



Seat No. : _____

King Mongkut's University of Technology Thonburi
Midterm Exam of Second Semester, Academic Year 2010

CPE 223 Circuits and Electronics for Computer Engineers

CPE(Inter.) Students

Thursday 23 December 2010

13.00-16.00 h.

Instructions

1. This examination contains 10 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** and **protractor**.
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

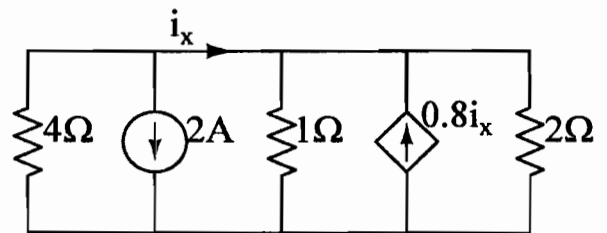
Tel. 0-2470-9254

This examination paper is approved by Computer Engineering Department.

Student Name: _____ I.D.: _____

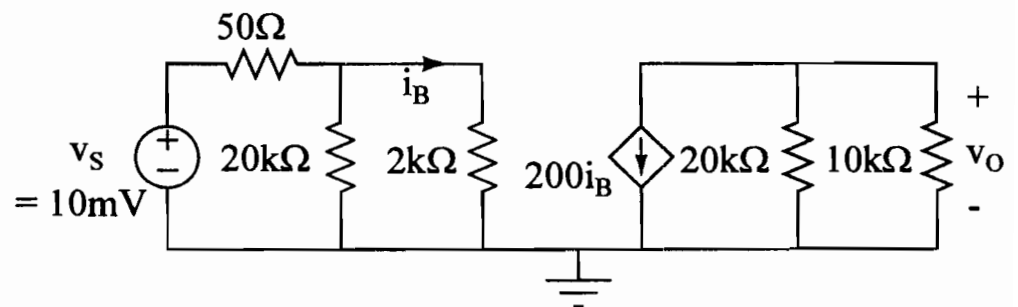
1. From the Figure below, find the current i_x .

(2 points)

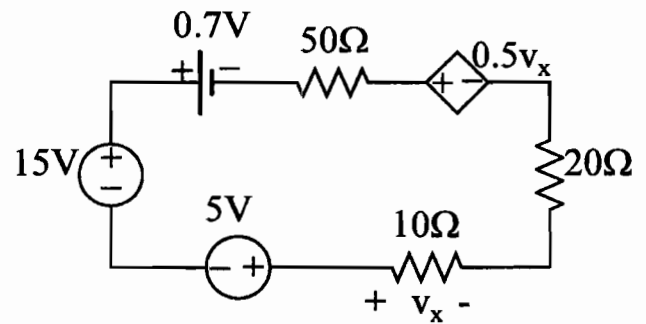


2. Apply KCL to the circuit below and then find the output voltage v_o .

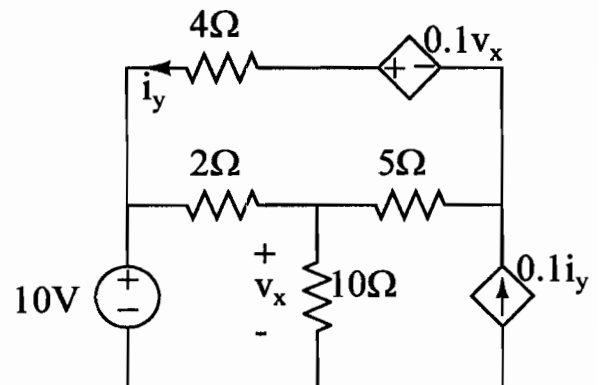
(3 points)



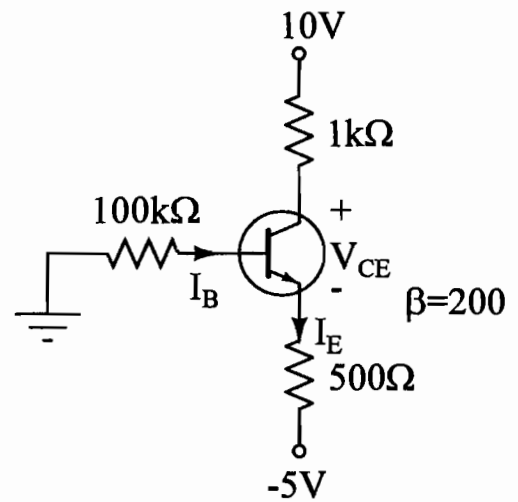
3. From the Figure below, find the power on the dependent voltage source. Is it a power generation or dissipation? (3 points)



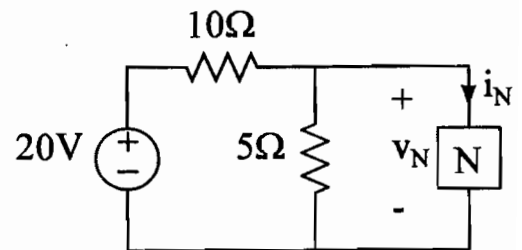
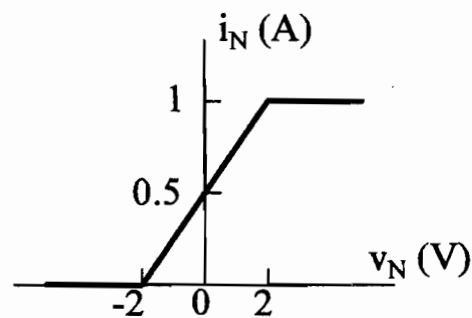
4. Apply KVL to the circuit below and then find v_x and i_y . (4 points)



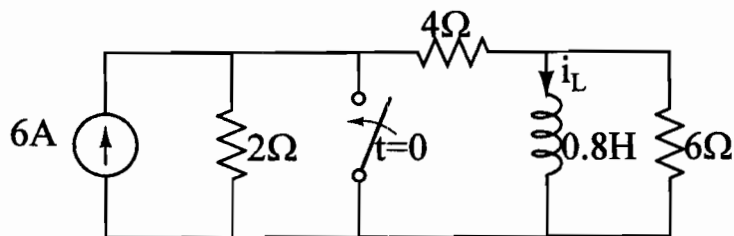
5. Given the transistor circuit below, find I_B , I_E , and V_{CE} . Also, determine whether the transistor is in active state or not. Why or why not? Given $V_{BE} = 0.7$ V. (3 points)



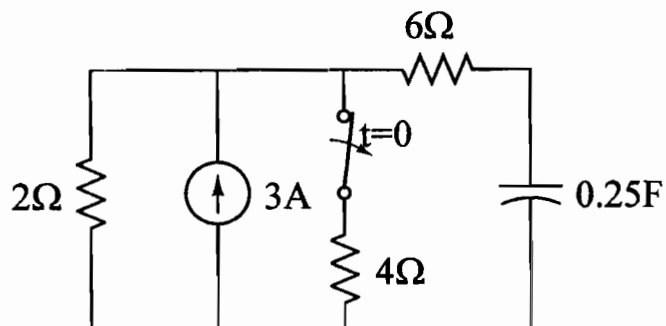
6. Given the characteristic curve of the non-linear device N and the circuit below. Find i_N and v_N . (3 points)



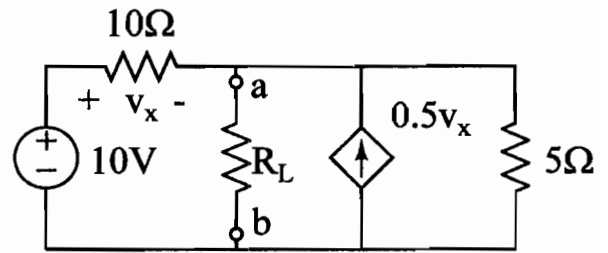
7. From the circuit below, the switch has been opened for a long time. At time $t = 0$, the switch is thrown. Find (a) $i_L(0^-)$; (b) $i_L(0^+)$; (c) $i_L(t)$; (d) Sketch $i_L(t)$, for $-1 < t < 1$. (3 points)



8. From the circuit below, the switch has been closed for a long time. At time $t = 0$, the switch is thrown. Find (a) $v_C(0^-)$; (b) $v_C(0^+)$; (c) $v_C(t)$. (d) Sketch $v_C(t)$, for $-5 < t < 5$. (3 points)



9. Find the value of the resistor connected between points **a** and **b** so that the power dissipation on the resistor is maximum. Also, find that power. (3 points)



10. Determine and draw the phasors \tilde{V}_S , \tilde{V}_L , \tilde{V}_C , and \tilde{V}_R . (3 points)

