

AP Physics Test: May 12th in the Afternoon

The test is split into 2 sections; Multiple Choice and Free Response.

There are 70 Multiple Choice questions for which you have 90 minutes to work. On this part of the exam you may use a pencil and you are provided with a constants sheet (not an equations sheet). You cannot use a calculator. The questions test the breadth of your knowledge and understanding of the basic principles of physics.

There are between 6 and 8 free response questions on the exam. You will be allowed to use a calculator and provided equation sheet. You also have 90 minutes for this exam. Your answers in the free-response section should demonstrate your knowledge of the principles that should be applied -- and how you should apply them -- to solve a variety of in-depth problems. Possible exam formats include, for example (but aren't limited to):

- Two questions of about 17 minutes and five questions of about 11 minutes each
- Four questions of about 17 minutes each and two questions of about 11 minutes each

The subjects covered on the test include;

Content Area	Physics B	Physics C
I. Newtonian Mechanics	35%	50%
A. Kinematics (including vectors, vector algebra, components of vectors, coordinate systems, displacement, velocity, and acceleration) <ol style="list-style-type: none"> 1. Motion in one dimension 2. Motion in two dimensions including projectile motion 	7%	9%
B. Newton's laws of motion <ol style="list-style-type: none"> 1. Static equilibrium (first law) 2. Dynamics of a single particle (second law) 3. Systems of two or more bodies (third law) 	9%	10%
C. Work, energy, power <ol style="list-style-type: none"> 1. Work and work-energy theorem 2. Forces and potential energy 3. Conservation of energy 4. Power 	5%	7%
D. Systems of particles, linear momentum <ol style="list-style-type: none"> 1. Center of mass ✓ 2. Impulse and momentum 3. Conservation of linear momentum, collisions 	4%	6%
E. Circular motion and rotation <ol style="list-style-type: none"> 1. Uniform circular motion 2. Torque and rotational statics 3. Rotational kinematics and dynamics ✓ 4. Angular momentum and its conservation ✓ 	4%	9%
F. Oscillations and gravitation <ol style="list-style-type: none"> 1. Simple harmonic motion (dynamics and energy relationships) 2. Mass on a spring 3. Pendulum and other oscillations 4. Newton's law of gravity 5. Orbits of planets and satellites 	6%	9%
II. Fluid Mechanics and Thermal Physics	15%	N/A
A. Fluid Mechanics <ol style="list-style-type: none"> 1. Hydrostatic pressure 2. Buoyancy 3. Fluid flow continuity 4. Bernoulli's equation 	6%	
B. Temperature and heat <ol style="list-style-type: none"> 1. Mechanical equivalent of heat 	2%	

2. Heat transfer and thermal expansion		
C. Kinetic theory and thermodynamics 1. Ideal gases 2. Laws of thermodynamics	7%	
III. Electricity and Magnetism	25%	50%
A. Electrostatics 1. Charge and Coulomb's law 2. Electric field and electric potential (including point charges) 3. Gauss's law ✓ 4. Fields and potentials of other charge distributions ✓	5%	15%
B. Conductors, capacitors, dielectrics 1. Electrostatics with conductors 2. Capacitors	4%	7%
C. Electric circuits 1. Current, resistance, power 2. Steady-state direct current circuits with batteries and resistors only 3. Capacitors in circuits	7%	10%
D. Magnetic Fields 1. Forces on moving charges in magnetic fields 2. Forces on current-carrying wires in magnetic fields 3. Fields of long current-carrying wires 4. Biot-Savart's law and Ampere's law ✓	4%	10%
E. Electromagnetism 1. Electromagnetic induction (including Faraday's law and Lenz's law) 2. Inductance (including LR and LC circuits) ✓ 3. Maxwell's equations ✓	5%	8%
IV. Waves and Optics	15%	N/A
A. Wave motion (including sound) 1. Traveling waves 2. Wave propagation 3. Standing waves	5%	
B. Physical optics 1. Interference and diffraction 2. Dispersion of light and the electromagnetic spectrum	5%	
C. Geometric optics 1. Reflection and refraction 2. Mirrors/Lenses	5%	
V. Atomic and Nuclear Physics	10%	N/A
A. Atomic physics and quantum effects 1. Photons, the photoelectric effect, Compton scattering, x-rays 2. Atomic energy levels 3. Wave-particle duality	7%	
B. Nuclear physics 1. Nuclear reactions (including conservation of mass number and charge) 2. Mass-energy equivalence	3%	

