2023 Fall

Quiz 1

Q1. -8 W

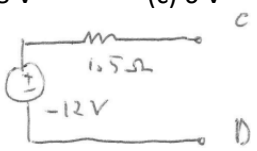
Q2. (a) -4 A (b) -8 V

Q3. (a) -3 A (b) 15 V

Q4. (a) -3 A (b) 2 V (c) -12 V

Quiz 2

Q1. (a) 9V (b) 8 V (c) 6 V (d) 7.5 V

Q2. (a) 12 A (b) 

(c) 3 Ω

Quiz 3

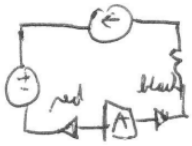
Q1. (a) $3\sqrt{2}\,e^{j\frac{3\pi}{4}}$ A (b) 

(c) $-6\sqrt{2}+10$ V

Q2. (a) 2 A (b) 18 V (c) Zx = -9j value = 1/90 F

Final – A

Q1. (a) 4 A (b) -8 V

Q2. (a) -5 V (b) P = -24 W 

Q3. (a) 6 V (b) -2 A (c) 3 A

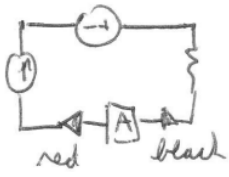
Q4. (a) $2\,e^{-j\frac{\pi}{4}}$ A (b) $\sqrt{5}$ A (c) $3-2\sqrt{2}$ V

Q5. (a) 2.5 W (b) -5 VAR (c) 0 W (d) 2.5 W

Q6. (a) 4.5 V (c) 6 A

Final – B

Q1. (a) 11 V (b) -4 A

Q2. (a) -0.5 A (b) P = -30 W 

Q3. (a) 6 V (b) 2 A (c) 12 V

Q4. (a) $3\,e^{-j\frac{\pi}{4}}$ V (b) $\sqrt{10}$ V (c) $3-3\sqrt{2}$ A

Q5. (a) 4.5 W (b) 9 VAR (c) 0 W (d) 4.5 W

Q6. (a) 1.5 A (c) 2 V

2022 Fall

Quiz 1

Q1. (a) -18 W (b) -7 A

Q2. (a) 4 V (b) -2 A

Q3. (a) -4 A (b) -7 V

Quiz 2

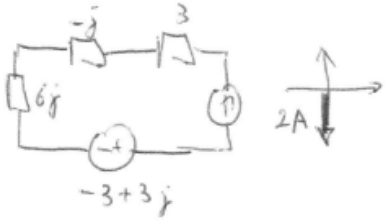
Q1. (a) Vth = 6 V Rth = 3 Ω (b) k = -2 V/A

Q2. (a) 0 V (b) -4 V (c) 32 V (d) v2(t) = 4 V, t > 2s

Quiz 3

Q1. (a) $4\sqrt{2}\cos\left(5t+\frac{3\pi}{4}\right)$ A (b) $-5-4\sqrt{2}$ V

Q2. (a) 5 – 9j (b) $3\sqrt{2}$ V (c)



Final – A

Q1. (a) X = -8V Y = -3 A va = -2 V P = -32 W (b) Rth = -4 Ω

Q2. (a) $i_a(0^-)$ = -3 A $i_a(0^+)$ = -3 A

(b) $i_b(0^+)$ = 6.5 A $i_b(2)$ = 9 A $i_b(\infty)$ = 9 A

(c) $i_c(4)$ = 65 A $i_c(6)$ = 125 A

Q3. (a) $i_{S1}(\frac{\pi}{20})$ = 3 A (b) $v_a\left(\frac{\pi}{20}\right) = -4+12\sqrt{2}$ V (c) i_{amax} = 3 $\sqrt{2}$ A

Q4. (a) Ps = 0.3 W (b) P1 = 0W (c) i_{xRMS} = 0.5 $\sqrt{2}$ A

Q5. (a) i_L = 4 A R_N = 3 Ω v_L = 9 V

(b) τ_1 = 9 s τ_2 = 9 s

Final – B

Q1. (a) X = -12 V Y = -6 A (b) v_a = 4 V (c) P = -10 W

(d) v_b = -8 V i_a = -3 A (e) R_{th} = -1/4 Ω

Q2. (a) $v_c(0^-)$ = -8 V $v_a(0^-)$ = -1.5 V (b) $v_a(2^-)$ = 5 V (c) $v_a(6)$ = 210 V

Q3. (a) $V_x = 8\,e^{-j\frac{\pi}{4}}$ (b) i_b = -2.5 A (c) $v_S(\frac{\pi}{10})$ = -2 V $i_c(\frac{\pi}{10})$ = 1.5 A

(d) $i_d(\frac{\pi}{10})$ = -4 A (e) v_{amax} = $\sqrt{5}$ V

Q4. (a) V_a = -6 V (b) P_S = 64 W

(c) P_S = 64 W P_2 = 0 W $|V_x|$ = 16 V i_{xRMS} = $4\sqrt{2}$ A

Q5. (a) R_N = 2 Ω

(b) τ = 3 s

2022 Winter

Quiz 1

Q1. (a) va = -15 V (b) P1 = -9 W (c) ia = 1 A (d) P2 = -18 W

Q2. (a) ib = 0 (b) X = 2 A (c) Y = 2 V

Quiz 2

Q1. (a) vx = 1 V (b) vy = -1 V (c) iy = 0.5 A

Q2. (a) Rth = 3 ohm (b) ix = 6 A (c) ix = 2 A

Quiz 3

Q1. $9 - e^{\frac{-(t-2s)}{2.5\,ms}}$ A

Q2. (a) va(0+) = 11 V (b) vb(0+) = 12 V (c) va(6s) = 5 V (d) vb(6s) = -3 V

Quiz 4

Q1. (a) $1 - 2\sqrt{2}$ V (b) $\frac{-\pi}{20}$ s

Q2. (a) R = 3 ohm, L = 0.3 H (b) $\frac{-\pi}{4}$ (c) Z3 = 2j ohm

Final

Q1. (a) 8 A (b) -6 V (c) -2 A (d) -4 V

Q2. (a) 6 A (b) -5 A

Q3. (a) 50 W (b) 4.5 A (c) 90 W

Q4. (a) 24 V (b) 8 V (c) 0.4 ms

Q5. (a) 1.5 A (b) -4 V (c) 8 V (d) 0 A (e) -11 V (f) 1 V

Q6. (a) -10j VA (b) $5\sqrt{2}$ V (c) inductor, 8 mH

2021 Fall

Quiz 1

Q1. Req = 2/3 ohm

Q2. (a) X = -12 V (b) va = 6 V

Q3. (a) P1 = -30 W (b) P2 = -40 W (c) X = -2.5 A (d) [in series with resistor]

Quiz 2

Q1. (a) ia = 1 A (b) i1 = -2 A V1 = -2 V

Q2. (a) IN = -2 A RN = 4 ohm (b) va = -12 V

Quiz 3

Q1. (a) 4 V (b) $2e^{\frac{-(t-3s)}{1.5s}} + 6$ V

Q2. (a) -0.8 V (b) -0.6 V

Quiz 4

Q1. $20 - \frac{30}{\sqrt{2}}$ V

Q2. (a) $\sqrt{7}$ A (b) π rad (c) $\frac{6000}{\sqrt{7}}$ rad/s

Final - A

Q1. -10 V

Q2. (a) 12 A (b) -64 W (c) 0 W

Q3. (a) -4 ohm (b) IN = 4 A RN = 6 ohm

Q4. (a) 3 A (b) 1.5 A (c) 18 A (d) 0 A

Q5. (a) 3.5 V (b) $-6.5\, e^{\frac{-3\pi}{2}} + 10$ V

Q6. (a) magnitude 12 V and phase $\frac{13\pi}{12}$ rad (b) 9/5 W (c) 1.8 + j 21.6 VA

Final - B

Q1. -6 V

Q2. (a) -3 A (b) -18 W (c) 0 W

Q3. (a) -5 ohm (b) 9/4 ohm

Q4. (a) 2 V (b) -2 V (c) $-2\, e^{-2000} + 4$ V (d) 0 V

Q5. (a) 2 A (b) $2 - 3\pi$ A

Q6. (a) magnitude 1 A and phase $\frac{\pi}{12}$ rad (b) 0.8j VA (c) Sc1+Sc2 = -1.2j VA PR = 0.2 W

2021 Winter

Quiz 1

Q1. X = 0 A Y = -2 V

Q2. X = -1 V P = 2 W

Q3. vx = 3 V vy = -1 V

Q4. RN = 2 ohm P = 0.125 W

Quiz 2

Q1. (a) 2 A (b) $-4e^{\frac{-(t+7s)}{2\,ns}}$ A

Q2. (a) 7 V (b) 0.5 A

Q3. (a) $\frac{-5\pi}{60}$ s (b) inductor (c) $0.15\sqrt{2}$ A

Final

Q1. (a) 1.5V (b) 0 A (c) va =-2 V, ia = -7 A

Q2. (a) Rth = -2 ohm, Vth = 0 V (b) va = -2 V

Q3. (a) 3A (b) -6 V (c) $6e^{-2}+3$ A (d) $6e^{-2}-18$ V

Q4. (a) $2\sqrt{5}$ A (b) S = 80 – 40j VA (c) P = -80W (d) K = 0.4 s

Q5. (a) $-1.5\sqrt{3}$ V (b) $0.8\cos(100t-60°)$ A (c) $-3+\sqrt{13}$ V

2020 Fall

Quiz 1 – section A

Q1. X = - 1.5 A Y = -2 V

Q2. P1 = 0 W P2 = 0.5 W

Quiz 1 – section B

Q1. ix = - 0.5 A X = -3 V

Q2. P1 = -2 W P2 = 2 W X = -3 A

Quiz 2 – section A

Q1. Rth = 0.5 ohm RL = 1.5 ohm

Q2. (a) ia = 2 A (b) ia = 4 A

Quiz 2 – section B

Q1. (a) va = 2 V (b) va = -2 V

Q2. Rth = 1.5 ohm RL = 1.5 ohm

Quiz 3 – section A

Q1. (a) -6 A (b) $-2e^{\frac{-(t-3s)}{6\,ps}}$ A

Q2. (a) 4 A (b) $4e^{-1.5}+2$ A

Quiz 3 – section B

Q1. (a) -6 V (b) $-4e^{\frac{-(t-5s)}{3\,ns}}$ V

Q2. (a) $3e^{0.5}$ V (b) 4 V

Quiz 4 – section A

Q1. $9+4\sqrt{2}\cos(10t-65°)$ V

Q2. (a) $\frac{\pi}{60}$ s (b) $\frac{\sqrt{3}}{10}$ H

Quiz 4 – section B

Q1. $-1+\sqrt{2}\cos(10t-65°)$ A

Q2. (a) $\frac{-\pi}{20}$ s (b) $\frac{3}{80}$ F

Final

Q1. (a) $2+1.5\sqrt{2}\cos(2t-45°)$ V (b) 5π V (c) -1.5 V (d) $-1.5e^{\frac{-5\pi}{3}}$ V

Q2. (a) 4j VA (b) $12+j3\sqrt{3}$ VA (c) $j(3\sqrt{3}-4)$ VA (d) inductor

Q3. (a) 5 V (b) Vth = 5V, Rth = 2 ohm (c) -5/4 A

Q4. (a) $27e^{\frac{-(t-2s)}{200\,ms}}-18$ V (b) -24 W

Q5. $\sqrt{340}$ V

2020 Spring

Quiz 1

Q1. X = 0 A Y = -3 V P = 16 W supplied

Q2. vx = -5 V P1 = 45 W received P2 = 5 W received

Quiz 2

Q1. ix = 1 A vx = -2 V

Q2. (a) Vth = -2 V Rth = 4 ohm (b) RL = 7 ohm

Quiz 3

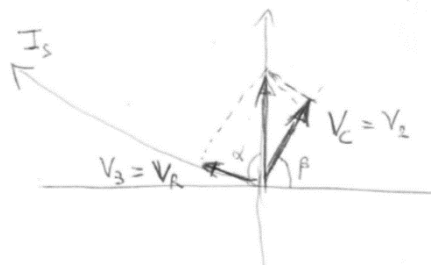
Q1. (a) ia(5-) = 6 A (b) $e^{\frac{-(t-5s)}{6\,ms}} + 8$ A

Q2. (a) X = 6 V (b) X = $5e^{-0.25} + 4$ V

Quiz 4

Q1. $-1 - 1.5\sqrt{2}\cos(10t)$ A

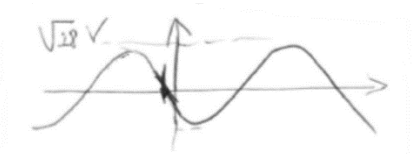
Q2. (a)



(b) v2 = $-4\sqrt{3}$ V

(c) |v1| = $\sqrt{28}$ V

(d)

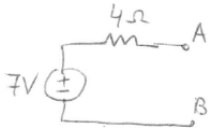


Final

Q1. (a) I1 = $2e^{-j\frac{\pi}{2}}$ A I2 = $3e^{j\frac{\pi}{2}}$ A I2 = $1.5e^{j\frac{\pi}{2}}$ A (b) S = 15 VA

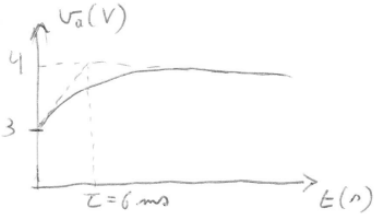
Q2. (a) P = 6.5 W (b)

Q3. (a)



(b) 1 A

Q4. va(t) = $-e^{\frac{-t}{6\,ms}} + 4$ V



Q5. $3\cos\left(2t + \frac{\pi}{3}\right) + 3\sqrt{2}\cos\left(4t - \frac{\pi}{4}\right)$ A

2019 Fall

Quiz 1 – section A

Q1. X = - 2.5V P1 = 0 W

Q2. va = 5 V

Q3. P3 = -5 W P1 = -2 W, P2 = 5 W or P1 = 18 W, P2 = -15 W

Quiz 1 – section B

Q1. X = - 3V P1 = 0 W

Q2. ia = 4 A

Q3. P3 = -6 W P1 = 0 W, P2 = 3 W or P1 = 18 W, P2 = -15 W

Quiz 2 – section A

Q1. v1 = -1V i1 = -1A

Q2. k = 3 A/A

Quiz 2 – section B

Q1. v1 = -2V i1 = 1A

Q2. (a) Rth = 6 ohm (b) R = 4 ohm

Quiz 3 – section A

Q1. (a) 3 A (b) $2e^{\frac{-(t-2s)}{2\,us}} + 4$ A

Q2. (a) -2 V (b) -8 V

Q3. (a) 1.25 A (b) 5 s (c) 5 s

Quiz 3 – section B

Q1. (a) 4 A (b) $-3e^{\frac{-(t-2s)}{1.5\,us}} + 3$ A

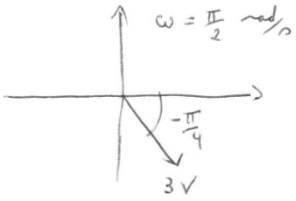
Q2. (a) -2 V (b) -5 mA

Q3. (a) 5 V (b) 2.5 s (c) 2.5 s

Quiz 4 – section A

Q1. $-2 + 1.5\sqrt{2}\cos\left(1000t - \frac{3\pi}{4}\right)$ A

Q2.



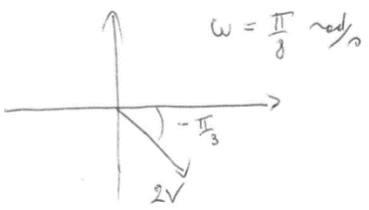
Q3. 

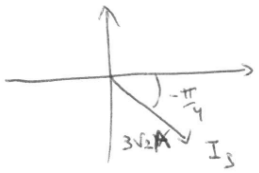
(b) $-3\sqrt{2}$ V

Quiz 4 – section B

Q1. $-4 + 1.5\sqrt{2}\cos\left(1000t - \frac{3\pi}{4}\right)$ V

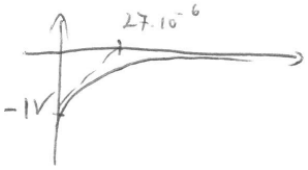
Q2.



Q3.  (b) $-4.5\sqrt{2}$ V

Final - section A

Q1. (a) Rth = 2 ohm, Vth = 2 V (b) 0.75 A

Q2. (a) $-e^{\frac{-t}{27\,\mu s}}$ V (b) 

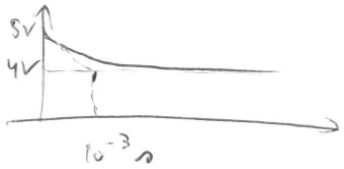
Q3. $1.5 + 6\sqrt{2}\cos\left(1000t - \frac{3\pi}{4}\right)$ A

Q4. (a) I1 = $-10e^{j\frac{9\pi}{20}}$ A, I2 = $-10\sqrt{2}e^{j\frac{7\pi}{10}}$A , I3 = $-5e^{j\frac{9\pi}{20}}$A (b) 50 + 50j VA

Q5. (a) X = 2 A, Y = 4 V (b) 1+j ohm (c) 2 W

Final – section B

Q1. (a) Rth = 2 ohm, Vth = 4 V (b) 1.5 A

Q2. (a) $e^{\frac{-t}{1ms}} + 4$ V (b) 

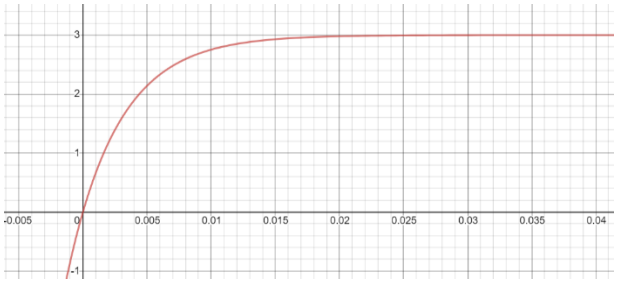
Q3. $-2 + 5\sqrt{2}\cos\left(1000t - \frac{3\pi}{4}\right)$ A

Q4. (a) I1 = $6\sqrt{2}e^{j\frac{9\pi}{10}}$A , I2 = $24e^{j\frac{13\pi}{20}}$A , I3 = $3\sqrt{2}e^{j\frac{9\pi}{10}}$ A (b) 72 - 36j VA

Q5. (a) X = 1 A, Y = 1 V (b) 1-j ohm (c) 0.25 W

Final – Practice

Q1. (a) V_{th} = -4.5 V R_{th} = .75 Ω (b) -2 A

Q2. (a) $v(t) = -3e^{-\frac{t}{4ms}} + 3$ V (b) 

Q3. $i(t) = 2.5\sqrt{2}cos\left(10t - \frac{\pi}{12}\right) - 3$ A

Q4. (a) $I1 = 2\sqrt{2}e^{\frac{6\pi}{5}j}$ A $I1 = 2e^{\frac{-\pi}{20}j}$ A $I1 = \sqrt{2}e^{\frac{-3\pi}{10}j}$ A

(b) S=3+j

Q5. (a) R_L=1 Ω K_L=j Ω (b) Inductor L=.1 H (c) P_{avg} = .25 W

2019 Winter

Quiz 1

Q1. 18 W -6 W

Q2. -4 A 10 V

Q3. 3 V

Quiz 2

Q1. 8 V 2 A

Q2. -5 V/A 1.5 ohm

Quiz 3

Q1. (a) 6 A (b) $4e^{\frac{-(t-2s)}{9\,ms}} + 6$ A

Q2. 13 V 13 V 13/e V

Quiz 4

Q1. (a) $-5\sqrt{2}$ V (b) 2.5 A (c) C = 1/2 F and C = 3/2 F

Q2. $\frac{3}{2} + \frac{3}{16}\sqrt{2}$ V

Final

Q1a. -6 V

Q1b. -2 V 0 A

Q1c. -4 A

Q2a. va = vb = vc = 4 V

Q2b. va = 8 V vb = $8e^{\frac{-t}{8\,\mu s}} - 4$ V vc = $4 - \frac{10^6}{s}t$ V

Q3a. V1 = $2e^{\frac{-j\pi}{10}}$ V V2 = 2 V

Q4a. 2 V

Q4b. 21 W

Q5a. 3.6 V

Q5b. $6 + \sqrt{6}/4$ V

Q6a. P = -6 W Q = 4 VAR

Q6b. X = 0.4 H (inductor)

2018 Fall

Quiz 1

Q1. -3 V

Q2. -4 V 2 A 0.25 Ω

Q3. -3 A 2 V

Q4. 2 V -2 W 0 V/A 0.25 V/A

Quiz 2

Q1. -10 A

Q2. 4 Ω 4

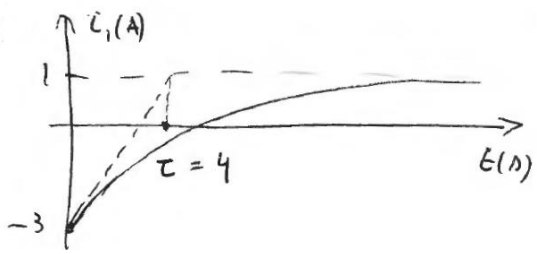
Q3. 1 A

Q4. 2 answers: 6 A and -1.5 A

Quiz 3

Q1. 2 A $-15e^{\frac{-(t-2s)}{4\,\mu s}} + 5$ A

Q2.



Q3. $\sqrt{2}\cos\left(1000t + \frac{3\pi}{4}\right) - 2$ A

Q4. $-\sqrt{3}/2$ A -0.25 A

Final

Q1a. 0 A 0 A

Q1b. -3 A -3 A

Q2a. -8A

Q2b. -3 V

Q2c. 7 V 6 Ω

Q3a. $2\sqrt{2}$ A $-2\sqrt{2}$ A

Q3b. $\sqrt{6}$ A $4\sqrt{3}$ V

Q3c. $3\cos\left(\frac{2\pi}{20}t - \frac{3\pi}{10}\right)$ V

Q4. 1 A -2 W

Q5. 4 A $e^{\frac{-(t-1s)}{2.5\,ms}} + 3$ A

Q6. 90j VA 1.2 – 1.6j Ω

Q7. 0 A $\sqrt{3}$ A $-\sqrt{3}/3$ A

2017 Fall

Quiz 1 – section A

Q1. 1 W -12 W 9 W 2 W

Q2. 2 V 0 A

Quiz 1 – section B

Q1. -8 W 0 0 8 W

Q2. 0 V -2 A

Quiz 2 – section A

Q1. 0.5 A

Q2. 0.25 Ω

Quiz 2 – section B

Q1. -2 A

Q2. 4 Ω

Quiz 3 – section A

Q1. 2 µJ $-e^{\frac{-t}{10^{-3}}}$ 0 V 3 A

Q2. $2\cos(10t-\frac{\pi}{2})$ A

Quiz 3 – section B

Q1. 4 mJ $-3e^{\frac{-t}{4.10^{-6}}}$ 2 V -1 A

Q2. $2\sqrt{2}\cos(10t+\frac{\pi}{4})$ V

Final – section A

Q1. 2 A 4 V -4 W 2.4 A $-4.10^{-3}.e^{\frac{-t}{4.10^{-3}}}+10^{-3}$ A

Q2. -2 A

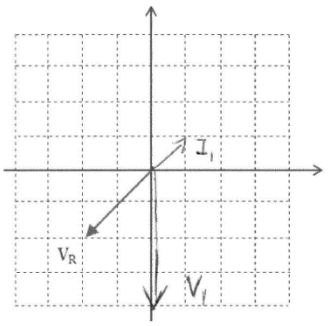
Q3. -0.25 A -4.5 W

Q4. $\sqrt{2}\cos(10t-\frac{3\pi}{4})$ A

Q5. 10 V 10 V 40 Ω 2/3 F

Q6. $\frac{CaV1+CbV2}{Ca+Cb}$ $\frac{CaV1+CbV2}{Ca+Cb}$ $\frac{CaCb}{Ca+Cb}\frac{(V1-V2)^2}{2}$

Q7. Capacitor 2 Ω 0.05 F 0.4j VA



Final – section B

Q1. 0 A -2 V -2 A 9 mJ 0<t<1s and 2s<t<3s $2.10^{-3}.e^{-j\frac{\pi}{4}}$ A

Q2. 1 A 12 W

Q3. Vth = 4 V, Rth = -1 Ω 16 Ω

Q4. 6 V 6 V 0 A 4 A $-e^{\frac{-t}{6.10^{-6}}}+3$ A

Q5. $2\cos\left(10t-\frac{\pi}{4}\right)+2\cos\left(5t+\frac{3\pi}{4}\right)+1$ A

Q6. 0 W 0.5-0.5j VA capacitor 0.05 F

Q7. e^{20t} V