RULES:

- **Please try to work on your own. Discussion is permissible, but identical submissions are unacceptable! See "上海科技大学学生学术诚信规范与管理办法", http://sist.shanghaitech.edu.cn/cn/NewsDetail.asp?id=782**
- **Please show all intermediate steps: a correct solution without an explanation will get zero credit.**
- **Please submit on time. NO late submission will be accepted.**
- **Please prepare your submission in English only. No Chinese submission will be accepted.**

1. [10%] Find i_0 in the circuit of Fig 1 using superposition.

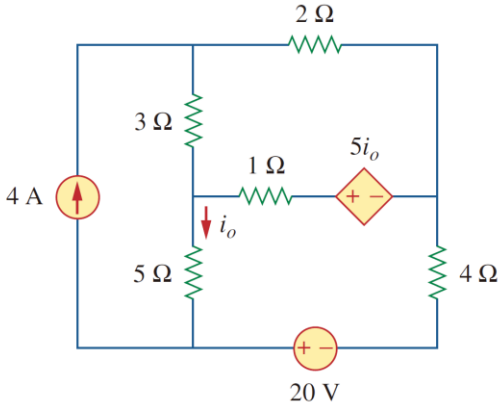

Fig 1

2. [10%] Find the Norton equivalent with respect to the terminals a,b for the circuit seen in Fig 2:

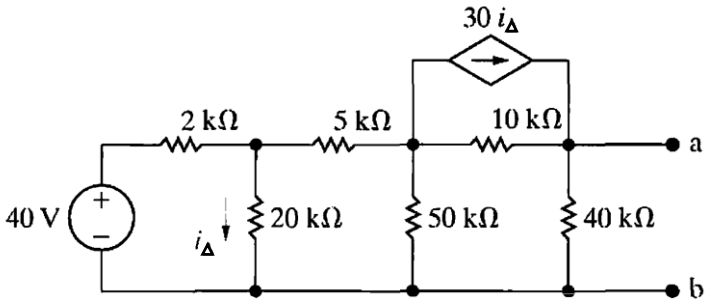

Fig 2

3. [10%] Determine the Thevenin equivalent with respect to the terminals a,b for the circuit shown in Fig 3:

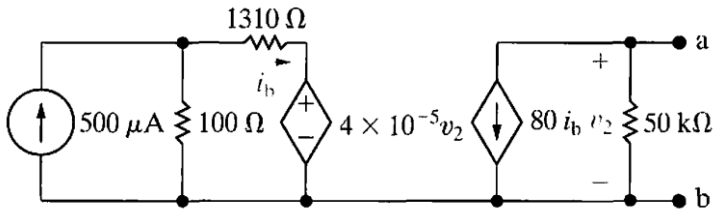

Fig 3

4. [10%]

a) Find the current in the 10kΩ resistor in the circuit in the figure below by making a succession of appropriate source transformations.

b) Using the result obtained in (a), work back through the circuit to find the power developed by the 100V source.

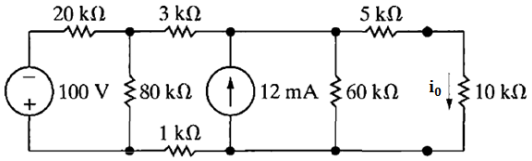

Fig 4

5. [10%] The variable resistor in the circuit in the figure below is adjusted for maximum power transfer to R_0.
   a) Find the numerical value of R_0.
   b) Find the maximum power delivered to R_0.
   c) How much power does the 280 V source deliver to the circuit when R_0 is adjusted to the value found in (a)?

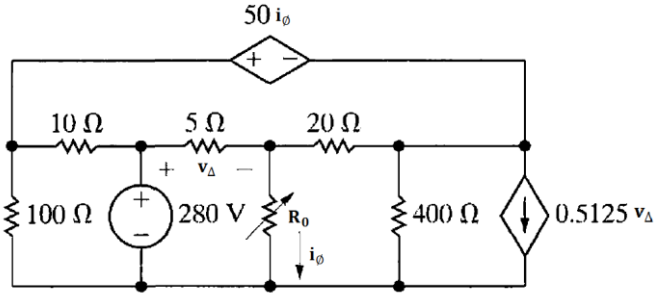

Fig 5

6. [15%] Compute the value of R that results maximum power transfer to the 10-resistor in Fig 6:

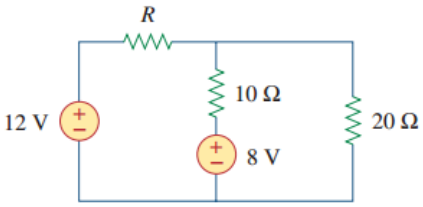

Fig 6

7. [10%] Find v_0 and i_0 in the circuit of Fig 7.

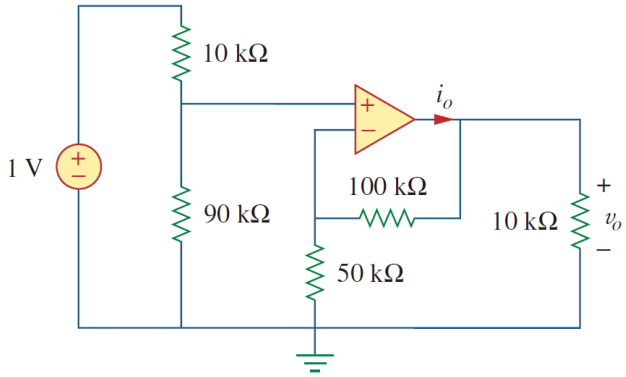

Fig 7

8. [10%] In the circuit shown in Fig 8, find k in the voltage transfer function $v_0 = kv_s$.

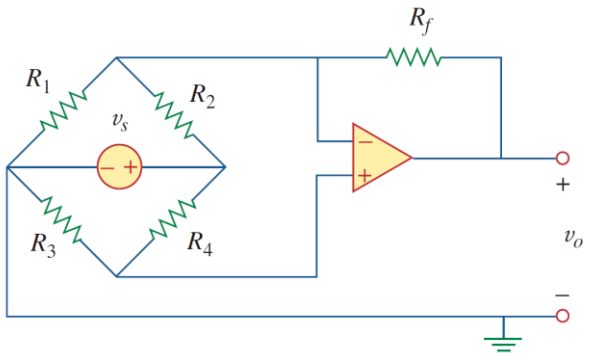

Fig 8

9. [15%] Determine v_0 in the op amp circuit of Fig 9.

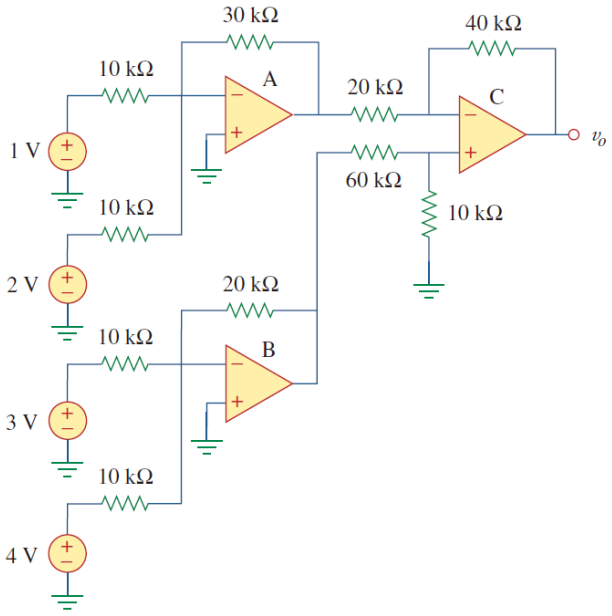

Fig 9