

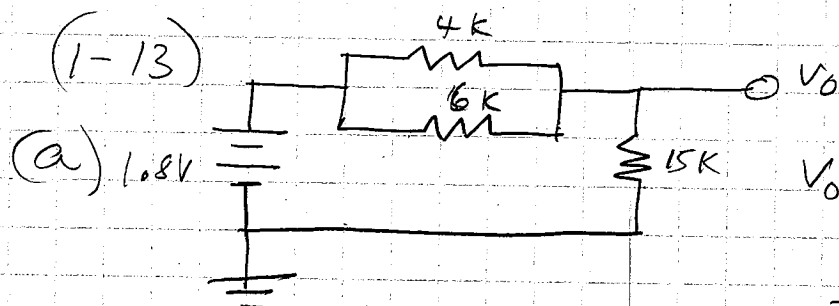
$$(1.9) \quad C = \overline{(A+B)} B$$

$$= \overline{A B} B$$

$$= A + B + \overline{B} = A + 1 = 1 \quad (C=1)$$

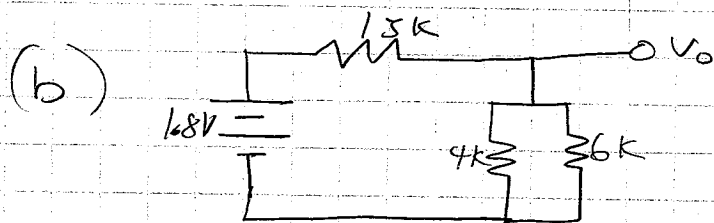
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ECE 321  
HW-1  
23 AUG 2012

$$(1.11) \quad R1 + (R5 + R6) // (R2 + R3 // R4) + R7$$



$$V_0 = \left( \frac{15k}{4k // 6k + 15k} \right) (1.8V)$$

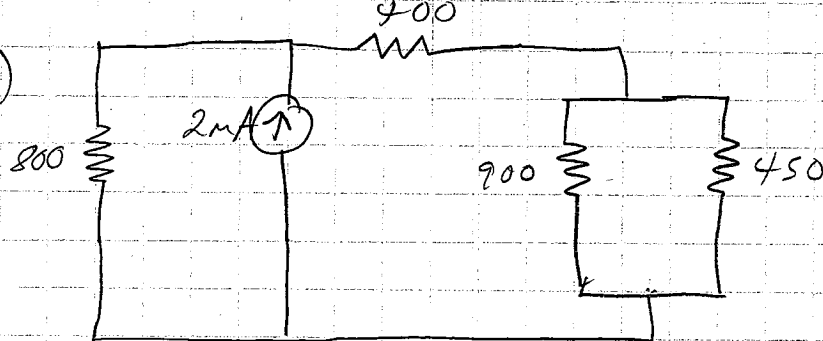
$$= \boxed{1.552V}$$



$$V_0 = \frac{4k // 6k}{4k // 6k + 15k} (1.8V)$$

$$= \boxed{248mV}$$

(1-17)



$$(a) I_{450} = \left( \frac{900}{900+450} \right) \frac{(2mA) [800 // (400 + 900 // 450)]}{(400 + 900 // 450)}$$

$$= (0.66) \left[ \frac{(0.746)}{700} \right] = \boxed{711 \mu A}$$

$$(b) I_{800} = \frac{400 + 900 // 450}{(400 + 900 // 450) + 800} (2mA)$$

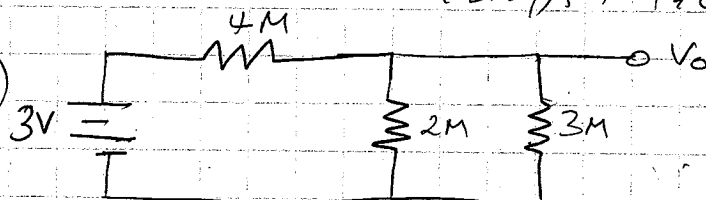
$$= 933 \mu A$$

$$(c) I_{800} + I_{400} = 933 \mu A + \frac{800}{800 + (400 + 900 // 450)} (2mA)$$

$$= 933 \mu A + (0.533) (2mA)$$

$$= 933 \mu A + 1.066 mA = \boxed{2 mA} \checkmark$$

(1-18)

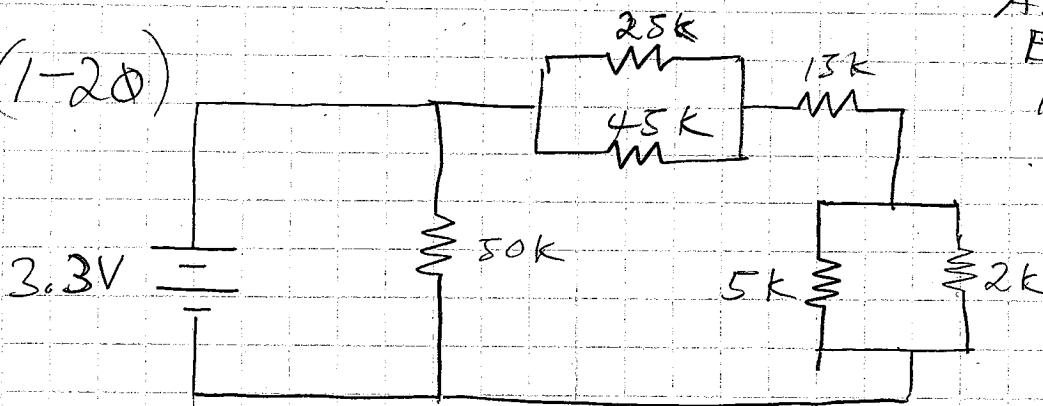


$$(a) V_o = \left( \frac{3M // 2M}{3M // 2M + 4M} \right) 3V = \boxed{692.3 mV}$$

$$(b) I_{2M} = \left( \frac{3M}{3M + 2M} \right) \left( \frac{3V}{4M + 2M // 3M} \right)$$

$$= (0.6) (0.5769) = \boxed{346.2 mA}$$

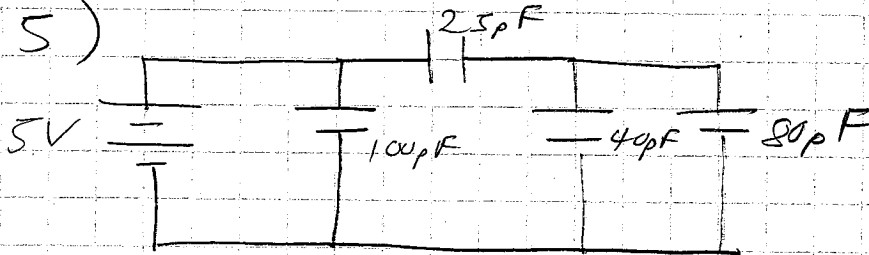
(1-20)



$$I_{2k} = \left( \frac{5k}{5k+2k} \right) \left( \frac{50k}{50k + 25k//45k + 15k + 5k//2k} \right) \frac{3.3V}{1}$$

$$I_{2k} = \boxed{719.7 \mu A}$$

(1-25)

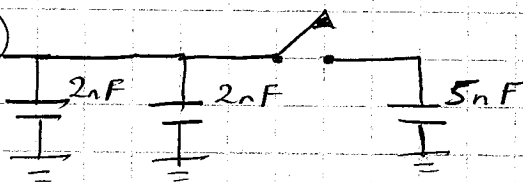


$$(a) \quad C_{eq} = 120.7 pF$$

$$W = \frac{1}{2} (120.7 pF) (5V)^2 = \boxed{1.509 \mu J}$$

$$(b) \quad V_0 = \left( \frac{25 pF}{40 pF + 80 pF} \right) (5V) = \boxed{1.042 V}$$

(1-27)



$$E_{2n} = \frac{1}{2} (4nF) (3)^2 = 18 nJ$$

$$E_{5nF} = \frac{1}{2} (5nF) (1.2)^2 = \boxed{3.6 nJ}$$

$$E_T = 21.6 nJ$$

$$C_{EQ} = 9 nF \Rightarrow V_{Fmax} = \sqrt{\frac{E}{\frac{1}{2} C_{eq}}} = \boxed{2.191 V}$$