

Instructor(s): *N. Sullivan*PHYSICS DEPARTMENT
Midterm Exam 1

September 19, 2011

Name (print, last first): _____ Signature: _____

*On my honor, I have neither given nor received unauthorized aid on this examination.***YOUR TEST NUMBER IS THE 5-DIGIT NUMBER AT THE TOP OF EACH PAGE.**

- (1) **Code your test number on your answer sheet (use lines 76–80 on the answer sheet for the 5-digit number).** Code your name on your answer sheet. **DARKEN CIRCLES COMPLETELY.** Code your UFID number on your answer sheet.
- (2) Print your name on this sheet and sign it also.
- (3) Do all scratch work anywhere on this exam that you like. **Circle your answers on the test form.** At the end of the test, this exam printout is to be turned in. No credit will be given without both answer sheet and printout.
- (4) **Blacken the circle of your intended answer completely, using a #2 pencil or blue or black ink.** Do not make any stray marks or some answers may be counted as incorrect.
- (5) **The answers are rounded off. Choose the closest to exact. There is no penalty for guessing. If you believe that no listed answer is correct, leave the form blank.**
- (6) Hand in the answer sheet separately.

$$g = 9.80 \text{ m/s}^2$$

1. (4 points) A ball is thrown up vertically at 20 m/s. How high will the ball go?
 (1) 20.4 m (2) 2.04 m (3) 5.10 m (4) 40.8 m (5) 7.10 m
2. (4 points) Jane sets out on a walk. She walks 8 km east and then 15 km north. How far is she from her starting point?
 (1) 17 km (2) 23 km (3) 16 km (4) 7 km (5) 30 km
3. (4 points) A stone is dropped from a bridge. It hits the water 2 seconds after it is dropped. What is the height of the bridge above the water?
 (1) 19.6 m (2) 39.2 m (3) 27.6 m (4) 4.9 m (5) 9.8 m
4. (4 points) A block of mass 10 kg sits on an inclined plane. The coefficient of static friction between the block and the surface is 0.60. At what angle (in degrees) must the block be raised before it begins to slide?
 (1) 31° (2) 75° (3) 42° (4) 25° (5) 62°
5. (5 points) An automobile is initially backing up at a speed of 5 m/s. At time $t = 0$ the automobile begins accelerating in the forward direction at 4 m/s². What is its net displacement after 4 s of acceleration?
 (1) 12 m (2) 0 m (3) 6 m (4) 3 m (5) 9 m
6. (5 points) A police cruiser is traveling at 20 m/s. A car traveling in the same direction at 30 m/s passes the cruiser. At this moment the car begins to accelerate in the forward direction at a rate of 2 m/s², and the cruiser begins to accelerate in the forward direction at 4 m/s². How far does the cruiser travel until it catches up to the car?
 (1) 400 m (2) 500 m (3) 200 m (4) 100 m (5) 200 m
7. (4 points) An astronaut wants to measure the acceleration of gravity on planet X. On Earth his powerful dart gun will shoot a dart a maximum horizontal distance of 30 m before the dart returns to the same height from which it was shot. He performs the same experiment on planet X, and finds that the dart gun shoots the dart a maximum distance of 60 m. What is the value of the acceleration due to gravity on Planet X?
 (1) 4.9 m/s² (2) 7.6 m/s² (3) 9.8 m/s² (4) 14.8 m/s² (5) 2.5 m/s²