Physics 200 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chapter 2: Extended Kinematics Problems Practice

1. A car accelerates from rest at a constant rate of -4m/s2. After accelerating at this rate for a distance of 500m, the car turns off its engine and begins to coast. The car coasts for 22 seconds with constant deceleration before finally coming to rest. *Sketch a helpful diagram and then answer the questions below.*

a. What was the car’s maximum speed during this event?

b. What was the car’s velocity when it reached its maximum speed?

c. At what time did the car reach that velocity?

d. What was the car’s acceleration during its coasting period?

e. How far did the car travel after its motor turned off?

f. What was the car’s total displacement?

a. 63.2m/s b. -63.2m/s c. 15.8s d. 2.87m/s2 e. 695m f. -1195m

2. A plastic action figure is launched vertically upward from a point 10m above the ground [At t0 = 0s, the height of the action figure is 10m above the ground]. From t=0s to t=6s, the action figure travels solely under the influence of gravity. Air resistance can be ignored for this time period. At t=6s, the action figure’s height is 40m. Between t=6s and t=7s, a parachute pops out of the figure and deploys, causing the figure’s speed to decrease at a constant rate for that 6s to 7s time period. At t=7s, the figure’s speed is 3m/s. From t=7seconds onward, the action figure floats the rest of the way to the Earth (height = 0m) at a constant speed of 3m/s. *Sketch a helpful diagram and then answer the questions below – Some o you may have to change you diagram after part b.*

a. What was the action figure’s initial velocity?

b. What was the action figure’s velocity at t=6s?

c. What was the figure’s average acceleration between t=6s and t=7s?

d. What was the figure’s displacement between t=6s and t=7s?

e. What was the figure’s elevation at t=7s?

f. How long did the entire trip last?

g. What was the figure’s average speed for the entire trip?

a. 34.3m/s b. -24.5m/s c. 21.5m/s2 d. -13.8m e. 26.3m f. 15.75s g. 8.25m/s