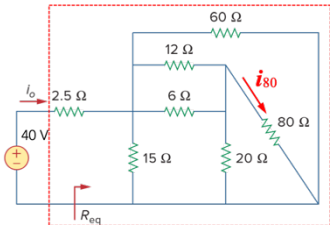
112-1 Electrical Engineering Fundamentals I Midterm Examination

Name: _____ No: _____ Instructor: Shyan-Lung Lin, Prof. FCU ISTM -PU 2+2 Program 13:10~15:00 pm, Nov. 9, 202

Note: Open text book. Please show organized math works, and make the calculation to its final form and with an accuracy of at least 4th digit behind decimal point.

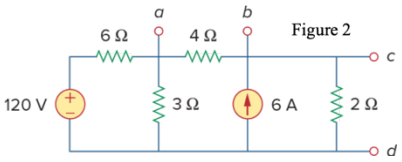
1. 15% Find R_{eq} (including 2.5Ω), i_O, and i_{80} in the circuit of Figure 1.



2. 30% Given the circuit in Figure 2,

(A) (15%) apply the **Thevenin** theorem to obtain the **Thevenin** equivalent V_{Th} and R_{Th}, and find the maximal power that can be transferred to the load as viewed from terminal ***a-b***;

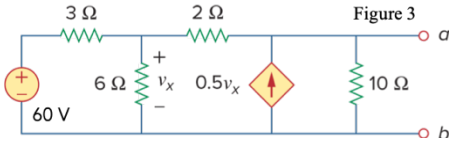
(B) (15%) apply the **Norton** theorem to obtain the **Norton** equivalent I_N and R_N, and find the maximal power that can be transferred to the load as viewed from terminal ***c-d***.



3. 30% For the circuit in Figure 3, at terminals ***a-b***,

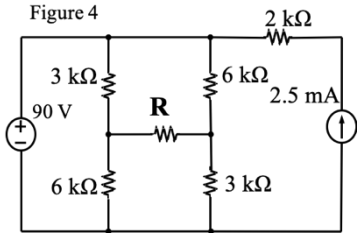
(A) (15%) use the **Thevenin** theorem to obtain the **Thevenin** equivalent

(B) (15%) use the **Norton** theorem to obtain the **Norton** equivalent



4. 20% For the circuit shown in Figure 4, if the current passing through the unknown resistor **R** is 0.5 mA, find the value of **R**.

Figure 4



5. 20% Use ***superposition*** to solve for v_x in the circuit of Figure 5.

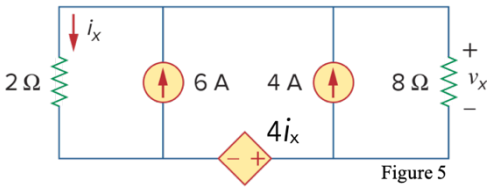


Figure 5

6. 20% Use ***mesh*** analysis and apply ***Cramer's*** rule to obtain i_o in the circuit of Figure 6.

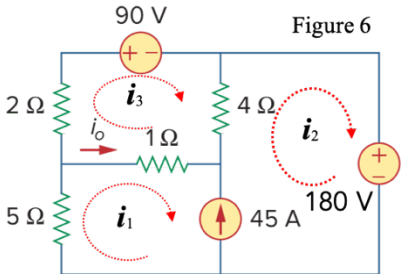


Figure 6