Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2022/2023

COURSE NAME	:	ELECTRIC CIRCUIT 1
COURSE CODE	:	BEV 10303
PROGRAMME CODE	:	BEV
EXAMINATION DATE	:	JULY/ AUGUST 2023
DURATION	:	3 HOURS
INSTRUCTION	:	1. ANSWER ALL QUESTIONS 2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK.** 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1 (a) Define the following terms

(8 marks)

(i) Ohm's law.

(ii) Branch.

(iii) Loop.

(iv) Node.

(b) Analyze how many branches, nodes, and elements are in series and in parallel with the circuit (see **Figure Q1 (b)**).

(4 marks)

(c) Suppose it is more convenient to work with a Wye network in a place where the circuit contains a delta configuration. Show Delta to Wye conversion.

(13 marks)

Q2 (a) By using mesh analysis, solve to find the current I_0 in the circuit (see **Figure Q2(a)**).

(13 marks)

(b) By using nodal analysis, solve the nodal voltages in the circuit (see **Figure Q2(b)**).

(12 marks)

Q3 (a) Use the superposition theorem, to identify the current *i* in the circuit (see **Figure Q3 (a)**).

(12 marks)

(b) Solve the given circuit (see **Figure Q3 (b)**) for the Thevenin equivalent circuit, to the left of the terminals a-b. Then find the current through R_L= 6 Ω, 16 Ω, and 36Ω.

(13 marks)

Q4 (a) Define the instantaneous current.

(4 marks)

(b) Define the instantaneous voltage.

(4 marks)

(c) Recall instantaneous power p(t).

(3 marks)

(d) Differentiate how resistive load and reactive load absorbing the power.

(2 marks)

(e) Identify the average power supplied by the source and the average power absorbed by the resistor (see **Figure Q4(e)**.

(12 marks)

-END OF QUESTIONS –

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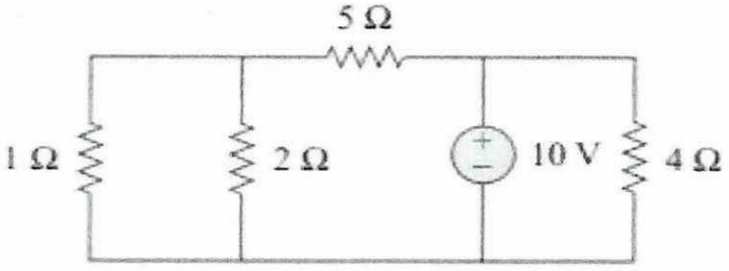

Figure Q1(b)

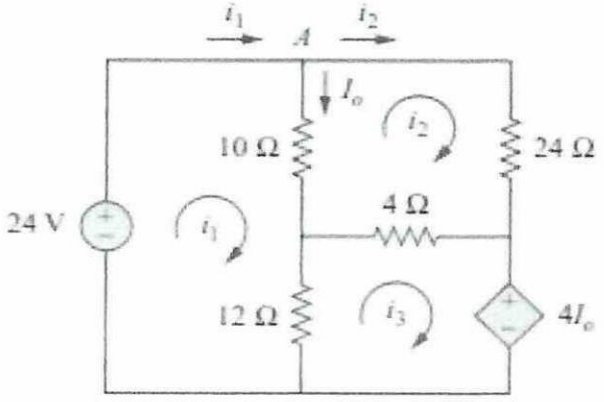

Figure Q2(a)

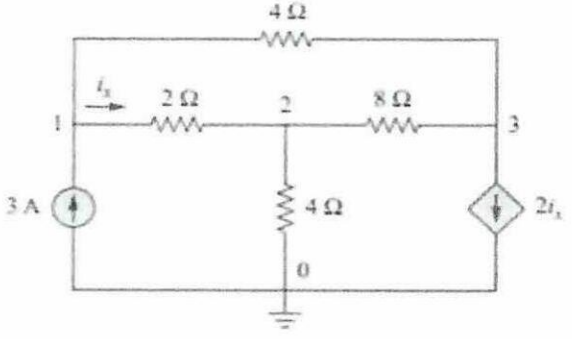

Figure Q2(b)

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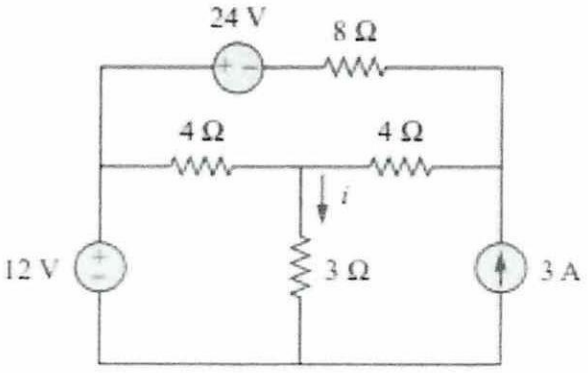

Figure Q3(a)

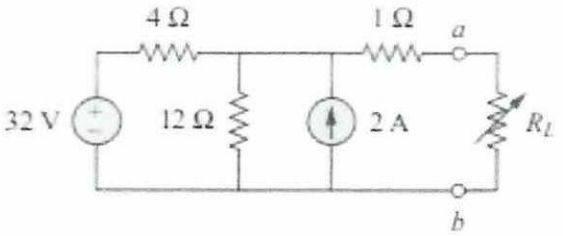

Figure Q3(b)

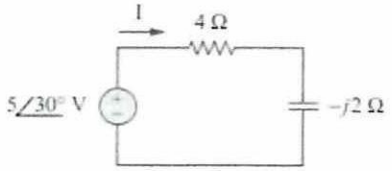

Figure Q4(e)