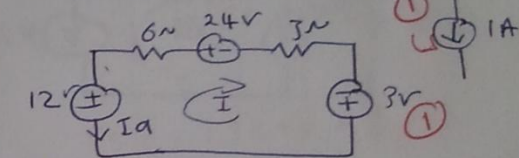
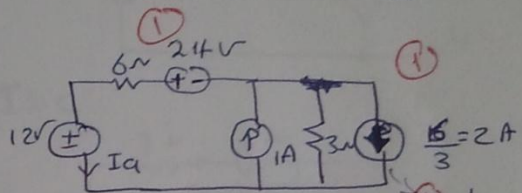
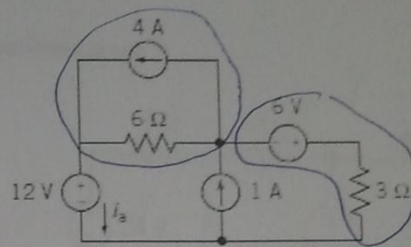


**Question 2 : ( 6 marks)**

Using source transformation find  $i_a$



KVL

$$-12 + (6+3)I + 24 - 3 = 0$$

$$12 - 3 + 9I = 0$$

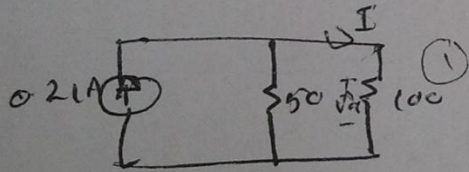
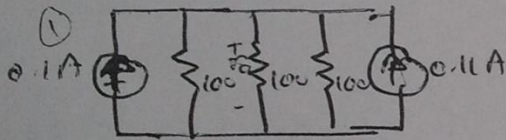
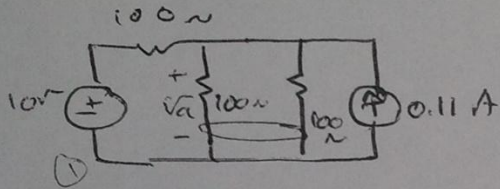
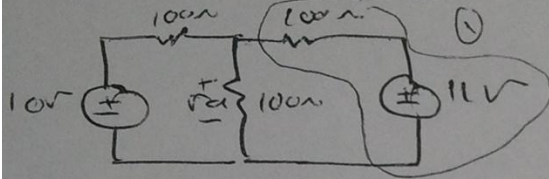
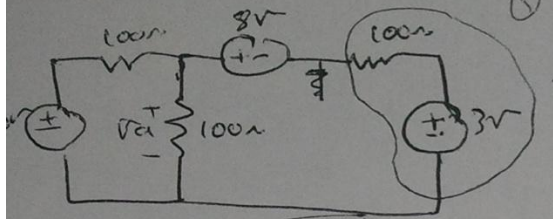
$$9 + 9I = 0$$

$$I = -\frac{9}{9} = -1A$$

$$I_a = 1A$$

**Question 2 : ( 6 marks)**

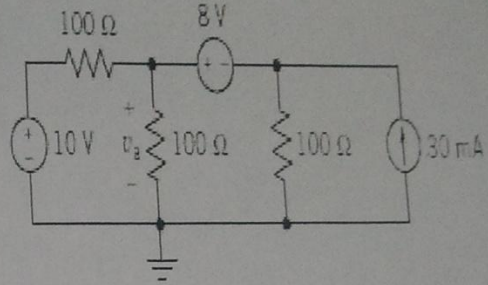
Using source transformation find  $v_a$



$$I = \frac{0.21 \times 50}{50 + 100} = 0.07 \text{ A}$$

$$v_a = 0.07 \times 100 = 7 \text{ V}$$

①



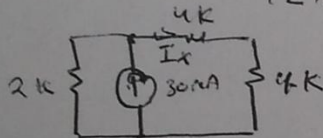
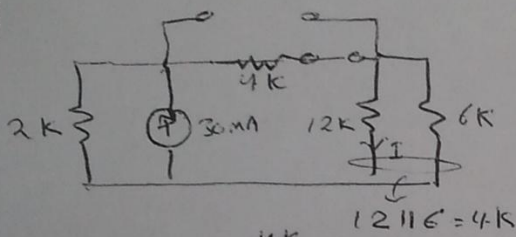


Typical Answers of the Second Exam  
2013/2014 Second Semester

Question 1 : (6 marks)

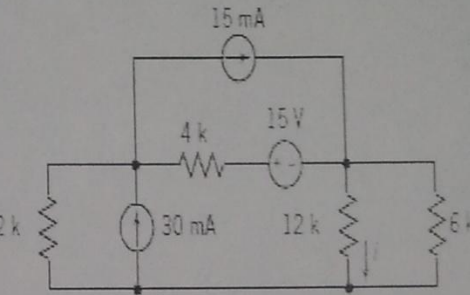
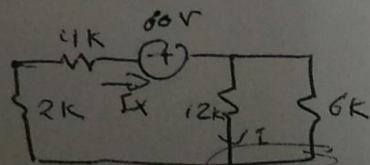
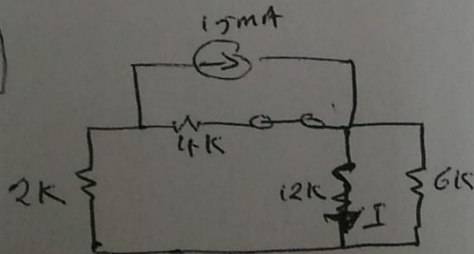
Using super position find i

$$I = I_{30mA} + I_{15mA} + I_{15V}$$



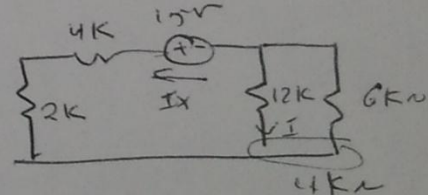
$$I_x = \frac{(30mA)(2K)}{(2+8)K} = 6mA$$

$$I = \frac{(6mA)(6)K}{(6+12)K} = 2mA$$



$$I = \frac{(6mA)(6)K}{(6+12)K} = 2mA$$

S = 15V



$$I_x = \frac{15}{(6+4)K} = \frac{3}{2} mA$$

$$I = \frac{(\frac{3}{2} mA)(6K)}{(12+6)K} = -\frac{1}{2} mA$$

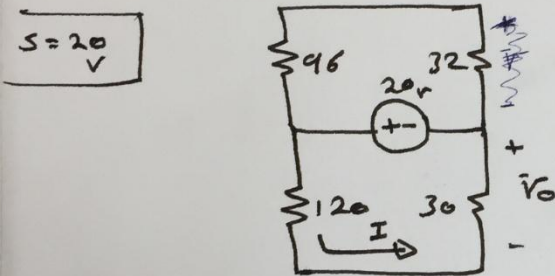
$$I = (2 + 2 - \frac{1}{2}) mA = (4 - \frac{1}{2}) mA = 3.5 mA$$



**Question 1 : ( 8 marks)**

Using super position find value of  $v_o$

$$V_o = \overset{S=20V}{\downarrow} \bar{V}_o + \overset{S=0.3A}{\downarrow} \bar{V}_o$$



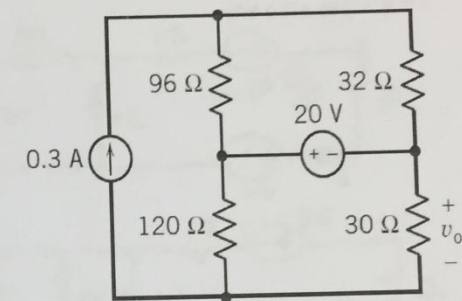
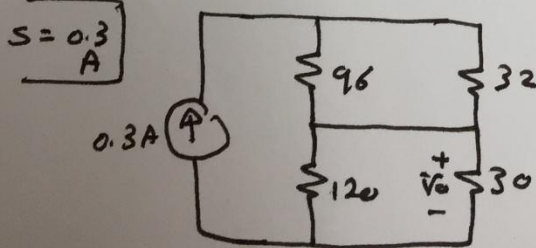
$$I = \frac{20}{120+30} = \frac{20}{150}$$

$$I = 0.133 \text{ A}$$

$$\bar{V}_o = -30 \times 0.133$$

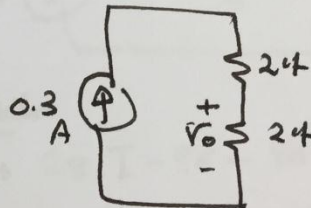
$$\bar{V}_o \approx -4 \text{ V}$$

$\approx 3.5$



$$R_{eq1} = 96 \parallel 32 = \frac{96 \times 32}{96 + 32} = \frac{3072}{128} = 24 \Omega$$

$$R_{eq2} = 120 \parallel 30 = \frac{120 \times 30}{120 + 30} = \frac{3600}{150} = 24 \Omega$$



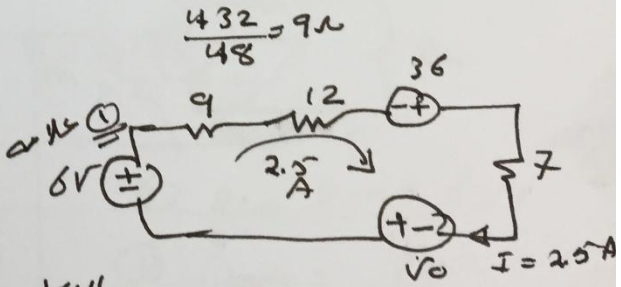
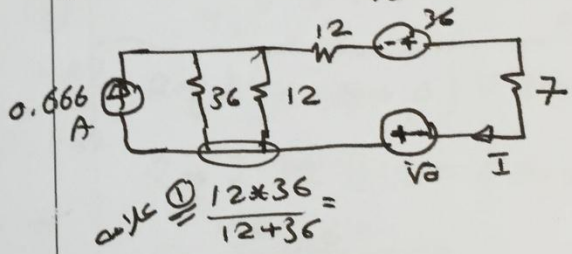
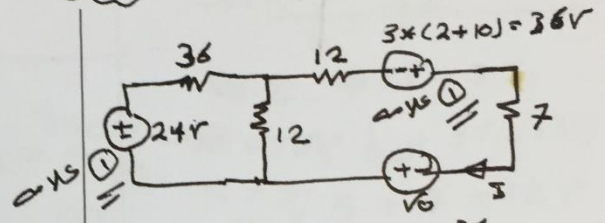
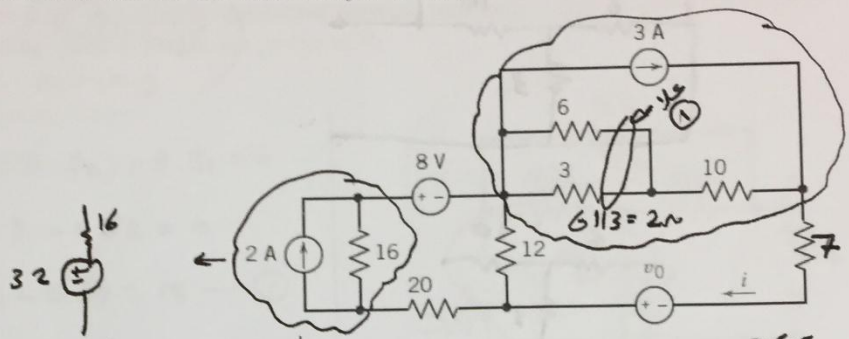
$$\bar{V}_o = 0.3 \times 24 = 7.2 \text{ V}$$

$$V_o = -4 + 7.2 = 3.2 \text{ V}$$

$\approx 3.5$  (To be continued)

Question 2 : ( 8 marks)

Using source transformation find value of  $v_o$  if  $i = 2.5 \text{ A}$



KVL

$$-6 + 28 \cdot I - 36 - v_o = 0 \quad \text{--- (1)}$$

$$-42 + 28 \cdot 2.5 - v_o = 0$$

$$-42 + 70 - v_o = 0$$

(To be continued)

$$+28 - v_o = 0 \quad \text{--- (2)}$$

$$v_o = 28 \text{ V}$$

