Midterm #2 Review

- Decibels
- Bode Plots
  - Magnitude Response
  - Phase Response
    - Superposition of LPF and HPF
- Op-Amps
  - Model
  - Summing Point Constraints
  - Different Configurations
    - Arithmetic operations
    - A-D conversion
    - Active Filters
- Semiconductor Devices
  - Silicon Atom, crystal structure

Midterm #2 Review Cont’d

- Semiconductor Devices
  - Dopants
  - Charge Concentration
  - Conductivity and resistivity
    - Scattering, drift velocity
    - Sheet resistance
- Diodes
  - Semiconductor Physics
    - Built-in Potential Barrier
    - Junction width
    - Junction Capacitance
    - I-V Characteristics
  - Zener Diodes
  - Load Line Analysis
  - Models (Ideal vs. Large signal)
Midterm #2 Review Cont’d

- Diode Applications
  - Rectifiers
  - Diode Logic
  - Photoelectric effect
    - Solar cells
    - Photodetectors
    - LEDs

- MOSFET
  - Semiconductor Structure
  - NFET and PFET
  - \( I_g \) vs. \( V_{gs} \)
  - \( I_d \) vs. \( V_{gs} \)

Midterm #2 Review Cont’d

- MOSFET
  - \( I_d \) vs. \( V_{gs} \)
    - Saturation vs. Triode
  - \( I_d \) vs. \( V_{ds} \)
    - Saturation vs. Triode
    - Channel Length Modulation
  - Load Line analysis
    - Finding the Q-point
  - Small Signal Model
    - Finding small signal parameters \( g_m, \) \( r_o \).
    - Finding the small signal gains and small signal impedances for the circuit