KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

Department of Electrical Engineering

EE 204 (062)

Final Exam
Monday June 11, 2007
7:00-9:30 pm
Location OAB

Student Name :

Student ID# :

Instructor's Name:

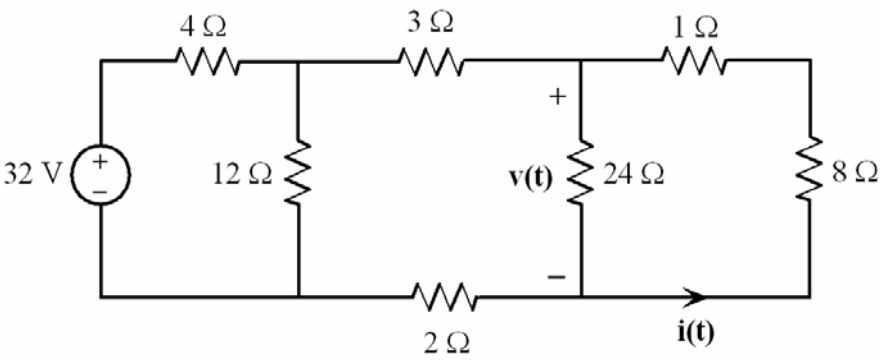
Select your instructor's name from the following:

- ☐ Mr. Tasadduq (sections 1 & 2)
- ☐ Dr. Bakhashwain (section 3)
- ☐ Mr. Johar (section 4)
- ☐ Dr. Al-Ahmari (section 5)
- ☐ Dr. Alakhdhar (section 6)

	Maximum score	**Score**
Problem 1	20%	
Problem 2	20%	
Problem 3	20%	
Problem 4	20%	
Problem 5	20%	
Total	100%	

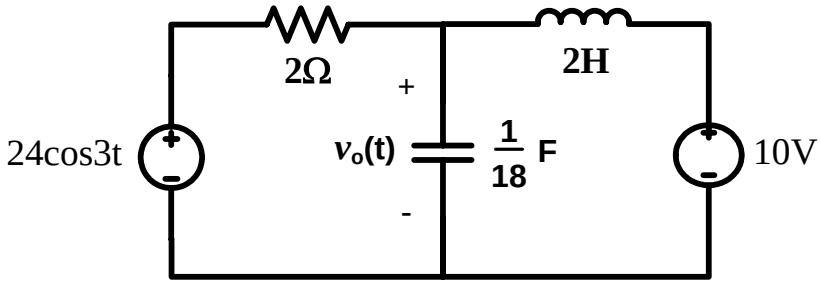
Problem 1:

For the circuit shown, determine the current **i(t)** and the voltage **v(t)**.



Problem 2:

Determine the voltage $v_o(t)$ in the circuit shown.

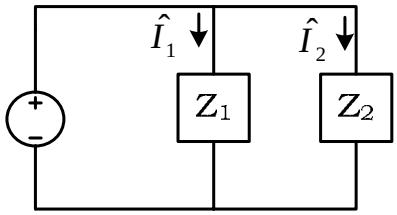


Problem 3:

The two loads **Z_1** & **Z_2** in the circuit shown are **described** by:

Z_1 absorbs **12 kW** at **0.9 lagging** pf**.**

Z_2 = 4 + j 4 Ω.



$\hat{V} = 240\sqrt{2}\angle 0^\circ$ V

$\omega = 10^3$ rad/s

a) Determine the current $\hat{I}_1$

b) Determine the current $\hat{I}_2$

c) Determine the ***complex power*** $\hat{P}$ delivered by the source.

d) Determine the ***real power*** P_{AV} delivered by the source.

e) Determine the ***reactive power*** Q delivered by the source.

Problem 4:

A balanced **Y – Δ** connected three phase system as shown, has **V_{ab} = 208 ∠45⁰ (rms)**.

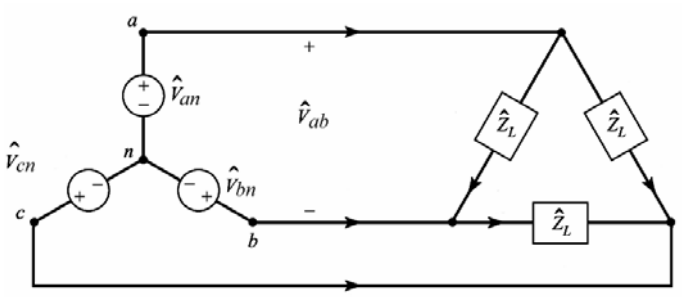
The per phase impedance of the load is $\hat{Z}_L = 6\sqrt{2}\angle 45^\circ\,\Omega$ **.** Find the following:

a) The **phase voltages** of the source.

b) The **phase voltages** of the load.

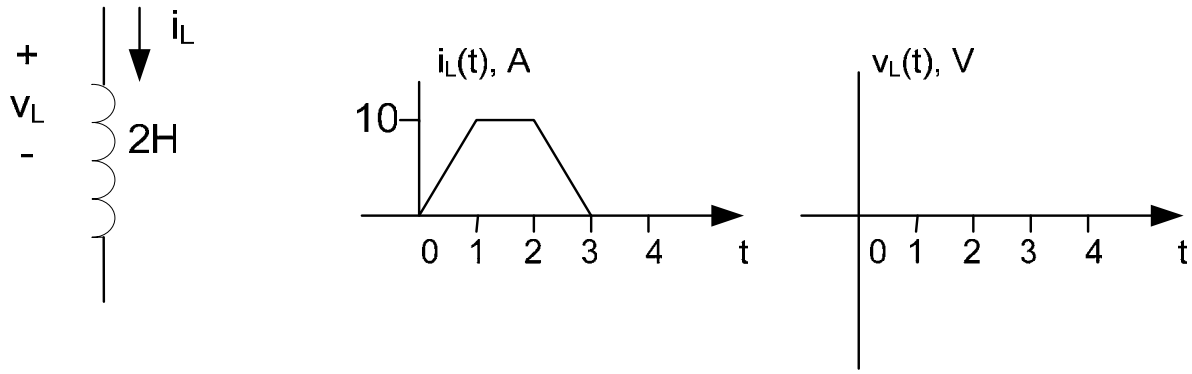
c) The **line currents**.

d) The **total power** absorbed by the load.

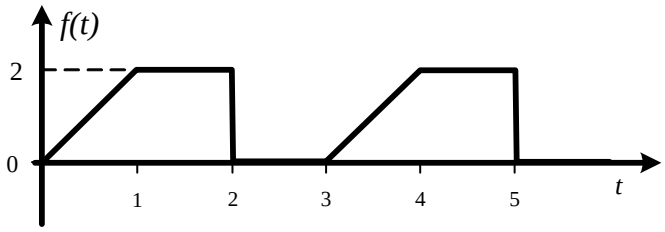


Problem 5 (a,b,c and d):

a) The current $\mathbf{i_L(t)}$ through the 2H inductor is shown. Sketch the voltage $\mathbf{v_L(t)}$ for $0 \le t \le 4s$

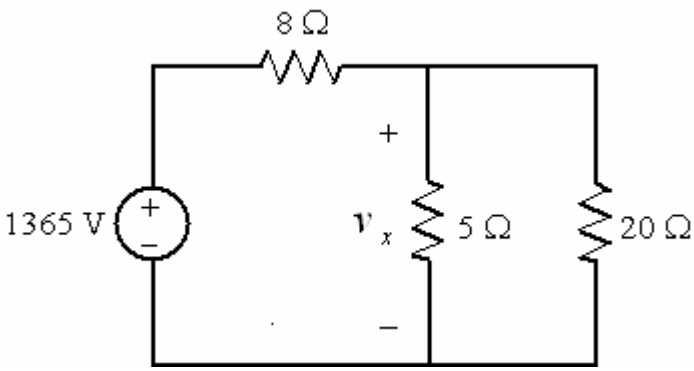


b) **Calculate the RMS (effective) value** of the periodic function $f\ (t)$ shown in the figure below.



c) For the following circuit, the voltage v_x is:
(circle only the currect answer)

1) 1092 V
2) 975 V
3) 525 V
4) 455 V
5) 273 V



d) The load in the circuit shown has a current $\boldsymbol{I_L}$**=200 A** at **pf=0.8** lagging, and a frequency **60Hz**. Calculate the value of the capacitor ***C*** to correct the power factor of the parallel combination of the capacitor and the load to unity (**pf=1**).