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CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION

SEPTEMBER 2014 SESSION

SUBJECT CODE	:	**FED10103**
SUBJECT TITLE	:	**ELECTRICAL FUNDAMENTAL**
LEVEL	:	**DIPLOMA**
TIME / DURATION	:	**9.00 AM – 12.00 PM (3 HOURS)**
DATE	:	**30 DECEMBER 2014**

INSTRUCTIONS TO CANDIDATE

1. **Please read the instructions given in the question paper CAREFULLY.**
2. **This question paper is printed on both sides of the paper.**
3. **Please write your answers on the answer booklet provided.**
4. **Answers should be written in blue or black ink except for sketching, graphic and illustration.**
5. **This question paper consists of TWO (2) sections. Section A and B. Answer all questions in Section A. For Section B, answer two (2) questions only.**
6. **Answer all questions in English.**

THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.

Question 1

(a) State three (3) characteristics of a series circuit (3 marks)

(b) State three (3) characteristics of a parallel circuit (3 marks)

(c) Explain briefly Kirchhoff's voltage law (KVL) and Kirchhoff's current law (KCL) (4 marks)

(d) Define voltage, current, power and state their symbols and units (6 marks)

Question 2

A student plots data, voltage (*V)* versus current (*I*) to determine the unknown value of the resistor in a series circuit and fits the straight line plot shown in Figure 1. From the plot, determine the resistance, R (Ω) and the conductance, G (Siemens) of the resistor. Round the answer to one (1) decimal point. State its 4-band color code.

(8 marks)

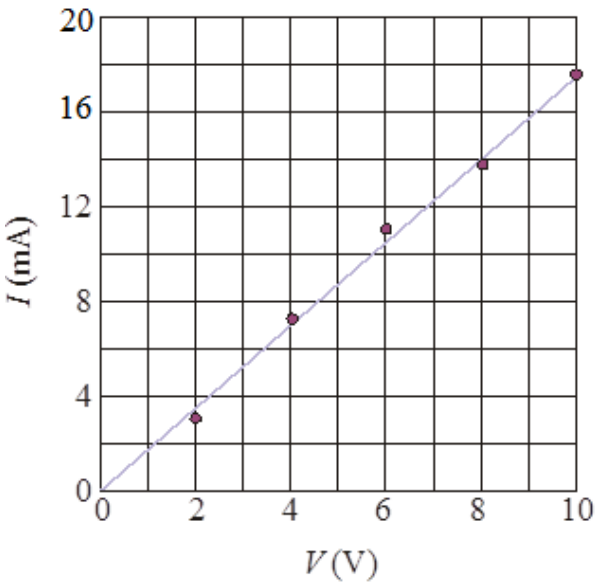

Figure 1

Question 3

Based on circuit of Figure 2, calculate:

(a) the currents i_1, i_2, i_3, i_4 (8 marks)

(b) the voltage drop across resistors $20\,\Omega$ and $40\,\Omega$ (4 marks)

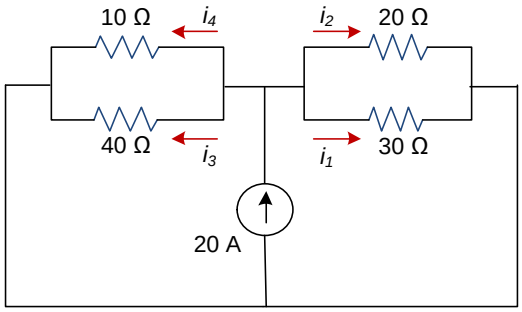

Figure 2

Question 4

Figure 3 shows a series-parallel circuit. Determine:

(a) The equivalent resistance of the circuit (5 marks)

(b) The total current (3 marks)

(c) The current on each resistor (8 marks)

(d) The power dissipated on each resistor (8 marks)

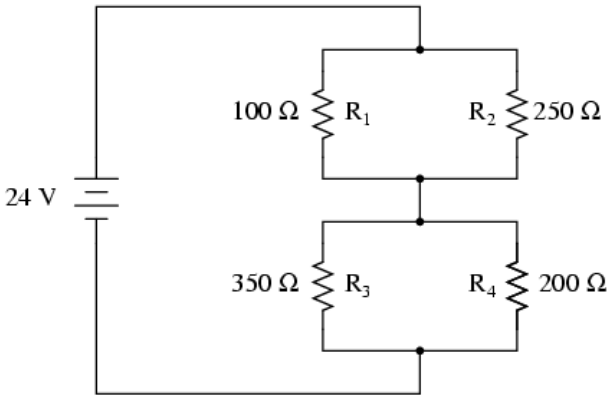

Figure 3

SECTION B (Total: 40 marks)

INSTRUCTION: Answer only TWO (2) questions
Please use the answer booklet provided.

Question 5

By using Thevenin's theorem for the circuit shown in Figure 4,

(a) Determine resistor (R_L) that will result in maximum power delivered to the load (10 marks)

(b) Draw the Thevenin's equivalent circuit (5 marks)

(c) Calculate the maximum power transfer (5 marks)

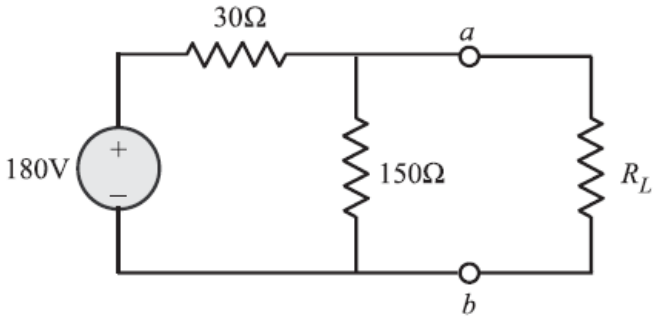

Figure 4

Question 6

By using the mesh analysis on Figure 5:

(a) Determine the current through the $8\ \Omega$ resistor. Indicate the current direction. (7 marks)

(b) Determine the voltage, V_0 (3 marks)

(c) Verify your answer in (a) and (b) by using nodal analysis method. (10 marks)

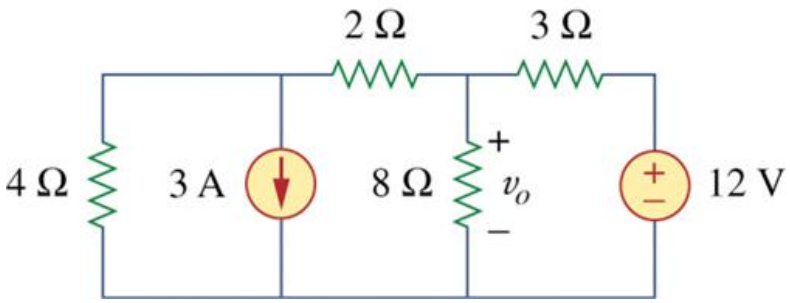

Figure 5

Question 7

Based on circuit of Figure 6,

(a) Use the superposition theorem to solve for current *i*, current i_1, *and* voltage drop across resistor $R = 2\Omega$ (15 marks)

(b) By using the source transformation method, verify the answer determine in (a) (5 marks)

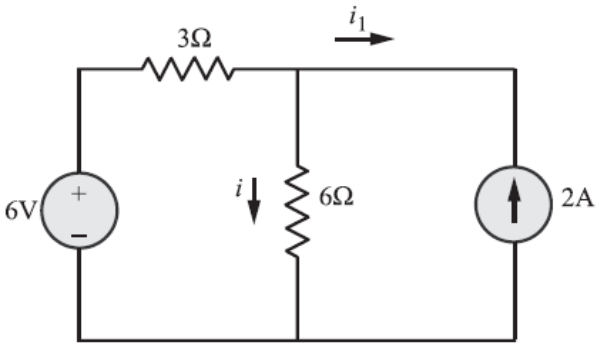

Figure 6

END OF QUESTION PAPER