King Mongkut's University of Technology Thonburi
Midterm Exam of First Semester, Academic Year 2015

CPE 221 Circuits and Electronics for Computer Engineers   **CPE(Inter.) Students**

Thursday 24 September 2015   **13.00-16.00**

Instructions
1. This examination contains 7 problems, 6 pages (including this cover page), The total score is 30 points.
2. The answers must be written in the space provided.
3. Students are allowed to use **calculator.**
4. **Books, notes,** and **dictionary** are **NOT** allowed.

Students must raise their hand to inform to the proctor upon their completion of the examination, to ask for permission to leave the examination room.
Students must not take the examination and the answers out of the examination room.

Students will be punished if they violate any examination rules. The highest punishment is dismissal.

This examination is prepared by
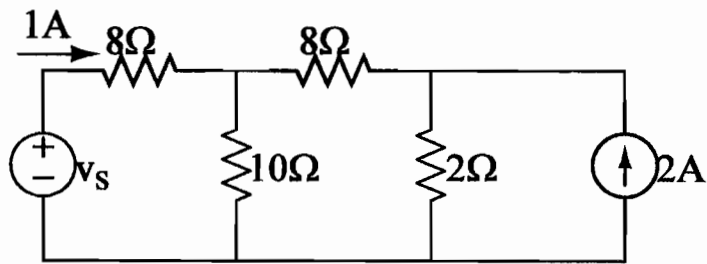
Asst. Prof. Sanan Srakaew

Tel. 0-2470-9083

This examination paper is approved by Computer Engineering Department.

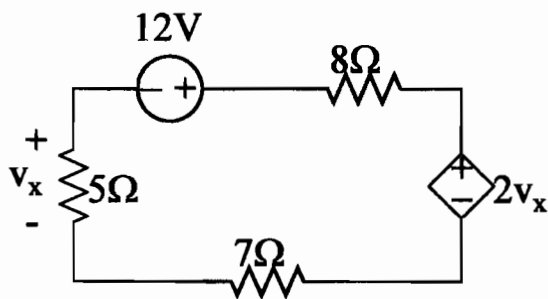| Problems	1	2	3	4	5	6	7
Points	4	3	3	6	4	6	4
Points earned							

Student Name: _____   I.D.: _____

1. Determine the power supplied by the voltage source.   (4 points)
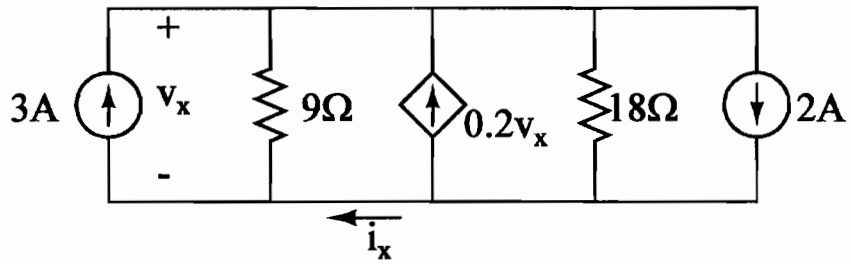

2. Use mesh analysis to determine the mesh current and power supplied by the dependent voltage source.   (3 points)
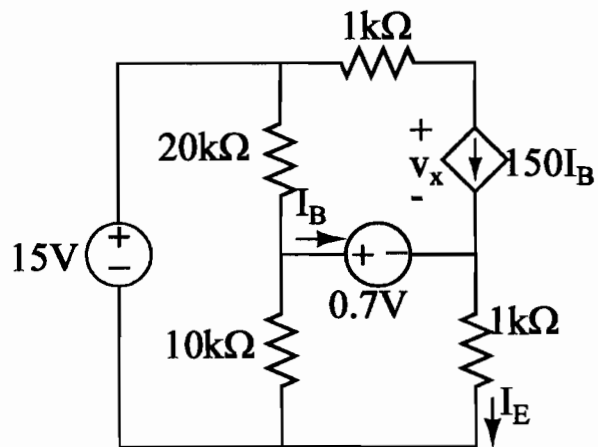
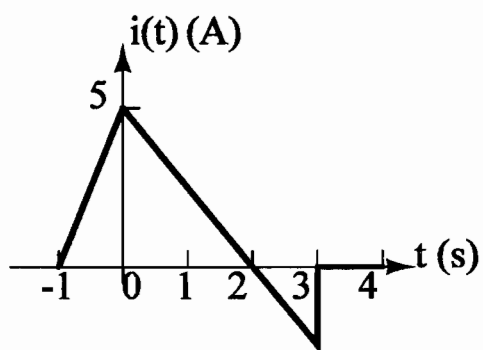3. Use nodal analysis to determine v_x, i_x, and the power on the 2-A source. (3 points)

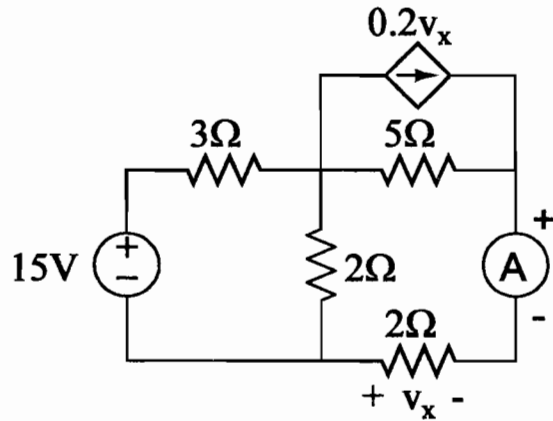4. Determine the current I_E and the voltage v_x. (6 points)

5. The current flowing through a point in a device is shown below. Calculate the charge through the point at (a) t = 0 s; (b) t = 2 s; (c) t = 3 s; (d) t = 4 s. (e) Sketch q(t).   (4 points)
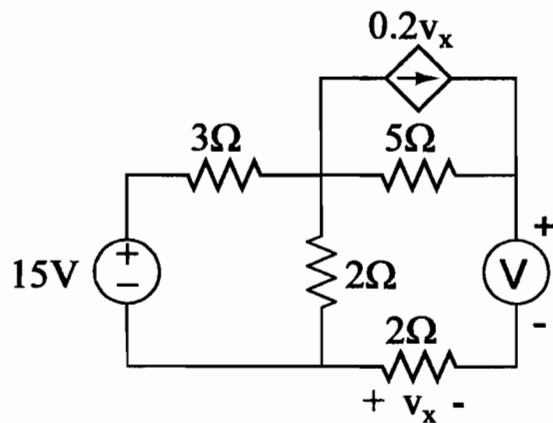
6. What is the ammeter reading(short-circuit current)? (3 points)
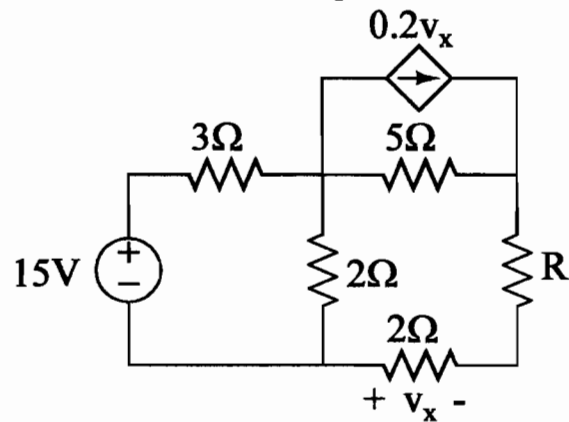
$0.2v_x$

3Ω   5Ω

15V

2Ω   A   +

2Ω   -

+ v_x -

What is the voltmeter reading(open-circuit voltage)? (2 points)

$0.2v_x$

3Ω   5Ω

15V

2Ω   V   +

2Ω   -

+ v_x -

Determine the maximum power delivered to the variable resistor R. (1 point)

$0.2v_x$

3Ω   5Ω

15V

2Ω   R

2Ω

+ v_x -

7. Find the load voltage V_L and output current I_o in the circuit. (4 points)