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CODE NO:- K-72

FACULTY OF ENGINEERING

F.E Examination

June 2014

Elements of Electrical Engineering

[Time: Two Hours]

[Max. Marks:40]

“Please check whether you have got the right question paper.”

N.B

- i) Q .no. 1 are compulsory.
- ii) Attempt any two questions from the remaining questions.
- iii) Assume suitable data, if necessary.

Q.1 Solve any five. 10

- a) State the effect of temperature on
 - i) Carbon
 - ii) Copper
- b) Define Temperature Coefficient of resistance.
- c) State Thevenin’s Theorem.
- d) Define time constant of RC circuit
- e) Draw the curve for capacitor voltage during discharging & define time constant.
- f) Define mutual Inductance.
- g) Define MMF, magnetic flux & reluctance
- h) What is eddy current loss?

Q. 2 a) If α_1 and α_2 are temperature coefficients of resistance at $t_1^{\circ}C$ & $t_2^{\circ}C$ respectively ,prove that $\frac{1}{\alpha_2} - \frac{1}{\alpha_1} = (t_2 - t_1)$ 05

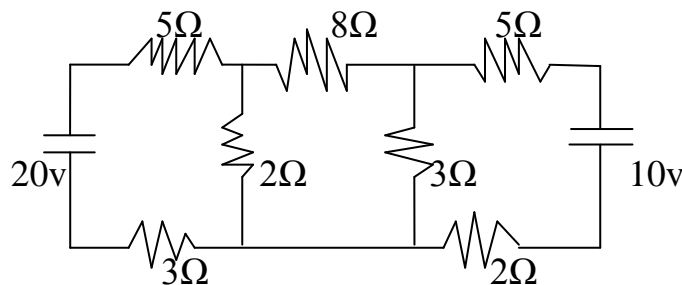
b) State and explain with neat diagram the concept of Mutual Inductance 05

c) A 200 V dc supply is suddenly applied to a series combination of $5\mu f$ capacitor and $1 M\Omega$ resistor. Calculate 05

- 1) Time taken by capacitor to rise it’s voltage up to 150V.
- 2) The current through and P.D. across the capacitor 5 sec after it is connected to supply.

Q. 3 a) State and explain superposition theorem. 05

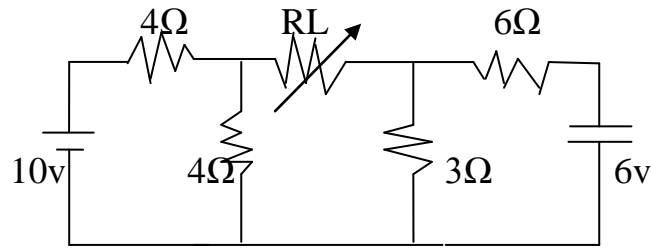
b) 05



Find current through 8Ω resistance using loop analysis.

c)

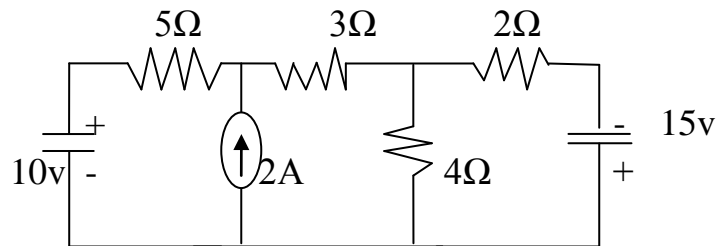
05



Find R_L such that maximum power transferred to it. Also find maximum power transferred.

Q. 4 a)

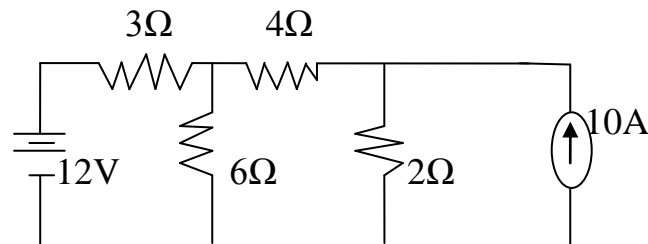
05



Find current through 3Ω resistance using Nodal Analysis.

b)

05



Using Thevenin's Theorem find the current through 4Ω resistor.

c) State and explain maximum power transfer theorem. 05

Q. 5 a) Explain the phenomenon of hysteresis loss & eddy current loss. 05

b) Explain with neat diagram what is useful flux, leakage flux, fringing & its effect on magnetic flux density. 05

c) A mild steel ring has a mean circumference of 600 mm and uniform cross section area of 200 mm^2 . Permeability of the ring is 1200 calculate 05

1) MMF required to produce flux of $200 \mu\text{Wb}$

2) If an air gap of 1mm is cut in the ring find flux produced in the gap if MMF remains same.