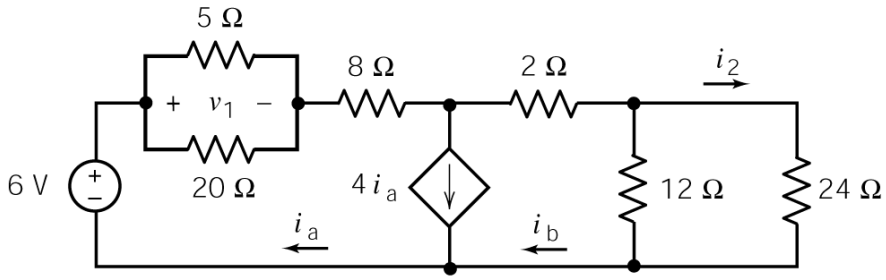
# ES 250 First Midterm Practice Exam 2

**1.**




$i_a$ = _−0.333__A, $i_b$ = ___1____A,

$i_2$ = __0.333__A,

and

$v_1$ = _−1.333__V

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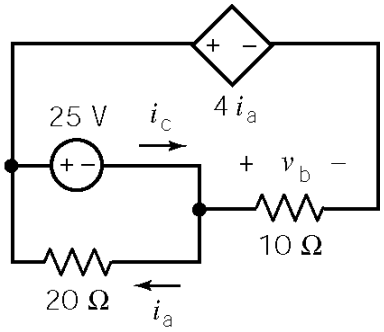
**2.**

The current in the 20-Ω resistor is $i_a$ = ____−1.25___A.

The voltage across the 10-Ω resistor is $v_b$ = ____−30_____V.

The (independent) voltage source current is $i_c$ = __−4.25____A.

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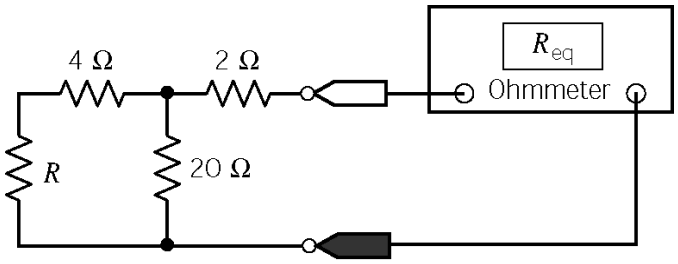
**3.**




The Ohmmeter measures equivalent resistance.

a. To cause $R_{eq}$ = 12 Ω, choose $R$ = ___16__Ω.

b. If $R$ = 14 Ω then $R_{eq}$ = ___11.5____Ω.

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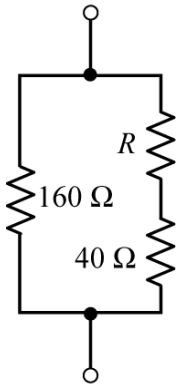
**4.**




Consider this combination of resistors. Let $R_p$ denote the equivalent resistance.

(a) Suppose 40 Ω ≤ $R$ ≤ 400 Ω. Determine the corresponding range of values of $R_p$:

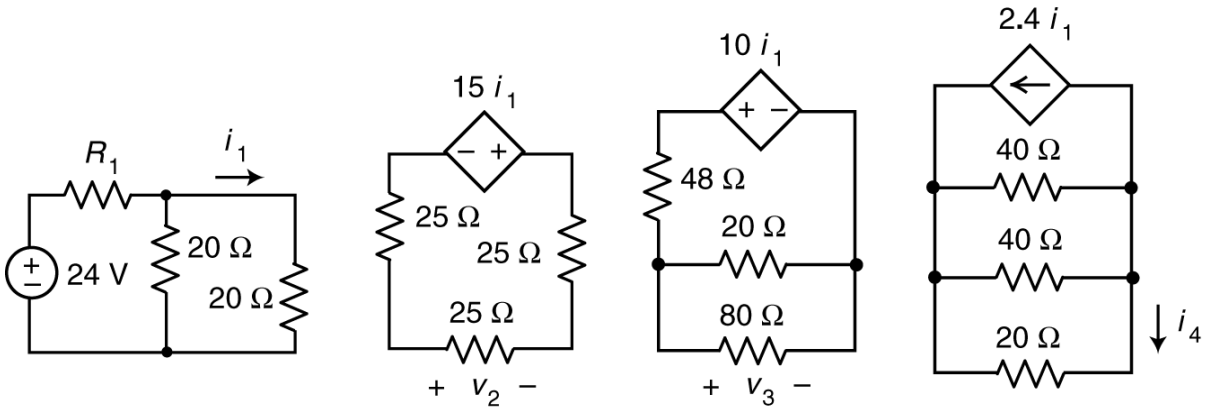
___53.33__ Ω ≤ $R_p$ ≤ __117.33___ Ω

(b) Suppose instead $R$ = 0 (a short circuit). Then $R_p$ = ___32____ Ω

(c) Suppose instead $R = \infty$ (an open circuit). Then $R_p$ = ___160___ Ω

(d) Suppose instead the equivalent resistance is $R_p$ = 80 Ω. Then $R$ = ___120___ Ω

**5.**




Here's a single circuit drawn in four parts for convenience. The four parts are connected by the dependent sources. Given that $i_1 = 0.8$ A, determine the values of $R_1$, $v_2$, $v_3$, and $i_4$.

$R_1$ = ____5____ Ω, $v_2$ = ____–4____ V, $v_3$ = ___2___ V and $i_4$ = __–0.96____ A.

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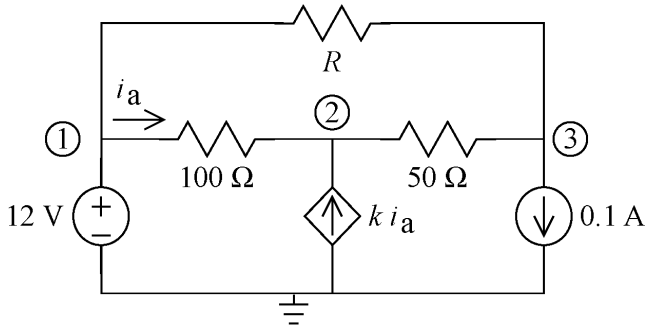
**6**.




Encircled numbers are node numbers. The corresponding node voltages are:

$v_1 = 12$ V, $v_2 = 10.5$ V and $v_3 = 6$ V

The value of the gain of the CCCS is $k$ = ____5.00_____ A/A.

The resistance of the resistor at the top of the circuit is $R$ = __600_____ Ω. (Round to an integer.)

The power supplied by the independent (0.1 A) current source is ____–0.6___ W.

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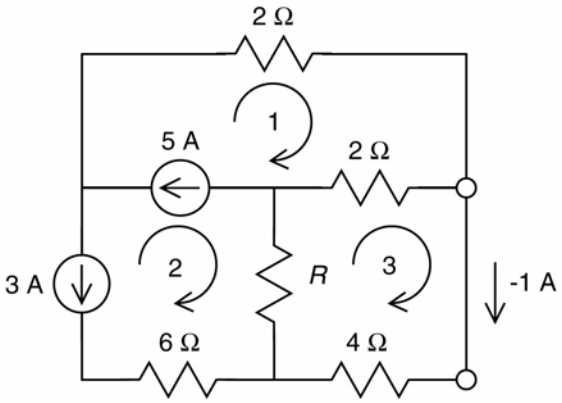
**7.**




Let $i_1$, $i_2$ and $i_3$ denote the mesh currents in meshes 1, 2 and 3, respectively.

Determine the values of these mesh currents:

$i_1$ = ____2____ A and $i_2$ = ____–3_____ A

Determine the value of the resistance $R$:

$R$ = _____5_____ Ω