Lists for Test 2 (4/13/04)

Terms:

Lift
Thrust
Rocket propulsion
Ultimate speed of rocket
Stages of a rocket
Thermal equlibrium
Conduction, thermal conductivity
Convection
Radiation
Light & electromagnetic radiation
Wavelength, frequency of wave
Black body spectrum, emissivity
Color temperature
Sublimation
Coefficient of volume expansion
Heat, work, internal energy (← T)
Entropy, disorder
Evaporation condensation cycle
Efficiency of heat engine
Internal combustion engine- 4-stroke
Gasoline vs. Diesel engines
Electrostatic forces
Elementary electric charge vs. coulomb
Ions, polarization
Photoconductor
Electric conductor vs. insulator
Pauli exclusion principle: one person/seat
Conduction band of semiconductor (balcony)
Valence band (ground floor)
Fermi level, band gap
Semiconductor vs. metal
Magnetic poles: N, S—dipole vs. monopole
Electromagnetic induction
Sources of E&M fields (Table 8.3.1)
Magnetic levitation, unstable equilibrium
Superconductors
Electric circuits: open, closed, short
Resistance, current
Direct vs. alternating current (DC vs. AC)
Transformer, primary, secondary
Electric generator: DC vs. AC
Doped semiconductors: n vs. p type
pn junction, depletion zone, dipole layer

New units and constants:

Absolute temperature (Kelvin): °C + 273
Boltzmann constant k_B
Gravitational constant G
Stefan-Boltzmann constant
Coulomb
Voltage
Coulomb constant
Ampere (amp)
Ohm

Laws: (cf. Important Laws & Equations)

Law of universal gravitation (5.3.1)
Stefan-Boltzmann law (6.2.1)
Laws of thermodynamics:
0) thermal equilibrium
1) conservation of energy: change of internal energy is heat into system minus work done by system
2) entropy of isolated object does not decrease
3) as T → 0, entropy → 0; can't get there in finite number of steps

Coulomb's law (8.1.1)
Lenz's law
Ohm's law (9.2.1)
Power = voltage change × current (9.1.2)
Transformer rules (p. 310)