



**UNIVERSITI KUALA LUMPUR  
Malaysia France Institute**

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**FINAL EXAMINATION  
JULY 2010 SESSION**

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**SUBJECT CODE** : FED 10102  
**SUBJECT TITLE** : ELECTRICAL FUNDAMENTAL  
**LEVEL** : DIPLOMA  
**TIME / DURATION** : 8.00 pm – 10.00 pm  
(2 HOURS)  
**DATE** : 15 NOVEMBER 2010

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**INSTRUCTIONS TO CANDIDATES**

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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. Answer 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.
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**THERE ARE 6 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.**

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**SECTION A (Total: 60 marks)**

**INSTRUCTION: Answer ALL questions**

**Please use the answer booklet provided.**

**Question 1**

a) Identify the color code of the following resistors

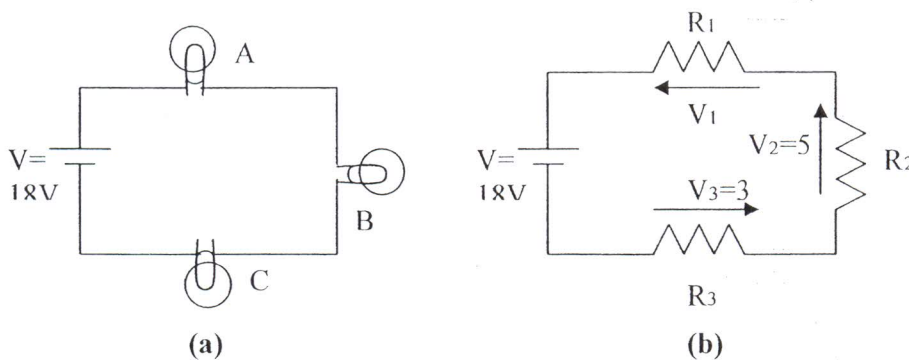
Value	1 <sup>st</sup> band	2 <sup>nd</sup> band	3 <sup>rd</sup> band	4 <sup>th</sup> band
$1.5 \times 10^3 \Omega \pm 10\%$				
$3.3 \times 10^6 \Omega \pm 5\%$				
$51 \text{ k}\Omega \pm 10\%$				
$79 \text{ M}\Omega \pm 10\%$				

(8 marks)

b) Three lamps A, B and C as shown in **Figure 1(a)** are connected in series across a 18V supply. Lamp A has an internal resistance  $R_1$ , lamp B has an internal resistance  $R_2$  and lamp C has an internal resistance  $R_3$  as shown in **Figure 1(b)**. If the total resistance is  $36\Omega$ , voltage drop across  $R_2$  is  $V_2 = 5\text{V}$  and voltage drop across  $R_3$  is  $V_3 = 3\text{V}$ , determine:

- i. the voltage drops across  $R_1$
- ii. the supply current,  $I$
- iii. the value of resistors  $R_1$ ,  $R_2$  and  $R_3$ .

(12 marks)



**Figure1**

Question 2

Determine the total current from the source and the current through each resistor for each position of the ganged switch in **Figure 2**

(20 marks)

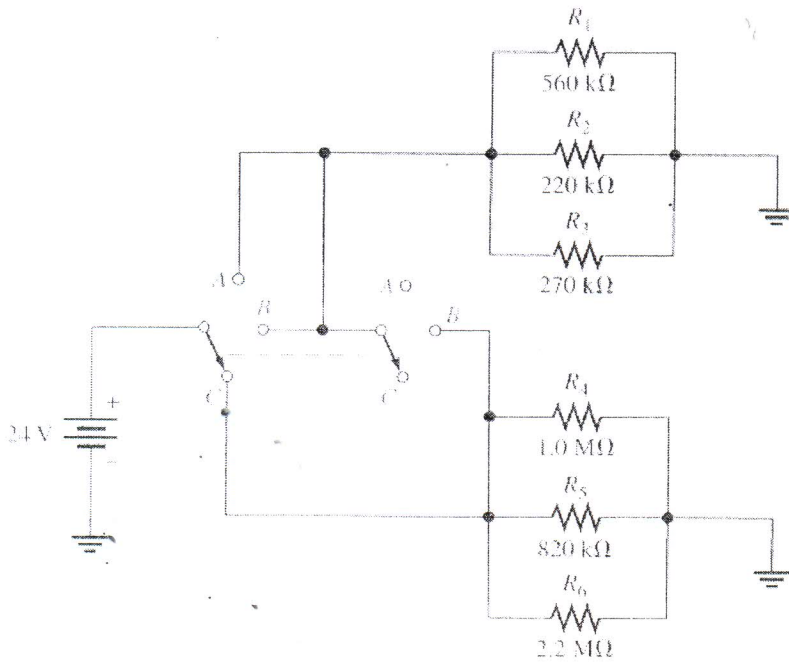
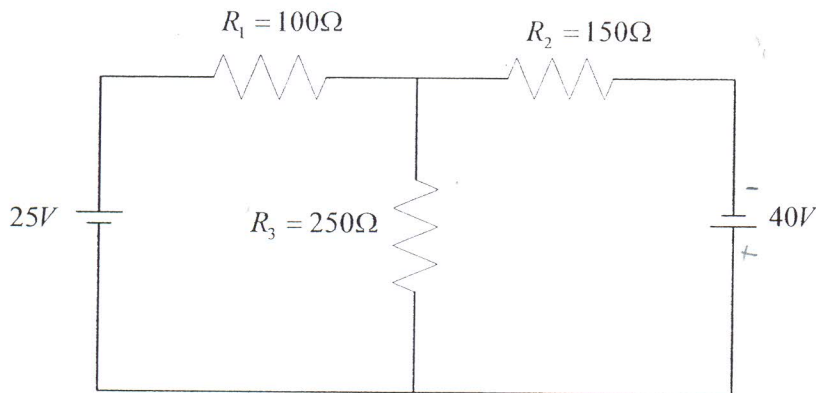


Figure 2

**Question 3**

Use mesh analysis to find the current in each resistor of the circuit shown in **Figure 3**. After finding the current, find the power dissipated at resistor  $250 \Omega$

(20 marks)



**Figure 3**

SECTION B (Total :40 marks)

INSTRUCTION: Answer only TWO (2) questions.

Question 4

a) In a series-parallel circuit as shown in **Figure 4**, the two parallel branches B and C are in series with A. Calculate :-

- i. The total resistance,  $R_T$
- ii. The currents  $I_A$ ,  $I_B$  and  $I_C$ .
- iii. The voltage drop across each resistor ( $V_A$ ,  $V_B$ ,  $V_C$  and  $V_D$ )

(12 marks)

- b) i. Briefly explain the Kirchhoff's Voltage Law and Kirchhoff's Current Law.
- ii. From **Figure 4**, verify that  $V_S = V_A + V_B + V_D$  and  $I_A = I_B + I_C$

(8 marks)

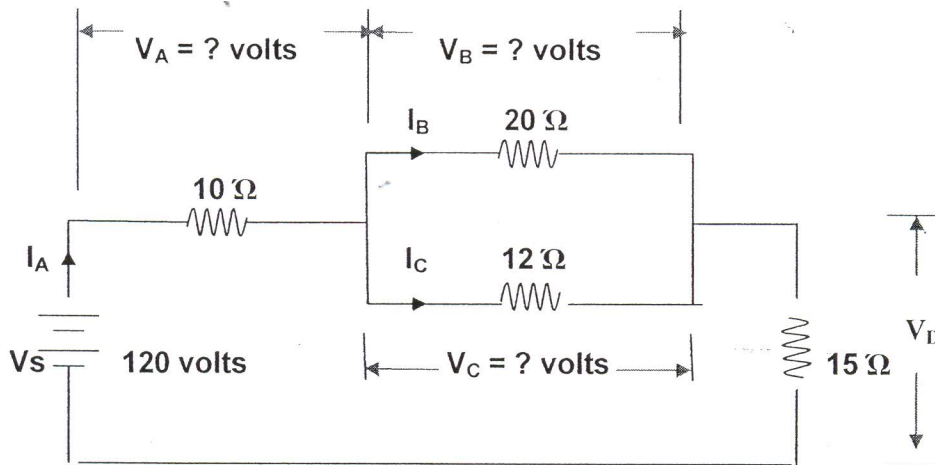


Figure 4

## Question 5

- a) What are the 5 steps for applying Thevenin's Theorem? (5 marks)
- b) Determine the voltage and current for the load resistor in the bridge circuit of **Figure 5**. (15 marks)

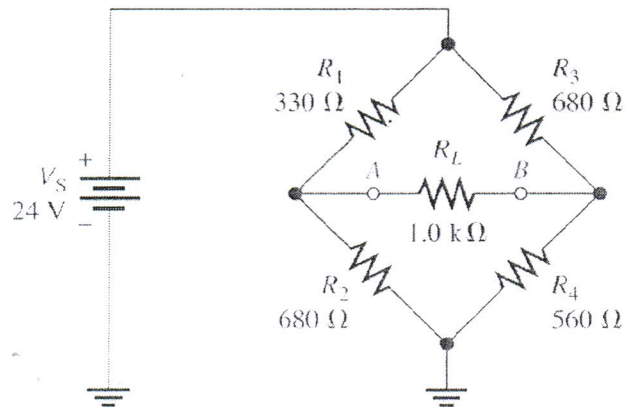


Figure 5

## Question 6

- a) What are the 4 steps for applying Superposition Theorem? (8 marks)
- b) Determine the current through  $R_3$  by using Superposition theorem (12 marks)

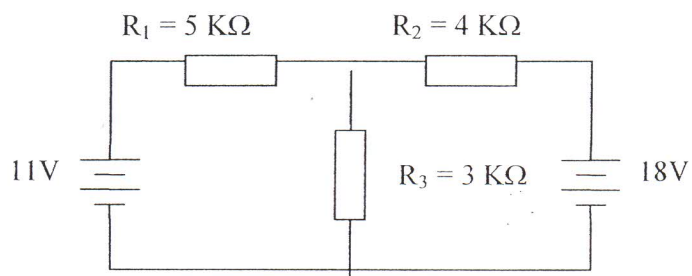


Figure 6

END OF QUESTION PAPER