

Sharyland ISD Study Guide

Physics Semester 1



Student Name: _____
Student ID: _____

Physics CBE A Review

Aligned with classroom textbook: Texas Physics- Serway • Faughn

Exam is a total of 40 multiple choice questions (2.5 points each)

What is Physics? (pg. 4-9)

- Areas within physics
 1. Mechanics
 2. Thermodynamics
 3. Vibrations and wave phenomena
 4. Optics
 5. Electromagnetism
 6. Relativity
 7. Quantum mechanics
- Models
- System
- Scientific method
- Controlled experiments

Measurements in Experiments (pg. 10-22)

- Accuracy
- Precision
- Significant figures
- SI Standards
 1. Meter
 2. Kilogram
 3. Second
- SI prefixes
- Convert measurements

The Language of Physics (pg. 23-27)

- Interpret data in tables and graphs
- Determine the meaning of a slope in a graph

Displacement and Velocity (pg.38-43)

- Frame of reference
- Displacement
 1. Positive displacement
 2. Negative displacement
- Average velocity

1. Definition
2. formula/Calculations (sample problems pg. 42)
3. Velocity Units
4. Graph velocity

Acceleration (pg. 46-56)

- Acceleration
 1. Definition
 2. formula/Calculations (sample problems pg.47)
 3. Acceleration unit
 4. Graph acceleration
 5. Signs of velocity and acceleration (pg. 49)
- Displacement with constant acceleration (sample problems pg. 51)
- Velocity with Constant Acceleration & Displacement with constant Acceleration (when given acceleration without final velocity): (Sample problems pg. 53)
- Final velocity after any displacement (sample problems pg. 55-56)

Falling Objects (pg. 58-62)

- Free fall
 - Undergo constant acceleration
 - Acceleration is constant during upward and downward motion
- Earth's gravity = -9.81 m/s^2
- formula/calculations (sample problems pg. 61-62)

Introduction to Vectors (pg. 82-85)

- Scalar
- Vector
- Resultant

- Adding, subtracting, multiplying, and dividing vectors & scalars (sample problems pg. 85)

Vector Operations (pg. 86-91)

- Coordinate systems in two dimensions
- Determine Resultant Magnitude & Direction using:
 - Pythagorean theorem and tangent functions for right triangles (sample problems pg. 88-89)

Projectile Motion (pg. 95-99)

- Projectiles are two-dimensional motion
- Recognize examples of projectile motion.
- A parabola is the path of a projectile.
- Vertical & horizontal motion of projectile
 - formulas/ calculations (sample problems pg.98-99)

Changes in Motion (pg.120-124)

- Force
 - Definition and unit
- Force Diagrams
 - Force is a vector
 - Free-body diagram: interpret and construct (sample questions: pg. 123-124)

Newton's 1st Law (pg. 125-129)

- Inertia
- Determine Net force (sample questions: 127-128)
- Equilibrium

Newton's 2nd & 3rd Law (pg. 130-134)

- Define both laws
- Newton's 2nd law formula/ calculations (sample questions pg. 131-132)
- Action/ Reaction pairs

Everyday Forces (pg. 135-139)

- Weight
- Normal force
- Static friction
- Kinetic friction
- Coefficient of friction: formulas/ calculations (sample questions: pg. 139)

Work

- Define & formula/ calculations (sample questions pg. 157-158)

Energy (pg. 160-168)

- Kinetic energy: define & formulate/calculate (sample questions pg. 161-162)
- Gravitational potential energy: Define & formulate (pg. 165)
- Elastic potential energy: define & formulate/calculate (sample questions: pg. 167-168)

Conservation of Energy (pg. 169-174)

- define
- Conservation of Mechanical Energy: Define & formulate/calculate (sample problem pg. 172-173)

Power (pg. 175-177)

- Define & formulate/ calculate (sample questions pg. 176- 177)

Circular Motion (pg. 226-231)

- Centripetal acceleration: define & formulate/ calculate (sample question pg. 227-228)
- Centripetal force: define & formulate/ calculate (sample questions pg. 229-230)
- Describing a Rotating System

Temperature and Thermal Equilibrium (pg.300-302)

- Temperature
- Internal energy
- Thermal equilibrium
- Matter expands as temperature increases

Defining Heat (pg. 307- 311)

- Explain heat as the energy transferred between substances
- Relate heat and temperature change on the macroscopic level

Thermodynamics (pg. 334-354)

- 1st & 2nd laws of thermodynamics
- Relationship between heat and work
- Entropy