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

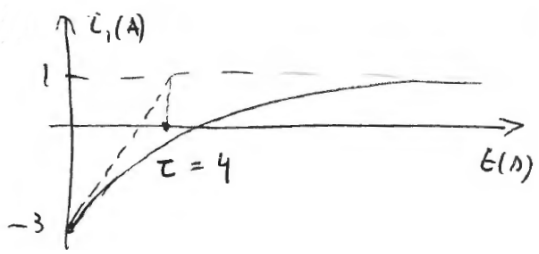
Q3. 1 A

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

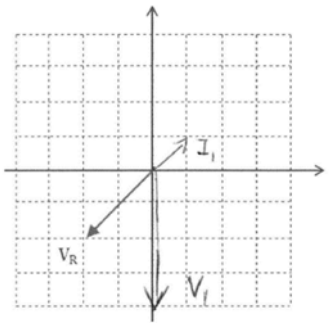
Q3. -0.25 A -4.5 W

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

2017 Spring

Quiz 1

Q1. 80 W absorbed, 480 W absorbed, 80 W absorbed, 640 W supplied

Quiz 2

Q1. Don't need to know

Q2. 0.5 A -1/6 A 0 V 12 V

Midterm

Q1. 36 W, 20 W, 162 W, 66 W supplied and 30 W, 42 W, 108 W, 104 W absorbed

Q2. 13/7 A, 2/7 A, 9/7 A

Q3. 41 kΩ 121/164 mW

Final

Q1. 76.8 W supplied -40.8 W supplied

Q2. -4 V -4/3 mA

Q3. $\frac{12}{13}.e^{\frac{-140t}{39}}$ V

Q4. $0.107\cos(40t - 9.9°) + 0.55$ A

Q5. $9.3\cos(5000t - 97°)$ V

Q6. 20 Ω 31.25 W 197.5 W

2016 Fall

Quiz 1

Q1. 0.5 A 0.25 A 2 V 4 V -0.5 A

Quiz 2

Q1. 7.5 V 34.5 V "current sources in series" Add resistor in parallel for current sources

Quiz 3

Q1. -1.273 A

Quiz 4

Q1. 156.7 mA 250.0 mA 120.8 mA 220.8 mA

Quiz 5

Q1. Don't need to know

Quiz 6

Q1. 39.6 uJ 158.4 uJ

Quiz 7

Q1. 0 Is + Vs/R1 -Is.R1.R2/(R1+R2) Is + Vs/R1 0.5.L.(Vs/R1)^2

Quiz 8

Q1. 1.327-17.912j capacitive 5398.77 W

Midterm

Q1. $-8\cos(3t)$ V $16\cos(3t)^2$ W $4\cos(3t)$ W $-16\cos(3t)^2 - 4\cos(3t)$ W

V source 1 Ω

Q2. (V4-Vs1)/R2 – Is + (V4-Vs1)/R3 + V4/R4 = 0 5.324 V

Q3. (R1+R2-G).ia + (-R2).ib = -G.Is (G-R2).ia + (R2+3).ib = G.Is – V2 + V1

Q4. 4 Ω 4/5 Ω 4 Ω

Q5. … 1.639 A 83.3 mA

Q6. Vth = 2V, Rth = 8/3 Ω 3/8 W no power

Midterm Practice

Q1. -1 V -0.125 A No Yes

Q2. -4 V 0 -8 W

Q3. 16.i1 – 4.i2 = -20 -4.i1 + 12.i2 = 10

Q4. V1.(-1/R3 - 1/R1) + V2.(1/R1 + 1/R3 + 1/R4 + 4V2/(R1.R4)) = -Is
V1.(1/R1 + 1/R2 + 1/R3) + V2.(-1/R1 - 1/R3 - 4/(R1.R4)) = 0

Q5. Vth = 2V, Rth = 1Ω IN = 2A, RN = 1Ω

Final

Q1. $5.e^{10t-36.87^\circ}$ V 5 V 3.536 V 0.6283 s 2.828Ω resistor + 0.2828H inductor

Q2. Don't need to know

Q3. Don't need to know

Q4. $-6.75.(1-e^{-\frac{t-2}{12}})$ V when t > 2s 0 when 0 < t < 2s infinite current

Q5. 0.7574 V $0.6202\cos(5t+82.88^\circ)-5.571\sin(4t+66.8^\circ)$ V 6 seconds

Q6. $4.905\cos(5t-60.95^\circ)$ A $Zth = 2.172\cdot e^{-j87.51^\circ}\ \Omega$ $Vth = 10.78\cdot e^{-j153.5^\circ}\ V$

Q7. Don't need to know

Q8. 3.125 W 2 Ω 0 F any L
2 Ω 0.5 mF 0 H 1.118 W 1.5625-1.5625j VA

Q9. -6 $\cos(10t+90^\circ)$ A

Final Practice

Q1. Don't need to know

Q2. $1+\cos\left(\frac{\pi}{2}t+\frac{\pi}{2}\right)$ V $100+95\cos\left(\frac{\pi}{2}t+72.6^\circ\right)$ mA

Q3. $Zth = 0.211\cdot e^{-j90^\circ}\ \Omega$ $Vth = 4.211\cdot e^{j30^\circ}$ V

Q4. -6 V $\cos\left(10t+\frac{\pi}{2}\right)$ A

Q5. Don't need to know

Q6. 7V 5+2j Ω 5 Ω resistor + 1/8 F capacitor 1.22 – j0.49 VA

Q7. Don't need to know

Q8. $5.016\cos(10t+93.35^\circ)$ V

2015 Spring

Midterm

Q1. Absorbed 20W, 20W supplied 10W, 30W

Q2. -25/307 A

Q3. 60 Ω 0.15 W

Final

Q1. a = 2/3 0.225 W a = 4/3 0.9 W
Q2. -100/31
Q3. $0.51 + 0.29 \cdot e^{-4t}$ A
Q4. $Zth = 2 - j1.6\ \Omega$ $Vth = 4 \cdot e^{j55^\circ}$ V
Q5. $2.4 + 0.41\cos(50t - 74^\circ)$ A
Q6. 200 W

2015 Fall

Midterm

Q1. 20 V
Q2. 24 V 1.73 A
Q3. 12 Ω 3 W

Final

Q1. 17.1 V
Q2. Don't need to know
Q3. $12(1-e^{\frac{-t}{0.3}})$ $7/3-2/3e^{\frac{-t}{0.3}}$
Q4. $1.32\ \cos(25t - 12.6^\circ)$ A
Q5. $2.5 + 1.13\cos(5t + 64^\circ)$
Q6. 20-j20 1.95 W

2013 Winter

Final

Q1. $9 \cdot e^{-45^\circ}$
Q2. Don't need to know
Q3. Vth = 5.R2.Vs/(R1+5R2) Rth = R1.R2/(R1+5R2)
Q4. 1.5A 0V 0A 1.5V 1A 0V 0A 0V $1.5\ e^{\frac{-t}{4}}$ V
Q5. Don't need to know
Q6. $0.2 \cdot e^{j135^\circ}$ A $0.2\ \cos(1000t + 135^\circ)$ A
Q7. 2Ω 2H / 1 0Ω 2H /
Q8. $0.5 + 5\ \cos(1000t - 90^\circ)$ A
Q9. Don't need to know

Final Practice

Q1. Don't need to know
Q2. Don't need to know
Q3. -8 V -20 V -6 V
Q4. -0.5.(Vs + Is.R) -Vs 4RC -Vs + 0.5.(Vs – Is.R).exp(-t/4RC)
Q5. $7.5 \cdot e^{45^\circ}$ V 1 Ω
Q6. 9.5A $9.5\ \cos(5t)$ A No
Q7. (a) R 1/(L.w^2) (b) 2/(L.w^2) (c) no change
Q8. Don't need to know

2011 Winter

Quiz 1

Q1. iR = -Vs/R Vs/R – Is Vs.(Vs/R – Is) 1Ω

Midterm Practice

Q1. Vx = 2/7 (V1 – 2.V2 + V3)

Q2. -35 V -7/2 A 0 V 0 A

Q3. 0.5 A 2 W

Q4. -Vs/R R/2

Q5. 6/5 Ω 6/5 W

Q6. 3.Vs/R R/4