HW 1

Note: $g = 10$ m/s^2

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

a d c a

1. If x and t represent position and time, respectively, the dimension of A in
$$x(t) = At + Bt^2 \text{ must be .}$$

a) L/T^2 **b) L/T**   c) LT^2 d) LT

2. A force of 1N is equal to

a) 1 kg.m/s^2   b) 1 kg.m/s   c) 1 kg/s   d) 1 kg.m^2/s

3. A car travels 40 Km at an average speed of 80 km/h and then travels 40 Km at an average speed of 40 km/h. The average speed of the car for this 80-km trip is:

a) 50 km/h   b) 68.8 km/h   c) 48.7 km/h   **d) 53.3 km/h**

4. An object moves along the x-coordinate according to the equation x(t)=(3-4 t^2) m. The average velocity between t = 1 and t = 2 s is

a) 8 m/s   b) 12 m/s   **c) -12 m/s**   d) 16 m/s

5. A woman pushes a toy car initially at rest by exerting a constant horizontal force of magnitude 5 N, the car moves 1 m. If the mass of the car is 0.2 kg. What is its final speed?

a) 5 m/s   b) 5.8 m/s   c) 4.5 m/s   **d) 7.1 m/s**

6. An automobile moving along a straight track changes its velocity from 40 m/s to 80 m/s in a distance of 200 m. What is the (constant) acceleration of the vehicle during this time?

a) 24 m/s^2 b) 18 m/s^2 **c) 12 m/s^2**   d) 6 m/s^2

7. A ball is thrown directly downward with an initial velocity of 5 m/s from a height of

$w=x$ $t=?$

?30 m, when does the ball strike the ground

a) 5 s   b) 4 s   c) 2
                           S   d) 3 s

$\rightarrow a=-9$ $x_1=0$ v_i

A ball is thrown vertically upward from the ground with an initial speed of 3 m/s. 8.
?How long (in s) does it take the ball to reach its maximum height $v_f=0$
t

0.7   (b) 0.9   (c) (a)
                       0.3   (d) 0.5

v_i $v_A=0$

A particle is traveling at a speed of 4 m/s and comes to rest after undergoing a 9.
constant negative acceleration for 40 m. How long (in s) does it take the particle to
$-a$ Δx $t=?$?come to rest

20   (b) 8   (c) 5   (a)
                                                                       (d) 10

m v_i
                                                    v_f
A car of mass 1000 kg moving initially at a speed of 20 m/s is brought to stop in a 10.
distance 50 m. The stopping force (in N) is
Δx f
a) 2000   b) 1000   c) 3000   d)
                                                                                4000

m Δx
A 10 kg block is released from rest 10 m above the ground. When it has reached the 11.
:ground its kinetic energy (in J) is

a) 1000   b) 4000   c) 1200   d)
                                                                                2200

$v_1=0$ Δx
A 6.0-kg block is released from rest 80m above the ground. When it has fallen 60m 12.
its kinetic energy is

4000 J   (b) 3600 J   (c) 1200 J   (d) 120 J (a)

In the figure below, the coefficient of kinetic friction between the 6-kg object and the 13.
surface is 0.2. The force F (in N) necessary to pull both blocks to the right with an
acceleration of 3 m/s^2 is

40   (b) 36   (c) (a)
                      24   (d) 12

kg 2

F