



# COLLEGE OF ENGINEERING & TECHNOLOGY

Department : Electrical & Control Engineering

Lecturer : Department Staff

Course : Electrical Engineering Fundamentals Marks: 40

Course Code: EE 238

Time: 2 hours

Date : 18 / 1 / 2016

Starting time: 11:30

## Final Exam Paper

Answer the following questions:

1) Find the voltage  $v_o$  in the circuit shown in figure (1) using node voltage method OR mesh current method.

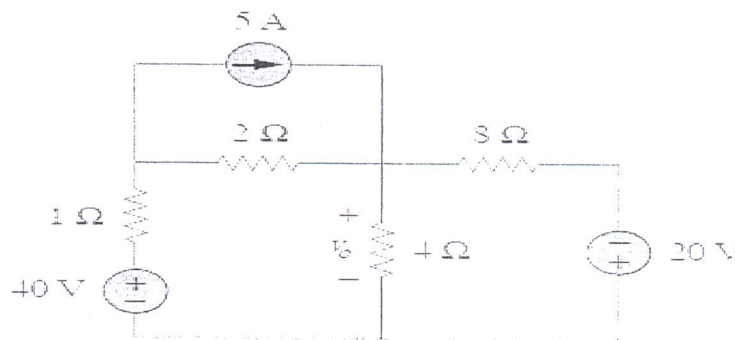


Figure (1)

(8 Marks)

2) Using source transformation method, determine the power dissipated in the  $10\ \Omega$  resistor in the circuit shown in figure (2).

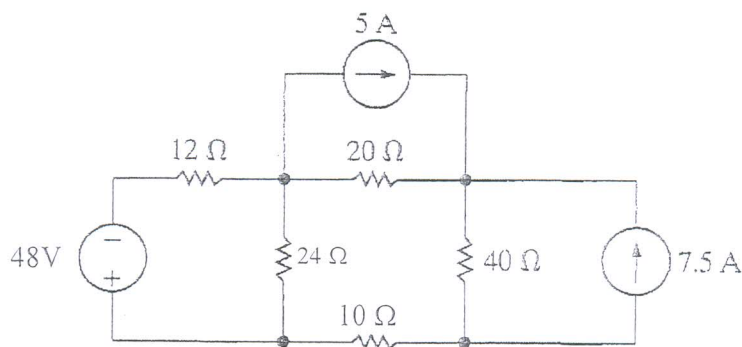


Figure (2)

(10 Marks)

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3) In the magnetic circuit shown in figure (3), calculate the Ampere-turn required to produce a flux of  $1\text{mWb}$  in any of the side limbs. The length of each of the air gaps is  $1\text{ mm}$ , while

$$L_{af} = L_{be} = L_{cd} = 12\text{ cm}$$

$$L_{ab} = L_{bc} = L_{de} = L_{ef} = 10\text{ cm}$$

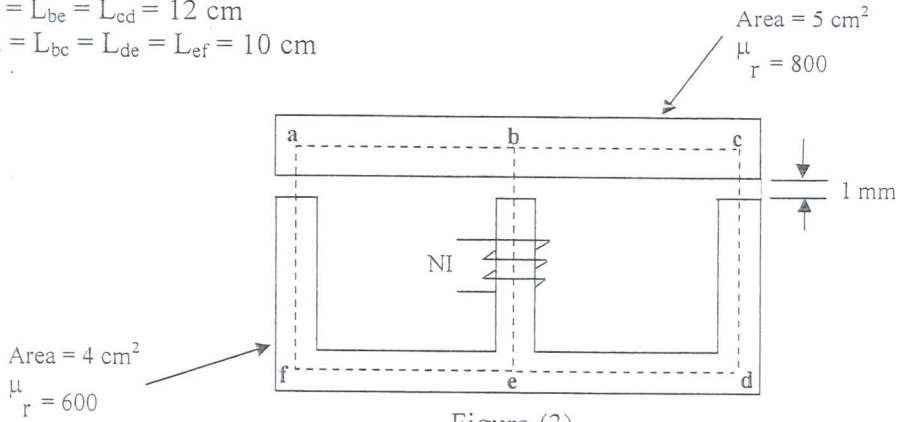


Figure (3)

(8 Marks)

4-a) Find the average value and the effective (RMS) value for the waveform shown in figure (4).

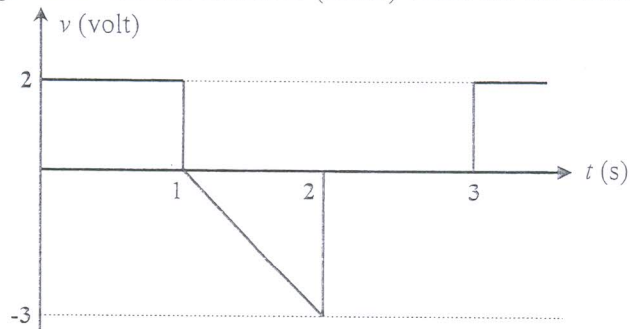


Figure (4)

(6 Marks)

4-b)

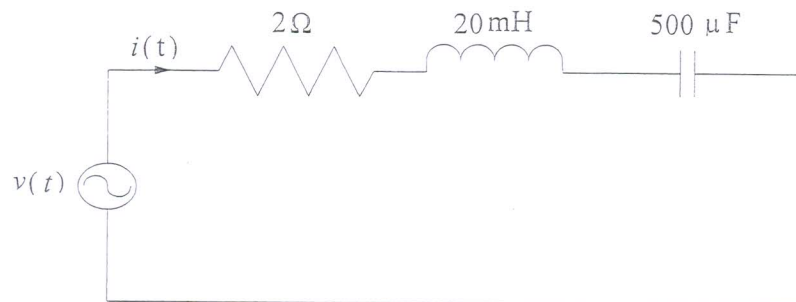


Figure (5)

For the circuit shown in figure (5), given  $v(t) = 311.13 \sin(314t + 30^\circ)$  Volt, find:-

- The total circuit impedance.
- The instantaneous expression of the current  $i(t)$ .
- The voltage across each element ( $V_R$ ,  $V_L$ , and  $V_C$ ) in phasor form.
- The active or average power.

(8 Marks)

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Head of Department: Prof. Hamdy Ashour	<i>Hamdy</i>	3/1/2016