Step Physics Final Exam Review OUTLINE : May 2022

Part I - 40 Multiple Choice questions for 40 points covering chapters: 13,14,15,16,17,19,20,21, very little of chapter 27 (40 points)

Part II –6 Problems which must be worked out properly (60 points)

Chapters: 13 Oscillations and waves - Frequency, Amplitude, Wavelength, Period, Longitudinal waves, Transverse waves, Superposition and Interference, Constructive Interference, Destructive Interference

14 Sound – Beats, Doppler Effect

15 Light – Speed, Electromagnetic Spectrum

16 Reflection and mirrors – Angle of incidence, Angle of Reflection, Law of Reflection, Reflection from Plane Mirror, Reflection (Ray Tracing) for a Concave Mirror, Real and Virtual images

17 Refraction and lenses – Speed of light in various substances, Index of Refraction, Snell’s Law, Bending toward/away from the normal, Types of Lenses, Ray Tracing for a Convex Lens,

18 (Omit)

19 Electric Charges and Forces – Types of charge, Coulomb’s Law, Conductors, Insulators

20 Electric Fields and Electric Energy – Magnitude of Electric Field, Rules for drawing Electric Field lines, Change in Electric Potential (V = w/q)

21 Electric Current and Electric Circuits - Electric Current, Resistance, Ohm’s Law, Resistor, Diode, Series Circuit (and relationships), Parallel Circuit (and relationships), Power=VI, Energy = Pt=VIt

27 Special Relativity – Inertial reference frames, 2 postulates, Time dilation, Length contraction, Mass increase.

Some Videos which may help with part II:

Wave Speed: <http://www.youtube.com/watch?v=jAXx0018QCc>

Refraction: <http://www.youtube.com/watch?v=Gek2ttedf0Y>

Concave Mirror: <http://www.physicsclassroom.com/mmedia/optics/rdcmc.cfm>

Another concave mirror: <http://www.youtube.com/watch?v=7iK1nIJs49Y>

Convex Lens: <http://www.youtube.com/watch?v=c6mLLaqLdvg>

Coulomb’s Law: <http://www.youtube.com/watch?v=NERe7NLV6a8>

Series Circuit Calculations: <http://www.youtube.com/watch?v=zgONtlnph3c>