Study Guide for Exam 1 – Waves, light, and sound.

**Required Materials:**

Scantron (#882)

#2 pencil

Scientific calculator

**Optional Materials:** Any handwritten note sheets.

**Vocabulary**

Neutron proton electron ion isotope compound

Element molecule atom nucleus Atomic mass Atomic number

Mixture solid liquid gas plasma evaporation

Freezing Melting sublimation condensation electromagnetic waves

Wavelength frequency period wave speed transparent opaque

Shadow speed of light cyan magenta reflection incident ray

Angle of incidence law of reflection plane mirror convex

Concave virtual image real image upright inverted refraction

Index of refraction dispersion total internal reflection prism

Lenses focal length principal axis critical angle ionic bonding covalent bonding

Hydrogen bonding transverse longitudinal amplitude Mechanical waves

Infrasonic Ultrasonic Doppler effect Resonance

**Calculations**

1. Using index of refraction to calculate speed of light in a material.
2. Frequency
3. Period
4. Wave speed
5. Sound speed.

**Important Concepts**

1. Total internal reflection
2. Reflection law
3. Refraction law
4. Mixing light
5. Electromagnetic waves
6. Longitudinal and transverse waves
7. Wave Structure
8. Covalent and ionic bonding

**Skills**

1. Write numbers in scientific notation.
2. Use diagrams to predict the characteristics of an image that was formed by using a mirror or a lens.
3. Complete ray diagrams.
4. Measure wavelength and amplitude of a wave.
5. Classify waves into different categories.
6. Order electromagnetic radiations according to frequency or according to wavelength.
7. Distribute electrons in an atom.
8. Explain how Na and similar metals are bonded to other elements using ionic bonding.
9. Explain how carbon is bonded with hydrogen using covalent bonding.
10. Classify materials into elements, compounds, atoms, molecules, and mixtures.
11. Predict the color of an opaque and a transparent object.