

- Instructions:
- Do all of your work on this sheet.
  - Show all of your steps in problems for full credit.
  - Be clear and neat in your work. Any illegible work, or scribbling in the margins, will not be graded.
  - Place your answers in a box.
  - If you need more space, you may use the back of the page and write **On back of page#** in the problem space.

1. **Multiple Guess** Find the answer which best fits the question and write it in the space provided.
- a) Decreasing the mass at the end of a simple pendulum will  
 a) increase the frequency b) decrease the period c) increase the period d) have no effect on either the period or frequency. d
- b) Two objects are separated by a distance R. If one of the objects is replaced by another having twice as much mass and the separation distance is doubled, then the gravitational force is  
 a) twice as much; b) half as much; c) four times as much; d) a quarter as much; e) the same. b
- c) Which of the following is false?  
 a) An object can have zero velocity while accelerating.  
 b) An object can have constant velocity and have a varying speed.  
 c) An object can reverse direction when the object's acceleration is constant. b
- d) A process in which the volume remains constant is called  
 a) isothermal; b) isobaric; c) adiabatic;  
 d) quasistatic; e) isochoric. e
- e) The speed of a pendulum is greatest  
 a) before it reaches the bottom of its swing b) when its acceleration is greatest c) when the potential energy is least d) when its kinetic energy is least e) none of these c
- f) As an ambulance drives away from an observer, the siren frequency will  
 a) stay the same.  
 b) increase.  
 c) decrease. c
- g) In an inelastic collision what is conserved?  
 a) Energy b) mass c) velocity d) momentum d
- h) The amount of work required to stop a horizontally moving object is equal to the  
 a) velocity of the object; b) mass times acceleration of the object; c) the weight of the object; d) the kinetic energy of the object; e) none of these. d
- i) Starting from rest at the same height, which of the following objects will reach the bottom of an incline first?  
 a) a hoop with mass 2M and radius R b) a sphere with mass M and radius R c) a cylinder with mass M and radius 2R b

	Page	Score
1	20 pts	
2	60 pts	
3	60 pts	
4	60 pts	
Total 200 pts		
j)	When one stretches liquorice, the stress is given by a) the change in length per original length; b) the applied force per unit area; c) the restoring force; d) none of these. <u>b</u>	
k)	In longitudinal wave motion a) the direction of particle displacement is parallel to the direction of wave motion b) the vibrating particles move in circles c) the energy carried by each particle is not transmitted to adjacent particles d) the direction of particle displacement is perpendicular to the direction of wave motion <u>a</u>	
l)	In the absence of a net force, an object will always a) be at rest, b) be in motion with a constant non-zero velocity, c) be accelerated, d) none of the above. <u>d</u>	
m)	The first harmonic in a stretched string of length L has a wavelength of a) L/2 b) L c) 2L d) 3L e) 4L <u>c</u>	
n)	Doubling the intensity of a sound increases the intensity level a) 3 dB b) 5 dB c) 10 dB d) 20 dB <u>a</u>	
o)	The tangential speed at a point on the hubcap of a uniformly rotating car wheel is a) greater than at a point on the tire b) the same as at a point on the tire c) greater than the translational velocity when there is no slipping d) none of these. <u>d</u>	
p)	If an object placed in an incompressible fluid displaces an amount of liquid of greater weight than its own, the object will a) float b) sink c) "float" at some totally submerged equilibrium position d) none of these. <u>a</u>	
q)	The superposition of waves that produces a composite wave of greater amplitude than any of the individual waves is a) constructive interference b) destructive interference c) reflection d) harmonic motion <u>a</u>	
r)	The entropy of a system in a reversible adiabatic process a) increases b) decreases c) remains constant d) is always less than the entropy change for an irreversible process between the initial and final states <u>c</u>	
s)	When the pressure of an ideal gas remains constant, an increase in the volume causes the temperature to a) increase b) decrease c) remain the same. <u>a</u>	
t)	Spontaneous heat flow from a colder body to a warmer body is in violation of the a) first law b) second law c) third law d) zeroth law <u>b</u>	