

PES 1000 –Physics in Everyday Life – Essay Option Rubric

UNIT 1: (Chapters 2 – 6) Motion and Energy

Griffith 'The Physics of Everyday Life' 8th.ed.

Definitions

1. Some quantities in physics we describe as **vector quantities**. What two elements to all vector quantities have in common?
A. Name and number
B. Position and speed
C. Size (or magnitude) and direction
D. Size and shape

Mass, weight, force, position, velocity, acceleration, vector quantity, kinetic (sliding) friction, static friction, work, energy, conservation of energy, apparent weight, astronomical unit, period, frequency

Statement of Newton's 3 Laws of motion; Statement of Kepler's 3 Laws of orbits; Energy and work definitions; centripetal and centrifugal force;

Units

2. The International Standard (SI), or metric system, units for mass are:
A. Kilograms (kg)
B. Newtons (N)
C. Pounds (lb)
3. The acceleration due to gravity in the metric system is:
A. 4.5 m/s every second
B. 32 m/s every second
C. 9.8 m/s every second

SI units: length, time, mass, energy, force and weight, ~~power~~, ~~gravitational acceleration~~, work, period, frequency
US Customary units: length, time, ~~power~~, force and weight

Relationships

4. You travel at a constant velocity for one hour, so you have moved a certain distance. If your velocity had been greater, your distance would have been:
A. Greater
B. Less
5. Gravitational potential energy depends on all but which of the following quantities?
A. Gravitational acceleration
B. Mass
C. Speed change
D. Height change

Force and acceleration, weight, velocity, position, kinetic energy, potential energy for gravity and springs, conservation of energy, energy loss to kinetic friction, static friction and normal force, coefficient of friction

Applications

6. In an elevator which is moving at constant speed upward, what would a scale read if you stood on it?
A. Less than your normal weight
B. Your normal weight
C. More than your normal weight

Projectiles and their trajectories

Ball on a string

Weight on the moon and on a space station

Elevators

Roller coasters and airplanes

Box on a spring, pendulum

The following list of equations will be provided on the back page of the traditional multiple-choice exam.

Equation List: $\Sigma F=ma$, $W=mg$, $v=v_0+a*t$, $x=x_0+v_0*t+1/2*a*t^2$, $K=1/2*mv^2$, $P_{Gravity}=mgh$, $P_{Spring}=1/2*k*s^2$, $F_{friction}=\mu*F_{Normal}$, $work=F*d$, $a_{centripetal}=v^2/r$, $F_{gravity}=G*M_E*m/R^2$, $(Period)_{years}^2=(Avg. dist. To sun)_{AU}^3$, $Period_{pendulum}=2\pi*sqrt(L/g)$

(ΣF =sum of forces, m=mass, a=acceleration, W=weight, x=position, v=speed, t=time, K=kinetic energy, P=potential energy, k=spring constant, s=stretch from natural length, F=force, μ =friction coefficient, d=distance, r=radius of path, G=Universal gravitational constant, M_E =mass of Earth, R=distance between centers), L=length