

## Physics 31A Quiz #2 (60pts)

1. (10) A 100-kg bale of dried hay falls off a truck traveling on a level road at 88.0km/h. It lands flat on the blacktop and skids 100m before coming to rest. Assuming a uniform deceleration, compute the coefficient of kinetic friction.
2. (10) The kid pulls a loaded wagon having a total mass of 100kg. He applies a constant force of 100N along the handle at  $30.0^\circ$ . Ignoring friction, compute the horizontal force on the wagon and the resulting acceleration.
3. (10) A young kid with a huge baseball cap is playing catch with himself by throwing a ball straight up. How fast does he throw if the ball comes back to his hands a second later?
4. (10) A baseball recoiling from a bat soars into the air at an angle of  $40.0^\circ$  above the ground traveling at 45.7m/sec. Assuming it is caught at the same height at which it is hit. Calculate the ball's theoretical range.
5. (2.5) A body moving with an acceleration having a constant magnitude must experience a change in (a) velocity (b) speed (c) acceleration (d) weight (e) none of these
6. (2.5) If  $[L]$  represents the dimension of length and  $[T]$  that of time, then the dimensions of acceleration are (a)  $[L + T^2]$  (b)  $[L/T]$  (c)  $[L^2/T]$  (d)  $[L/T^2]$  (e) none of these
7. (2.5) The average speed of a coconut during a 2-s fall from a tree, starting at rest, is (a) 19.6 m/s (b) 9.8 m/s<sup>2</sup> (c) 39.2 m/s (d) 9.8 m/s (e) none of these.
8. (2.5) If the displacement of a body is a quadratic function of time, the body is moving with (a) a uniform acceleration (b) a nonconstant acceleration (c) a uniform speed (d) a uniform velocity (e) none of these
9. (2.5) If  $L$  stands for length,  $T$  for time, and  $M$  for mass, the dimension of force are (a)  $[ML^2]$  (b)  $[ML/T]$  (c)  $[ML/T^2]$  (d)  $[LT/M]$  (e) none of above
10. (2.5) If (with no friction) a force  $F$  result in an acceleration  $a$  when acting on on a mass  $m$ , then tripling the mass and increasing the force sixfold will result in an acceleration of (a)  $a$  (b)  $a/2$  (c)  $2a$  (d)  $a/6$  (e) none of these
11. (2.5) Is it possible to devise a technique to push on a table without it pushing back on you? (a) Yes, out in space. (b) Yes, if someone else also pushes on it. (c) A table never pushes in the first place. (d) No. (e) None of these.
12. (2.5) Two forces, each of 100 N acting at a point such that they are  $120^\circ$  apart, are equivalent to a single force of (a) 100N (b) zero (c) 200N (d) 86.6N (e) none of these.