

EE40: Checklist for Midterm Exam 2
Nov 5 (2009) 9:30am-11am

Topics from HW1- HW 8 all included (Emphasis on HW4-8)
Charge, current, voltage, resistance , conductance, energy, power
Coulomb, ampere, volt, ohm, siemen, joule, watt
Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL)
Independent and dependent ideal voltage and current source
Resistor :Ohm's Law, Series connection, parallel connection
Resistor: Voltage divider, current divider
Nodal analysis (node, supernode)
Loop analysis (mesh, supermesh)
Superposition Principle
Equivalent circuits (Thevenin, Norton)
Power delivery, dissipation, storage, maximum power transfer
Operational amplifier (ideal op-amp model, full Op Amp model, use of feedback)
Various op-amp circuits with sources and resistors
Capacitor and Inductor: i-v relationship, power and energy
Capacitor and Inductor: Series connection, parallel connection ,op amp circuits
First-order transient analysis, time constant
Second-order transient analysis (particular solution, complementary solution)
Frequency, angular frequency, period, phase (Hz; radian/s); rms; dB scale, Bode Plots (magnitude and phase)
Phasors, Complex Impedance, Phasor Circuit Analysis, , Thevenin and Norton Equivalent's Transfer Function
AC Power, Max Power transfer (Section 5.7 of Hambley not included)
Passive and Active Filters
Series and Parallel Resonance, Resonant frequency, and Q Factor
Binary and Decimal numbers
Combinatorial Logic Circuits (AND, OR, NOT, XOR, NAND, NOR), Truth Table
Boolean Algebra, Sum-of-Products and Product-of-Sum Implementations
Minimization of Logic Circuits, Karnaugh Maps
Sequential Logic Circuits (flip flops, shift register, counters), timing diagram