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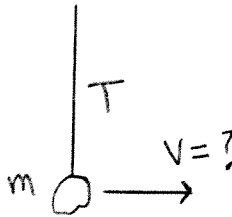
Lab Section Number _____

Exam 2 Chapt. 6-8 in Young&Geller

Multiple Choice questions. Circle the correct answer. No work needs to be shown.

(6 pts) 1. A small rock with mass $m = 0.20$ kg swings back and forth on the end of a 2.0 m long string. As the rock passes through its lowest point, with the string vertical, the tension in the string is $T = 3.92$ N. At this point the speed of the rock is

- (a) 4.43 m/s
- (b) 6.26 m/s
- (c) 7.67 m/s
- (d) 8.85 m/s
- (e) 10.8 m/s
- (f) none of the above values



(5 pts) 2. A block slides up an incline from point A at the bottom to point B at the top of the incline. During the motion from point A to point B , the work done by the gravity force on the rock is

- (a) zero
- (b) positive
- (c) negative

(5 pts) 3. In question 2, the work done by the normal force on the rock is

- (a) zero
- (b) positive
- (c) negative

(5 pts) 4. At point A an object has speed 8 m/s . At point B it has speed 12 m/s . During the motion from A to B the total work done on the object is

- (a) zero
- (b) positive
- (c) negative

(5 pts) 5. On a horizontal frictionless surface a 5 kg block moving at 8 m/s collides with a 55 kg block that is initially at rest. Which of the following statements is correct:

- (a) the magnitude of the change in momentum for the 5 kg block is less than the magnitude of the change in momentum for the 55 kg block.
- (b) the magnitude of the change in momentum for the 5 kg block is the same as the magnitude of the change in momentum for the 55 kg block.
- (c) the magnitude of the change in momentum for the 5 kg block is greater than the magnitude of the change in momentum for the 55 kg block.

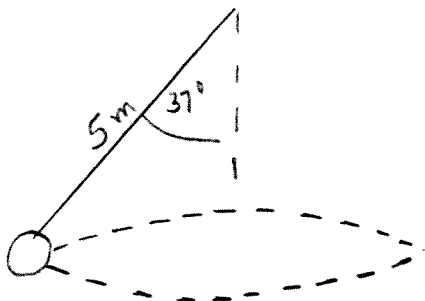
(6 pts) 6. A 98 kg block is at rest on a horizontal frictionless surface and is attached to one end of a horizontal spring. The other end of the spring is attached to the wall. A 2 kg block traveling horizontally at 10 m/s strikes the 98 kg block and sticks to it. After the collision the maximum elastic potential energy stored in the spring is

- (a) 5000 J
- (b) 0.20 J
- (c) 2.0 J
- (d) 49 J
- (e) 100 J
- (f) none of the above answers



On the following problems show all your work. Partial credit will be given if earned. Write your answers in the blanks provided.

(18 pts) 7. A small rock attached to one end of a 5.0 m long string swings in a horizontal circle at constant speed. The angle between the string and the vertical direction is 37° and is constant. The tension in the string is $T = 40 \text{ N}$.



(a) What is the mass of the rock?

Ans. _____

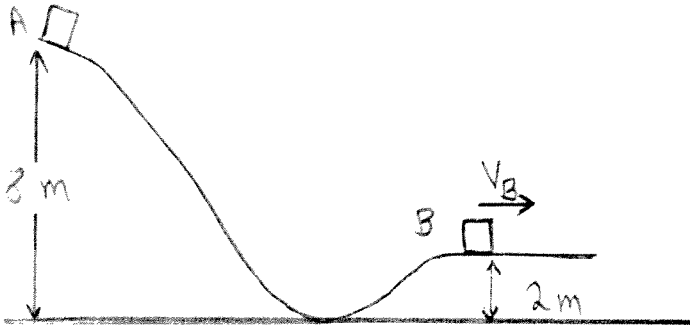
(b) How much time does it take the rock to complete one complete revolution?

Ans. _____

(18 pts) 8. On Planet X you throw an object straight up with a speed of 8 m/s and find that it reaches a maximum height of 48 m above the point from which it was thrown. The mass of Planet X is 6.0×10^{24} kg. What is the radius of Planet X?

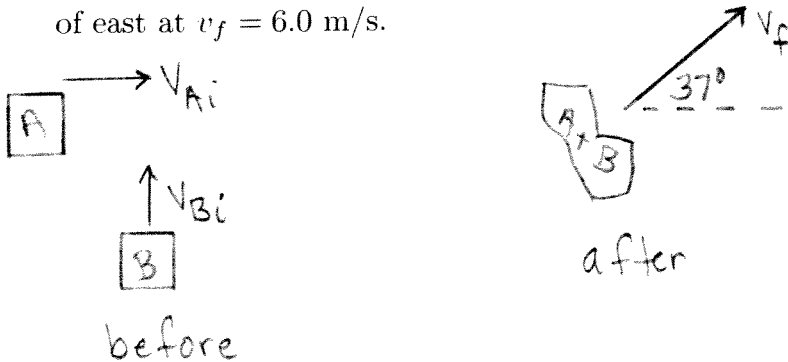
Ans. _____

(16 pts) 9. A block with mass 2.0 kg is released from rest at point A on a metal track and slides to point B , as shown on the sketch. At point B the block has speed $v_B = 5.0\text{ m/s}$. Point A is 8.0 m above the ground and point B is 2.0 m above the ground. How much work is done on the block by friction as the block moves from point A to point B ? (You must indicate whether your answer is positive or negative.)



Ans. _____

(16 pts) 10. On a horizontal frictionless surface block A (mass 2.0 kg) is sliding toward the east with speed v_{Ai} and block B (mass 4.0 kg) is sliding north at speed v_{Bi} . The blocks collide and stick together. After the collision the combined object is moving at 37° north of east at $v_f = 6.0\text{ m/s}$.



(a) What is was the initial speed v_{Ai} of block A ?

Ans. _____

(b) What is was the initial speed v_{Bi} of block B ?

Ans. _____