



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND SEMESTER EXAMINATION FOR
DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING
CERTIFICATE IN ELECTRICAL AND ELECTRONICS

EED 211: ELECTRICAL PRINCIPLES IV
EPC 216:

DATE: 11/8/2016

TIME: 2:00 – 4:00 pm

INSTRUCTIONS

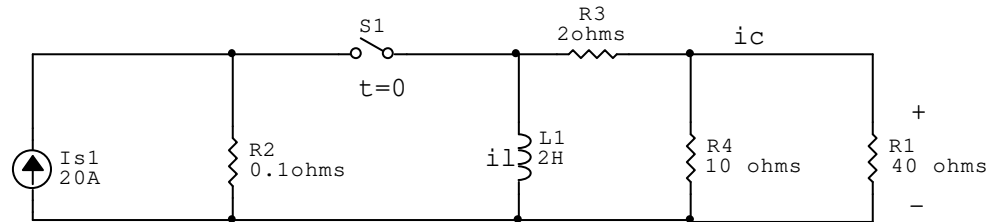
Answer Question One And Any Other Two Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- (a) A resistance of 1000Ω is connected in series with a $2\mu\text{f}$ capacitor. calculate the value of charging current and capacitor voltage at $t=0$ and $t=2\text{msec}$ from the instant the circuit is switched on to a 10volts battery (10 marks)
- b) A series circuit consisting of a resistance of 100 ohms and inductance of 4H is connected in to a 10 V battery. calculate (i) instantaneous value of current at 5 millisecond
- (ii) time constant
- (iii) find the voltage across the inductance at time $t=\tau$ and $t=5\tau$ (15 marks)
- (c) Explain the difference between steady state and transient responses of a network (5 marks)

QUESTION TWO

For the circuit below, find the expression of $i_o(t)$ and $V_o(t)$. The switch was closed for a long time and at $t=0$, the switch was opened.



(20 marks)

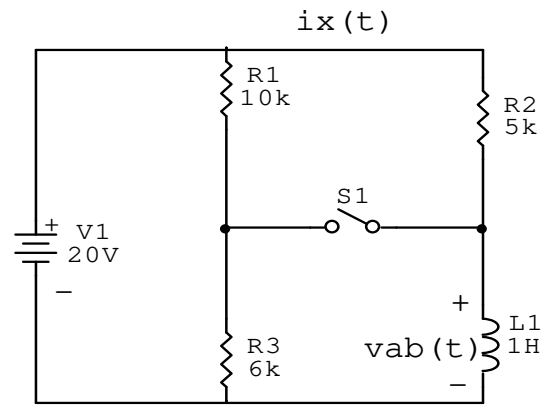
QUESTION THREE

A star connected 3 phase load has a resistance of 6Ω and an inductive reactance of 8Ω in each branch. The line voltage is 220 volts. Determine the phasor expressions for voltages across each branch, line voltages and line currents. Calculate the total power. (20 marks)

QUESTION FOUR

For the circuit shown below, the switch 's' has been closed for a long time and then opens at $t=0$. Find

- (i) $V_{ab}(0^-)$
- (ii) $i_x(0^-)$
- (iii) $i_x(0^+)$
- (iv) $V_{ab}(0^+)$
- (v) $i_x(t=\infty)$
- (vi) $V_{ab}(t=\infty)$
- (vii) $i_x(t)$ for $t>0$



(20 marks)

QUESTION FIVE

A star connected 3 phase load has a resistance of 6Ω and an inductive reactance of 8Ω in each branch. the line voltage is 220 volts. Determine the phasor expressions for voltages across each branch, line voltages and line currents. Calculate the total power. (20 marks)