Exam Topics for ECE 20002 - Electrical Engineering Fundamentals II

Shubham Saluja Kumar Agarwal

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These are exam topics for spring 2024 ECE 20002 at Purdue as taught by Professor Byunghoo Jung alongside recordings by Professor Michael Capano. Modify, use, and distribute as you please.
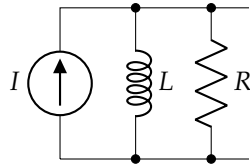
Contents

Exam 1

1. RC or RL circuit with input that can be either linear, SSS, or exponential. $\times$
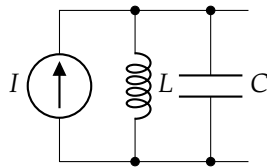   Example:

   With $I = 4e^{-3t}$, $L = 0.1H$, $R = 20\Omega$.

2. LC circuit with either linear or SSS input. $\times$
   Example:

   With $I = \cos(3t)$, $L = 0.1H$, $C = 0.02F$.

3. RLC circuit with linear input, only need to solve a part of the full thing, such as determining conditions for certain kinds of damping, or finding the equation from a midpoint solve. $\times$

4. Switched RL or RC circuit with around 3 time intervals or two switches. $\times$

5. Convolution with unit step function, like $[f(t)u(t)] * u(t)$.

6. Convolution with integration by parts once.

7. Unit step response/Impulse response. $\times$

8. Laplace Transform with time shift. $\times$

9. Inverse Laplace with real distinct solutions. $\times$

10. Inverse Laplace with either repeated, or complex conjugate. $\times$

Exam 2

1. 1 or 2 circuits with 2nd or 3rd order zero initial condition circuits.

2. Non-zero initial condition, 1st or 2nd order

3. Decomposition in 1st or 2nd order