

Sirindhorn International Institute of Technology

Thammasat University at Rangsit

School of Information, Computer and Communication Technology

## ECS 203: Problem Set 9

**Semester/Year:** 2/2015

**Course Title:** Basic Electrical Engineering

**Instructor:** Asst. Prof. Dr. Prapun Suksompong ([prapun@siit.tu.ac.th](mailto:prapun@siit.tu.ac.th))

**Course Web Site:** <http://www2.siiit.tu.ac.th/prapun/ecs203/>

**Due date: April 4, 5 PM**

### Instructions

1. Solve all problems. (5 pt)
  - a. Write your name and ID on the top of **every** submitted page.
  - b. For each part, write your explanation/derivation and answer in the space provided.
2. ONE sub-question will be graded (5 pt). Of course, you do not know which part will be selected; so you should work carefully on all of them.
3. There is no need to submit (or even print out) page 1 (this cover sheet).
4. Late submission will be rejected.
5. **Write down all the steps** that you have done to obtain your answers. You may not get full credit even when your answer is correct without showing how you get your answer.

## Questions

- 1) [Irwin and Nelms, 2015, Ex. 6.2]  
The voltage across a  $5\text{-}\mu\text{F}$  capacitor has the waveform shown in Figure 1.

- a) Determine the current waveform.

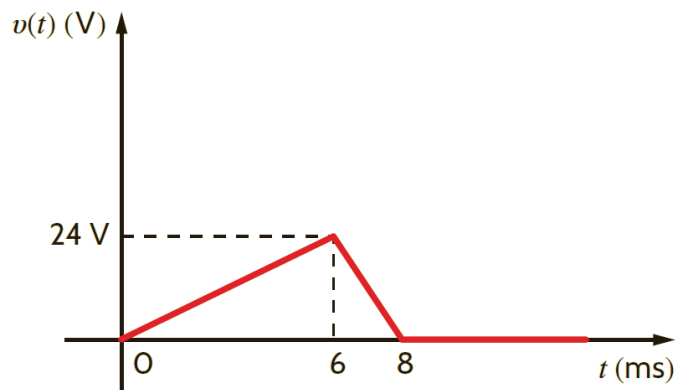


Figure 1

- b) Determine the energy stored in the electric field of the capacitor at  $t = 6$  ms.

- 2) [Alexander and Sadiku, 2009, Q6.13] Find the voltage across the capacitors in the circuit of Figure 2 under dc conditions.

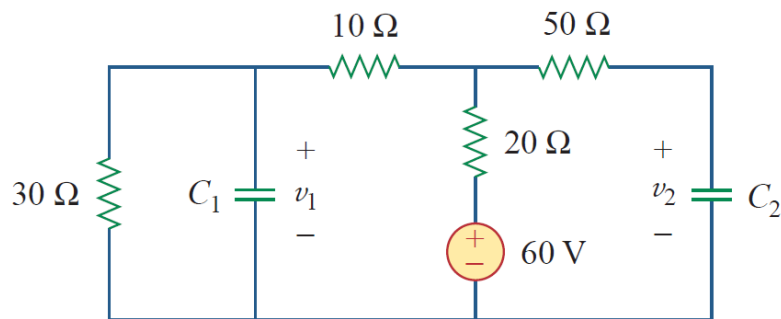


Figure 2

- 3) [Alexander and Sadiku, 2009, Q6.19] Find the equivalent capacitance between terminals *a* and *b* in the circuit of Figure 3. All capacitances are in  $\mu\text{F}$ .

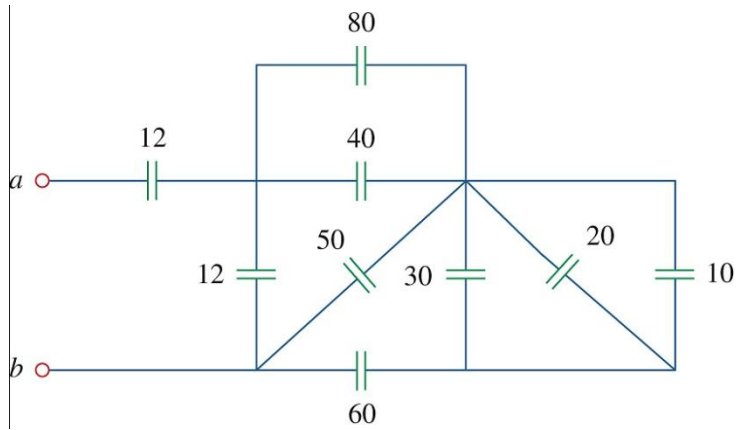


Figure 3

- 4) [Alexander and Sadiku, 2009, Q6.20] Find the equivalent capacitance at terminals a-b of the circuit in Figure 4.

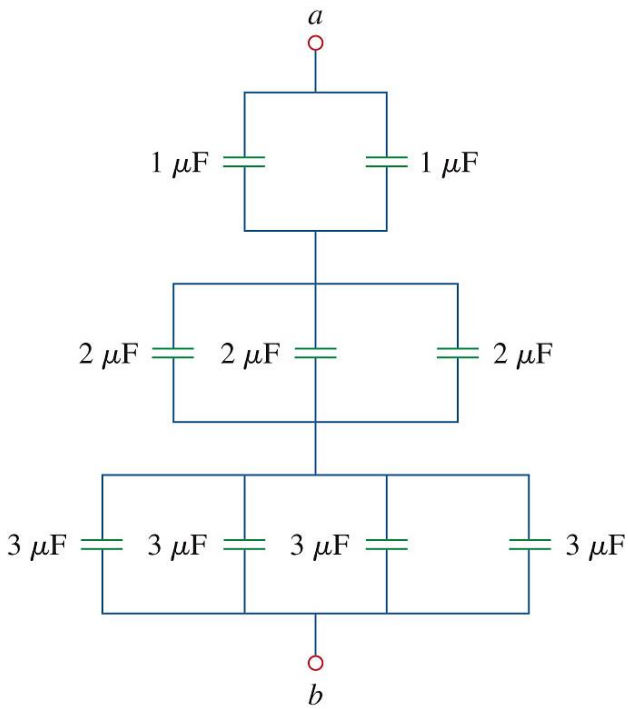


Figure 4