The final exam will be closed book and notes. Bring a calculator. The MOSFET/JFET and the BJT notes will be provided. It will cover material presented in the lecture and lab, all homework, and all reading assignments in Jaeger and Alexander and Sadiku. There will be problems similar to the homework assignments for chapters 12, 13, and 14 of Alexander and Sadiku. The test is worth 140 points and is scheduled for three hours.

Review for exam 1

Review for exam 2

Balanced 3φ circuits - see notes for 5/20/02, 5/21/02
- rms units, positive sequence, \( E_y = \frac{E_A}{\sqrt{3}} \), \( Y - Y, Y - \Delta \)
- per phase analysis
- balanced 3φ instantaneous power: \( P(t) = 3 (V_{rms} I_{rms} \cos \theta) \)
- 2 wattmeter power measurement for 3φ power

Mutual (coupled) inductance - see notes for 5/24/02, 5/29/02
- coupled inductors: time- and frequency- domain equations, dot convention
- stored energy: \( W(t) = \frac{1}{2} L_1 (\dot{I}_1(t))^2 + \frac{1}{2} L_2 (\dot{I}_2(t))^2 + M (\dot{I}_1(t) \dot{I}_2(t)) \)
- coupling coefficient: \( k = \frac{M}{\sqrt{L_1 L_2}} \), \( 0 \leq k \leq 1 \)
- ideal transformer (\( k = 1 \), lossless): \( V_2 = n V_1 \), \( I_2 = \frac{1}{n} I_1 \), \( Y_2 = \frac{1}{n^2} Y_1 \) (reflected impedance)

Generalized frequency domain - see note for 6/3/02, 6/5/02
- \( s = \omega \) circuit analysis
- system function \( H(s) \) \(\rightarrow\) differential equation
- see notes on generalized frequency domain
- poles and zeros of \( H(s) \): poles roots of characteristic equation
- frequency response function \( H(\omega) = H(s)|_{s = j \omega} \)
- magnitude and phase plots: \( |H(\omega)| \) and \( \angle H(\omega) \)
- Bode plots for real poles and zeros of \( H(s) \)
- \( |H(\omega)| \) \(\text{db} = 20 \log_{10} |H(\omega)| \) and \( \angle H(\omega) \)
- log scale for \( \omega \), break frequencies for poles and zeros
- addition of straight lines: 20 dB/decade, 45°/decade