Princess Sumaya جامعة الأميرة سميّة للتكنولوجيا University for Technology

King Abdullah II School of Engineering

EE21221
Electric Circuits (1)
Section #3

Quiz #5
Monday 10/1/2022

Name: ……

Q.1) In the circuit shown in Figure Q.1, let $v_C(0)$=15 V. Find Vc for t>0: [4-Points]

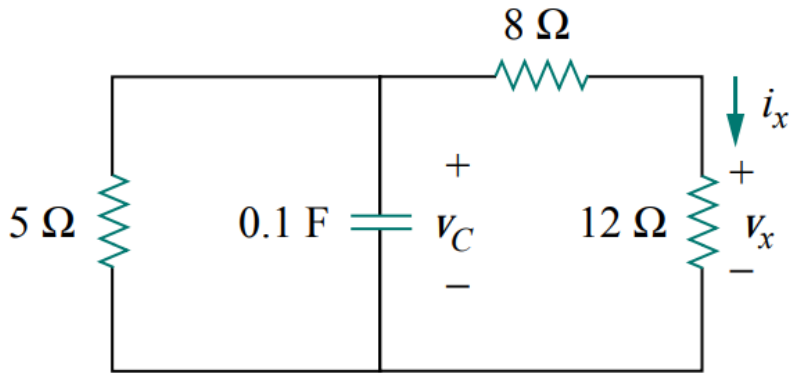
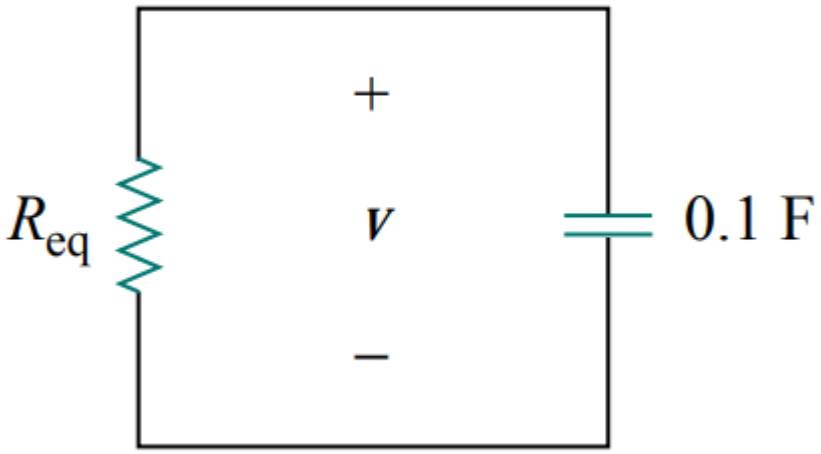


Figure Q.1

Solution:



$$R_{eq} = \frac{20 \times 5}{20 + 5} = 4\ \Omega$$

$$\tau = R_{eq}C = 4(0.1) = 0.4 \text{ s}$$

$$v = v(0)e^{-t/\tau} = 15e^{-t/0.4} \text{ V}$$

Q.2) The switch in the circuit shown in Figure Q.2 has been closed for a long time. At t = 0 the switch is opened. Calculate i(0+) in amperes. [6-Points]

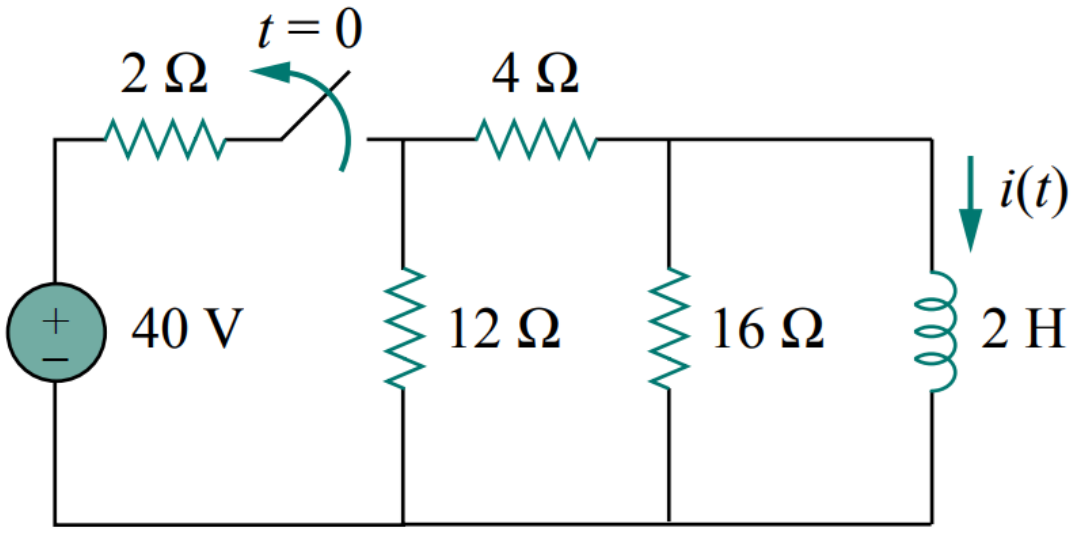
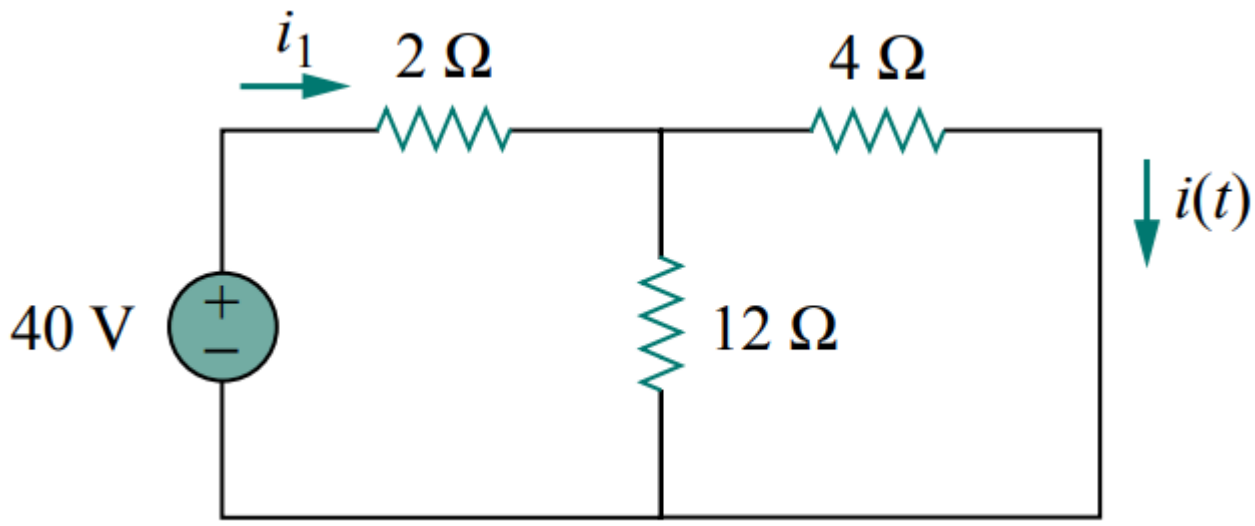


Figure Q.2

Solution:



$$\frac{4 \times 12}{4 + 12} = 3\ \Omega$$

$$i_1 = \frac{40}{2 + 3} = 8\ \text{A}$$

using current division

$$t < 0$$

$$i(t) = \frac{12}{12 + 4} i_1 = 6\ \text{A}$$

$$i(0) = i(0^-) = 6\ \text{A}$$