Loop analysis

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b)   05

Find current through 5Ω using Nodal analysis

c) State and explain Thevenin's theorem   05

Q.4 a) Define R.T.C state, it's unit. if α_1 and α_2 are R.T.C. at $t_1^0 c$ and $t_2^0 c$ respectively then prove   05

$$\alpha_2 = \frac{\alpha_1}{1 + \alpha_1(t_2 - t_1)}$$

b) State and explain in brief the concept of self induction   05

c) With neat ckt diag and waveforms explain the charging process of capacitor. Derive the equations for   05
charging voltage, current & charge

Q.5 a) Give the comparison of electric and magnetic circuit   05

b) Explain hysteresis and eddy current loss   05

c) A mild steel ring of 30cm mean circumference has a cross sectional area of 6cm^2 is wound by a 500   05
turns coil. The ring is cut with 1mm air gap. 4A current in the winding produces flux density of 1T in
the air gap. Find relative permeability of mild steel neglect leakage 'fringing'