Equations, relations, concepts

Chapter 2

Lorentz transformations
Time dilation
Length contraction
“interval” invariant
relativistic velocity transformation
relativistic momentum
relativistic energy
Thermodynamics, Chapter 19

Heat capacity
Specific heat
Heats of transformation
Work
P-V diagrams
Thermodynamic cycles
First law of thermodynamics

Thermodynamics, Chapter 20

Ideal gas law
…and kinetic energy of molecules
Maxwell speed distribution
Isothermal transformation
Equipartition theorem and degrees of freedom assignment
Molar specific heats, constant V, constant P
Adiabatic transformations
Thermodynamics, Chapter 21

Second law of thermodynamics
Engines
Carnot engine
Entropy relation
reversibility
Chapter 3
photon energy, Planck’s constant
Wien Displacement law
Planck’s blackbody formula
Photoelectric formula, Einstein

Chapter 4
Compton formula
Bohr Formula
Balmer Formula
Correspondence principle
Reduced mass relation
Chapter 5
Bragg’s law
De Broglie’s formula
Wave motion formulae, superposition
Single and double slit diffraction
Uncertainty relation
Copenhagen interpretation
Probability distributions, wavefunctions
Particle in a box

Chapter 6
Schrodinger equation
Time independent solutions to SE
Expectation value
Infinite square well
Finite square well
Simple harmonic oscillator solutions
Potential barriers
Chapter 7

Use of hydrogenic, single electron atom solutions to SE

Quantum numbers

Magnetic moment, Bohr magneton

Spin

Selection rules

Hydrogenic probability distributions
Chapter 12

Nuclear size
Nuclear nomenclature
Binding energy
“curve of binding energy”
independent particle model
liquid drop model
radioactive decay law
alpha, beta, gamma decays, electron capture
Q for decays
Carbon dating

Chapter 13

Q for reactions, exo- and endo-ergic
Nuclear resonances
Induced fission
Chain reactions
Proton-proton fusion chain


Chapter 14

Yukawa particle

Fermi’s model for beta decay