



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2017/2018**

COURSE NAME : ELECTRIC CIRCUIT ANALYSIS I
COURSE CODE : BEF12403
PROGRAMME CODE : BEV
EXAMINATION DATE : JUNE/JULY 2018
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

- Q1** Differentiate the following concepts. Use an appropriate diagram or equation to support your explanation.
- (a) Conductor, insulator and semiconductor. (6 marks)
- (b) Branches, nodes and loops. (6 marks)
- Q2** In a two-terminal device, a current $i(t) = 20 \cos 100\pi t$ mA enters the first terminal.
- (a) Calculate the amount of current which enters that terminal in the time interval $-10 \leq t \leq 20$ ms. (4 marks)
- (b) Identify the current at $t = 40$ ms. (2 marks)
- (c) Calculate the charge q at $t = 40$ ms given that $q(0) = 0$. (4 marks)
- Q3** (a) Compute the value of I_1 , I_2 and I_3 for the circuit in **Figure Q3(a)**. (15 marks)
- (b) Identify a set of procedures to analyse any linear circuit. (5 marks)
- Q4** (a) Prove that $V_o = 15$ V for the circuit in **Figure Q4(a)**, by using nodal analysis. (10 marks)
- (b) Calculate the voltage at terminals a and b for the circuit in **Figure Q4(b)** by using mesh analysis. (10 marks)

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- Q5** The variable resistor, R_{LOAD} in the circuit of **Figure Q5** is adjusted to achieve maximum power transfer to R_{LOAD} .
- (a) Calculate the value of R_{LOAD} that should be adjusted to absorb maximum power.
(17 marks)
- (b) Find the maximum power transferred and absorbed by R_{LOAD} .
(3 marks)
- Q6** (a) A circuit consisting of three resistances; $12\ \Omega$, $18\ \Omega$ and $36\ \Omega$ respectively, joined in parallel, are connected in series with a fourth resistance, R . The circuit is supplied with $60\ \text{V}$ and it is found that the power dissipated in the $12\ \Omega$ resistance is $36\ \text{watt}$. Determine the value of R and the total power dissipated by the resistors.
(10 marks)
- (b) Determine the total resistance for the circuit in **Figure Q6(b)** at a – b terminals.
(8 marks)

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- END OF QUESTIONS -

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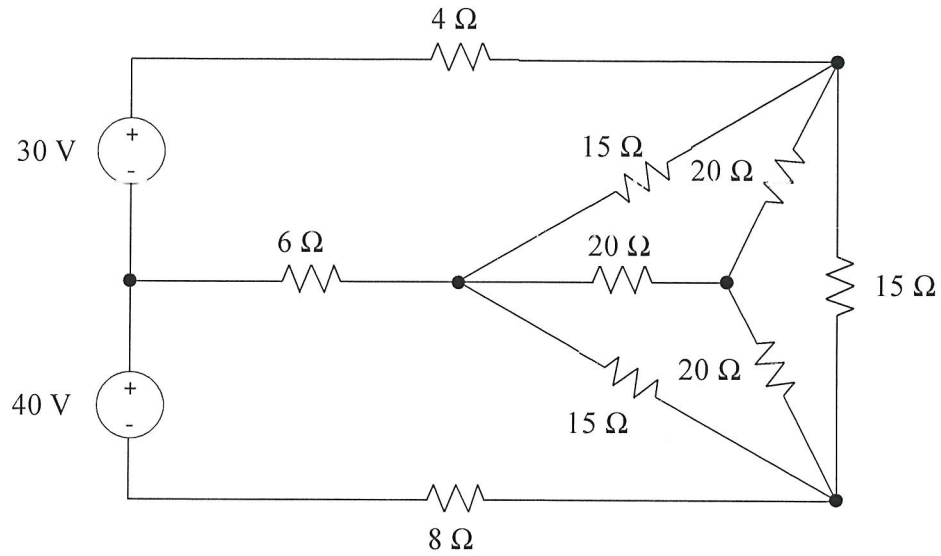


Figure Q3(a)

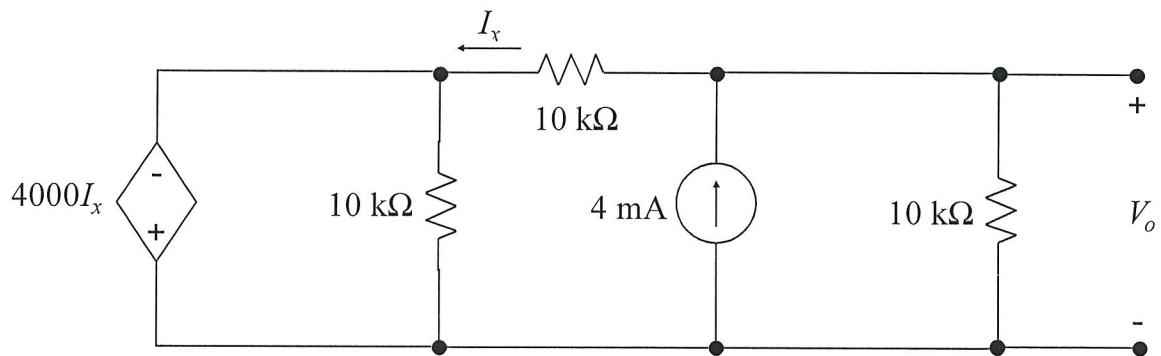


Figure Q4(a)

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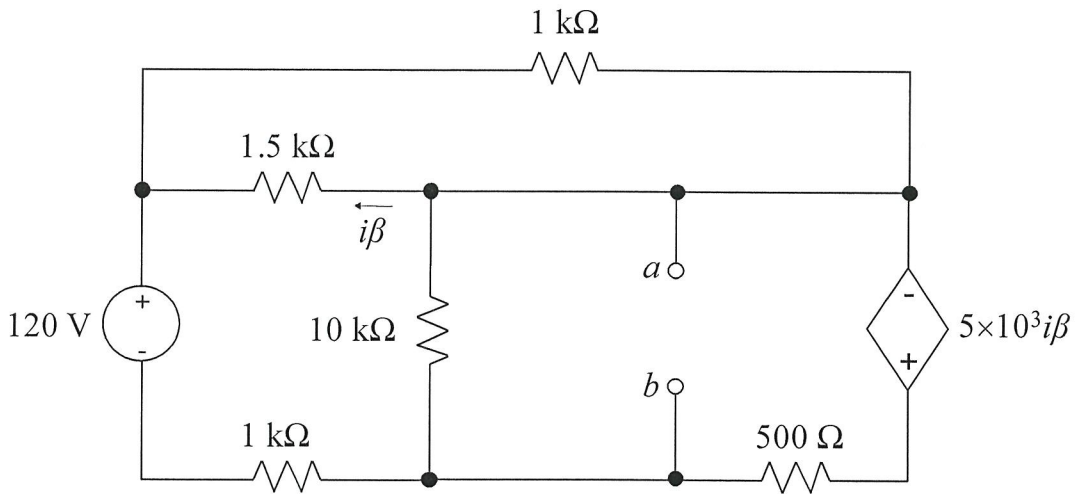


Figure Q4(b)

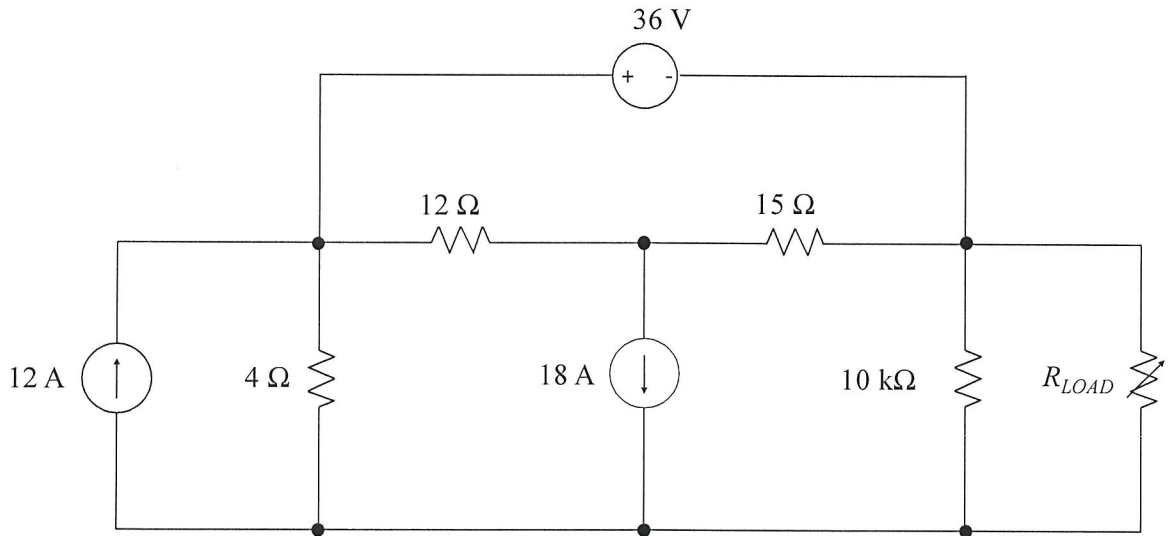


Figure Q5

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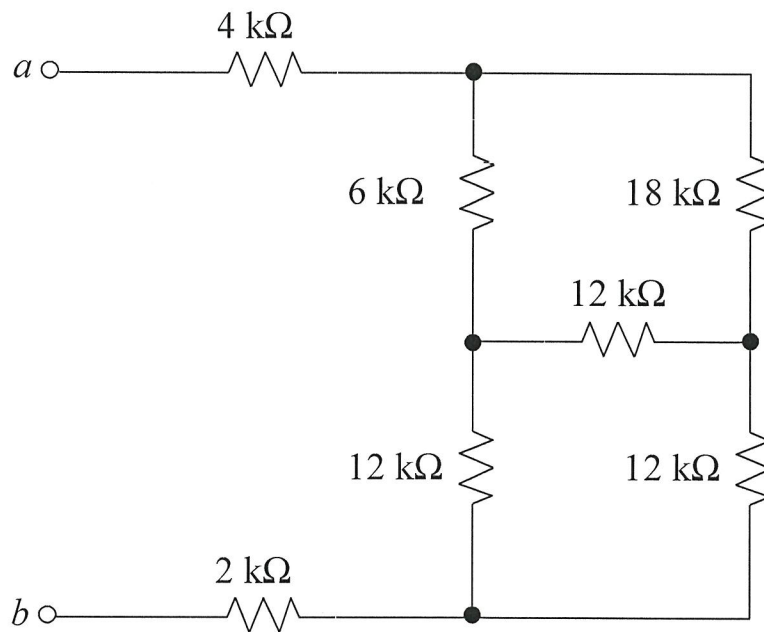


Figure Q6(b)

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