CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
SEPTEMBER 2013 SESSION

SUBJECT CODE	:	**FED 10103**
SUBJECT TITLE	:	**ELECTRICAL FUNDAMENTAL**
LEVEL	:	**DIPLOMA**
TIME / DURATION	:	**2.5 HOURS**
DATE	:	

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 5 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

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

Question 1

(a) Identify the four-band color code of the following resistors

No.	Value
1	$3.3 \times 10^3\ \Omega \pm 10\%$
2	$100\ \Omega \pm 5\%$
3	$88\ M\Omega \pm 10\%$

(6 marks)

(b) Explain briefly Kirchhoff's voltage law (KVL) and Kirchhoff's current law (KCL) (6 marks)

(c) Define voltage, *V* and current, *I*, and state their units (6 marks)

Question 2

In **Figure 1**, determine the equivalent resistance, R_{eq} seen by the current source 10A, the current, *I* and the voltage, *V*.

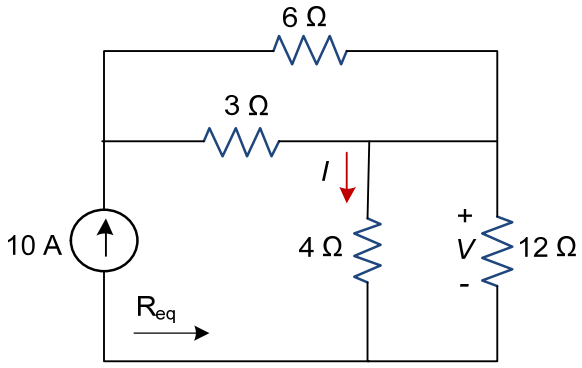

Figure 1

(10 marks)

Question 3

Based on the circuit shown in **Figure 2**, fill up **Table 1** with the related values of voltage, current, resistance, and power dissipated. Show all your works. (**Submit this page**).

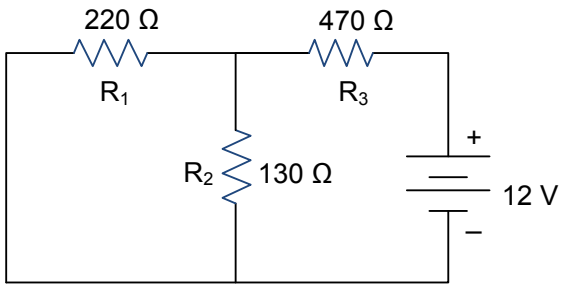

Figure 2

Table 1

	R_1	R_2	R_3	TOTAL
Voltage, V				
Current, I				
Resistor, R	**220 Ω**	**130 Ω**	**470 Ω**	
Power, P				

(16 marks)

Question 4

Apply the superposition theorem on **Figure 3** and determine the voltage, *v* and the current through resistor $4\,k\Omega$. Indicate the current direction.

(16 marks)

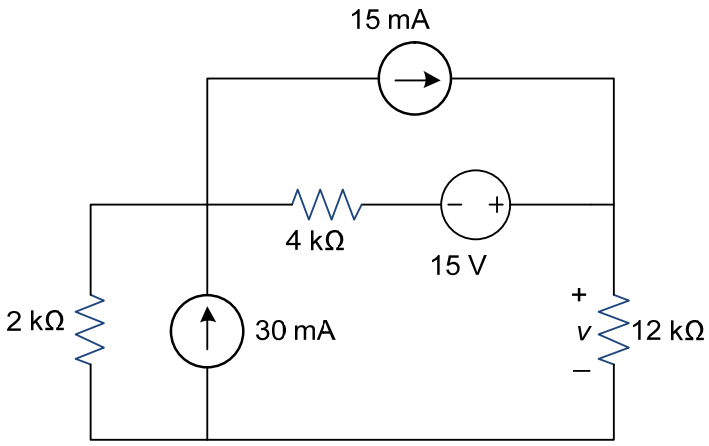

Figure 3

SECTION B (Total: 40 marks)

INSTRUCTION: Answer only TWO (2) questions

Please use the answer booklet provided.

Question 5

Based on the circuit in **Figure 4**, determine:

(a) the Thevenin equivalent at the terminal of resistor *R* so that the maximum power is transferred (12 marks)

(b) the relationship between *R* and Thevenin resistance, R_{TH} (3 marks)

(c) the maximum power transferred to resistor, *R* (5 marks)

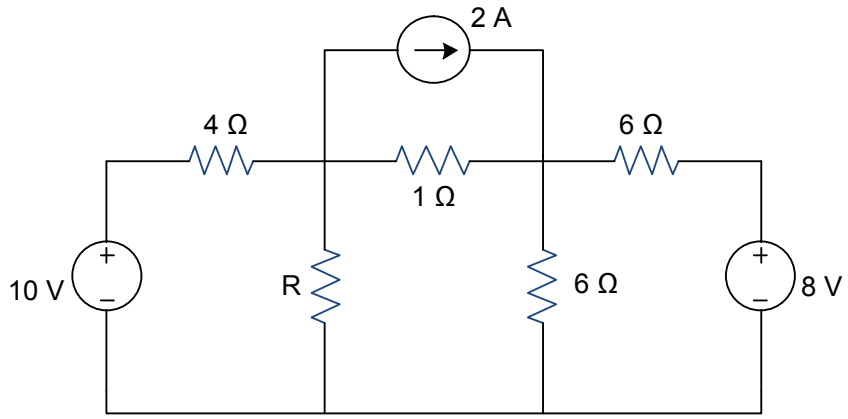

Figure 4

Question 6

Based on **Figure 5**, determine:

(a) the current, i_x using nodal analysis. (14 marks)

(b) the power supplied by the 4A current source (6 marks)

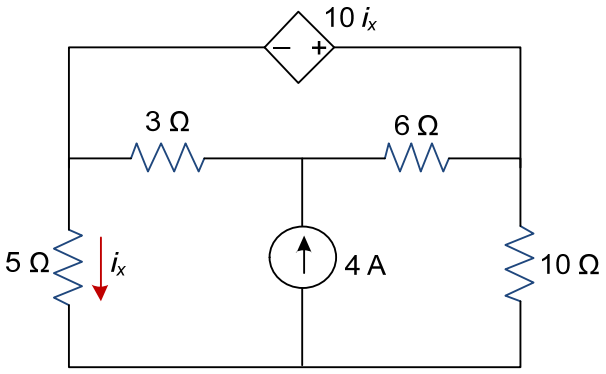

Figure 5

Question 7

By using mesh analysis on **Figure 6**, determine:

(a) the voltage, V_x (15 marks)

(b) the current through the resistor $10\,\Omega$ (magnitude and direction) (5 marks)

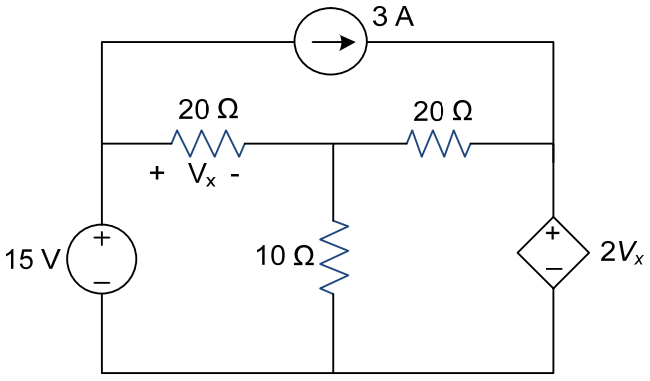

Figure 6

END OF QUESTION PAPER