SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION

JANUARY 2011 SESSION

SUBJECT CODE	:	FEB16103
SUBJECT TITLE	:	ELECTRICAL AND ELECTRONICS FUNDAMENTALS
LEVEL	:	BACHELOR
DURATION	:	9.00am – 11.00am (2.0 HOURS)
DATE / TIME	:	10 May 2011

INSTRUCTIONS TO CANDIDATES

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. Answer all questions.

6. Answer all questions inEnglish.

THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

a) In the circuit shown in figure 1.0, determine

    i.   The total resistances for the circuit

(5 marks)

    ii.   The total current flow in the circuit

(5 marks)
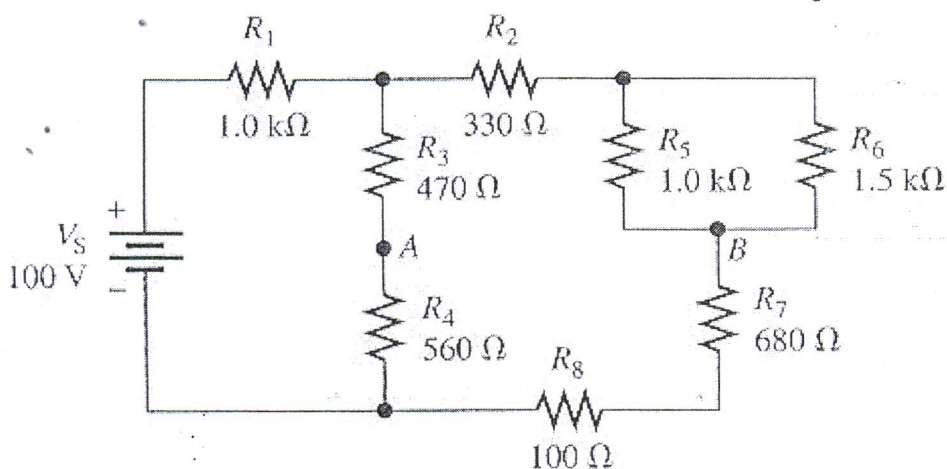
    iii.   Voltage drop at point A and B

(5 marks)

Figure 1.0

Question 2

a) From the Figure 2.0, determine the thevenin equivalent circuit as seen by R_L.

    i.   The Thevenin equivalent resistances, R_{TH}

(5 marks)

    ii.   The Thevenin voltage, V_{TH}

(5 marks)

    iii.   The current flowing inside the circuit, I_{TH}

(5 marks)
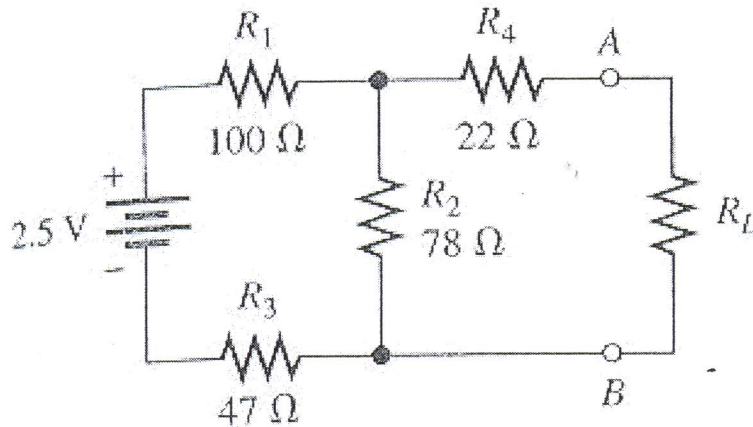
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Figure 2.0

Question 3

1) Draw the circuit diagram of a full wave bridge rectifier network supplying a resistive load. Clearly stated the voltage and current waveform for the input and output.

(5 marks)

2) Prove that for a full wave rectifier that the mean value for voltage is $V_{DC} = \dfrac{2V_M}{\pi}$

(5 marks)

3) Prove that for a full wave rectifier that the rms value for voltage is $V_{rms} = \dfrac{V_M}{\sqrt{2}}$

(5 marks)

4) Finally prove that for a full wave rectifier that the efficiency is 81%.

(5 marks)

5) Describe with the aid of suitable diagram, the half wave bridge rectifier action of a semiconductor diode.

(5 marks)

QUESTIONS 4

a) In Figure 3.0, use Thevenin's theorem at resistor R_4 for the value of 10 kΩ to determine;

  i.   The Thevenin voltage, V_{TH}

(5 marks)

2

ii.   The Thevenin Resistance, R_{TH}

(5 marks)

iii.   The current, I_L

(5 marks)

iv.   The Voltage, V_L

(5 marks)
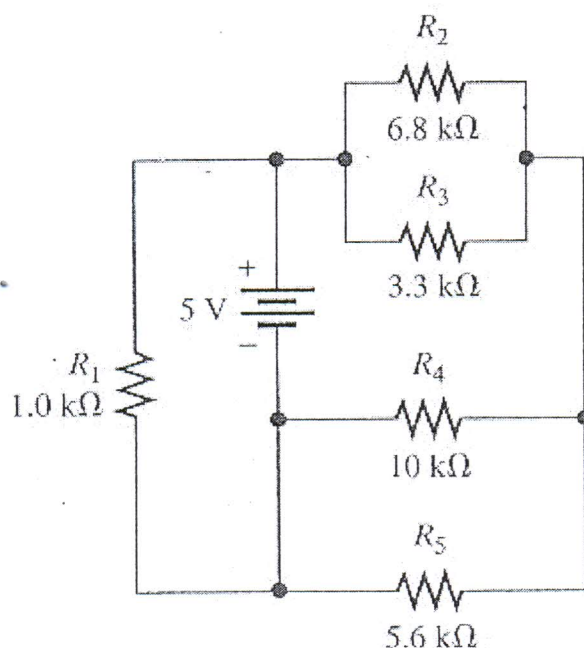

Figure 3.0

b) The rectifier at figure 4.0 is assuming to be ideal. Calculate the peak current in each of the resistor given that the supplied voltage is sinusoidal.
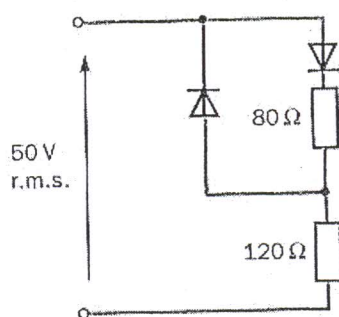
(5 marks)

Figure 4.0

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QUESTIONS 5

a) Simplify the following expression

   i. $F = (A + B).(A + B)$

(5 marks)

   ii. $F = (A + B.\bar{C}).(A + B.\bar{C})$

(5 marks)

   iii. $F = (A + B).(\overline{A + B})$

(5 marks)

b) Draw the network to generate the function

   i. $F = \overline{A.B + C}$

(5 marks)

END OF QUESTION