ECE 210 Exam #3 - 5 April 2013

#1 $i_2 R_2 + 40 \frac{di_2}{dt} + 16 e^{-400t} = 0$

$v_1(t) = 10 \frac{di_s(t)}{dt} + 5 \frac{di_2}{dt} = 32 e^{-400t} + 5 \frac{di_2}{dt}$

#2 $i_1(0^+) = 5.64\,A$

$i_1(\infty) = 10.5\,A$

$i_1(t) = 10.5 - 4.86 e^{-6000t}$

#3 $v_1(0^-) = -20V$ $\quad v_2(0^-) = 0V$

$v_1(0^+) = 0V$ $\quad v_2(0^+) = 0V$

$v_1(5\mu s) = -1.212V$ $\quad v_2(5\mu s) = 0V$

$v_1(15\mu s) = -2.92V$ $\quad v_2(15\mu s) = -32.92V$

ECE 209 Exam #3 - 25 November 2014

#1 $i_2(0^-) = 0\,A$

$i_2(0^+) = 0\,A$

$i_2 R_0 + 25 \frac{di_2}{dt} - 15 \frac{di_s}{dt} = 0$

#2 $i_1(0^-) = 0\,A$ $\quad i_1(0^+) = 0.467\,A$

$i_2(0^-) = 0.583\,A$ $\quad i_2(0^+) = 0.583\,A$

$i_3(0^-) = 0.117\,A$ $\quad i_3(0^+) = 0\,A$

$v_L(0^-) = 0V$ $\quad v_L(0^+) = 7V$

$v_3(0^-) = 7V$ $\quad v_3(0^+) = 0V$

#3 $v_c(t) = 5\left(1 - e^{-40(t-5\times10^{-3})}\right)$ V

$v_R(t) = 5e^{-40(t-5\times10^{-3})}$ V

#4 $\bar{V} = 4\angle 45°$ V

$\bar{I} = 25\angle -10°$ A

$v(t) = 6\cos(10{,}000\pi t + 40°)$ V

$i(t) = 21\cos(10{,}000\pi t + 65°)$ A

$6.414 + j1.414$ or $6.57\angle 12.43°$

$3.42 + j9.40$ or $10\angle 70°$

$12 - j32$ or $34.18\angle -69.44°$

ECE 209 Exam #3 – 3 April 2015

#2 $T = 0.526$ ms

$T = 30$ ms

#3 $i_c(0^-) = 0$ A $\quad i_c(0^+) = 6.75$ mA $\quad i_c(\infty) = 0$

$i_2(0^-) = 1$ mA $\quad i_2(0^+) = -0.688$ mA $\quad i_2(\infty) = 1$ mA

$v_c(0^-) = -120$ V $\quad v_c(0^+) = -120$ V $\quad v_c(\infty) = 150$ V

$v_2(0^-) = 150$ V $\quad v_2(0^+) = -103.1$ V $\quad v_2(\infty) = 150$ V

$v_c(t) = 150 - 270e^{-1000t}$ V

$i_c(t) = 6.75e^{-1000t}$ mA

#4 10 mJ, 40 mJ, 24 mW

ECE 209 Exam #4 - 22 April 2015

#1 2.5 V

2 ms

1.77 V

$2.5\cos(1000\pi t - 60^\circ)$ V

$\bar{V} = 15\angle 20^\circ$ mV

$\bar{I} = 25\angle -25^\circ$ A

$v(t) = 12\cos(50{,}000\pi t - 40^\circ)$ V

$i(t) = 2\cos(50{,}000\pi t + 65^\circ)$ A

$6.414 - j1.586$ or $6.607\angle -13.89^\circ$

$1.389 + j7.878$ or $8\angle 80^\circ$

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