## **King Fahd University of Petroleum and Minerals**

## Electrical Engineering Department

EE 208: Electrical Systems

Department EE *Instructor: Elmar III. Johar* 

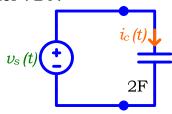
## Home Work #4

1. The current across a 0.5H inductor is given by:

$$i_s = \begin{cases} 0 & t < -1 & \& t \ge 1 \\ 1 - t^2 & -1 \le t < 1 \end{cases}$$

Find:  $i_L(t)$ , p(t),  $w_L(t)$  and plot them.

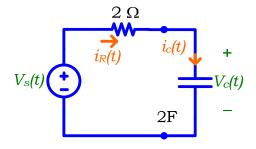
- **2.** For the circuit shown, if the voltage  $v_s(t) = 3e^{-5t}[V]$  for  $t \ge 0$ ,
  - a. find  $i_c(t)$  for  $t \ge 0$ .
  - b. find the energy stored in the capacitor for  $t \ge 0$ .



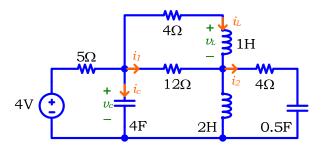
**3.** The voltage across the capacitor in the circuit below is given by:

$$v_{c}(t) = \begin{cases} 0, & t \le 0 \\ 3t, & 5 \ge t > 0 \\ -3t + 30, & 5 \le t > 10 \\ 0, & t > 10 \end{cases}$$

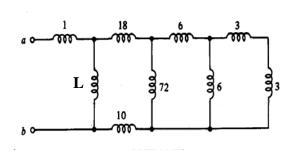
Find:  $i_c(t)$ ,  $v_s(t)$  and  $w_c(t)$ 



**4.** For the circuit shown, calculate the unknown quantities.



**5.** If the **value of L** is equal to the equivalent inductance at terminals a & b, **find the equivalent inductance**.



**6.** In the circuit shown below, what <u>value of R</u> will make the **energy** stored in the **inductor** and the **capacitor** equal?

