

HOMework SET 4

DUE DATE: 2/16/16

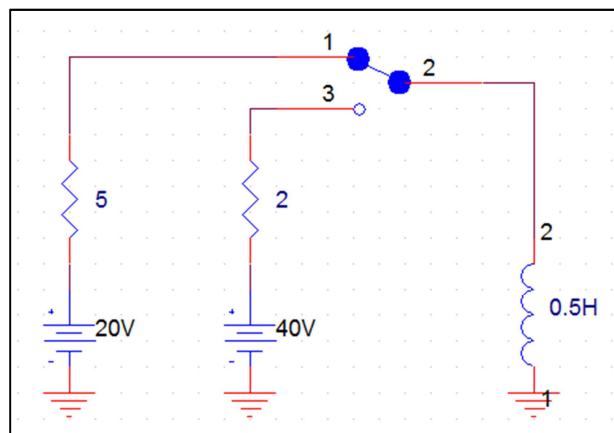
TEXTBOOK PROBLEMS:

5.14, 5.19, 5.24, 5.31, 5.44, 5.65, 5.73, 5.89

6.13, 6.21, 6.25, 6.40, 6.53, 6.65

SUPPLEMENTAL QUESTION:

1. In the circuit shown below, the switch bridges terminals 1 and 2 for a long time. At $t = 0$, the switch is instantaneously reconfigured so that it bridges terminals 2 and 3. Solve for the inductor current $i(t)$ for $t > 0$.



2. Simulate the circuit shown above using LTSPICE. Plot the current through the inductor between $T = [0, 5\tau]$ seconds

FINAL PROJECT SELECTION

Pick a research topic that involves an electronic and/or electro-mechanical system. The research topic should be in-line with something you are personally interested in understanding more about or physically demonstrating.

Once you have selected a topic, you will need to write a proposal about the research topic. The proposal outline should include the following:

1. Introduction of the project (What is it)
2. Description of the project scope (Project intended purpose)
3. Description of the intended goals and outcomes of the project (Project expectations)

4. Description of the deliverables from the project (ie: Simulation, physical prototype, etc.)

Note that the proposal should not exceed 1-page in length, with 1.5-space separation between lines and a font size of 11 (Times New Roman).

You can select up to three other class members to work with on the project. However, the amount of work should be proportional to the members in the group. To accomplish this, each group member should pick a part of the larger system to research. When submitting the proposal, include the names of each member and a description of their part of the project. Only one group member need submit a proposal.

Examples of some possible research topics are:

1. Differential equation solver
2. Audio speaker amplifier with band-selectable frequency filtering
3. Motor controller (AC and DC)
4. DC to AC power inverter
5. AC to DC power converter
6. Power management systems (LDO, Buck, Boost, Semic) (sic)
7. Garbage can opener
8. Proximity detector