

Course No: *Eng1302*
Course Title: *Physics I*
Date: *20/09/2014*
No. of Questions: *(7)*
Time: *2:00 hours*
Using Calculator: *(Yes)*

University of Palestine



final Exam
2013/2014
Total Grade:80

Instructor Name: *Dr. Loai Afana*
Student No.: _____
Student Name: _____
College Name: _____
Dep. / Specialist: _____
Using Dictionary: *(No)*

Question 1:

(10)

Which of the following equations are dimensionally correct?
Where: (x, y, m) is unit of length, (v) is velocity, (a) is acceleration,

(a) $v_f = v_i + ax$

(b) $y = (2m) \cos(kx)$, where $k = 2m^{-1}$

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Question 2:

(10)

Find the angle between the two vectors :

$$\vec{A} = 2i - j + 2k,$$

$$\vec{B} = 3i - 4j$$

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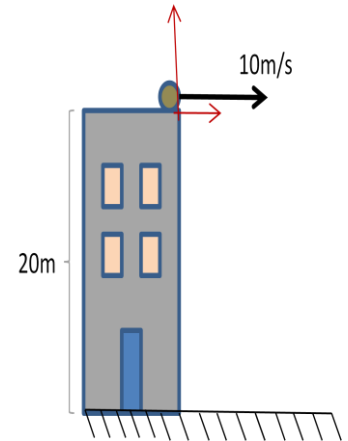
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Question 3:

(12)

An object is thrown horizontally with an initial velocity 10 m/s from the top of a 20m high building.

- 1- How long does it take to reach the ground?
- 2- Where dose the object strike the ground.
- 3- Prove that Trajectory of a projectile is a parabola.



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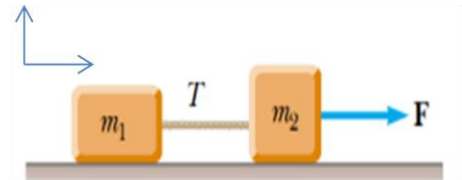
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Question 4:

(12)

Two blocks connected by a mass-less rope, and pulled by a horizontal force F ,
Suppose that: $F = 68.0 \text{ N}$, $m_1 = 12.0 \text{ kg}$, $m_2 = 18.0 \text{ kg}$,
and the coefficient of kinetic friction between each block and the surface is $\mu_k = 0.100$.

- (a) Draw a free-body diagram for each block (m_1, m_2).
- (b) Determine the magnitude of the acceleration.
- (c) Determine the tension of the system.



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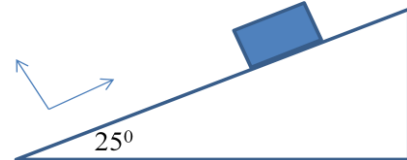
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Question 5:

(12)

- A 0.23 kg block slides down an incline of 25° at a constant velocity. The block slides 1.5 m.
- Draw a free-body diagram.
 - Find the magnitude of the forces acting on the block.
 - What is the total work done on the block?



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Question 6:

(12)

- A child of mass m slides on a track of height $h = 2.00$ m. The child starts from rest at the top.
- (A) Determine his speed at the bottom, assuming no friction is present.
- (B) Assume that $v_f = 3.00$ m/s and $m = 20.0$ kg, if a force of kinetic friction acts on the child, how much mechanical energy does the system lose?



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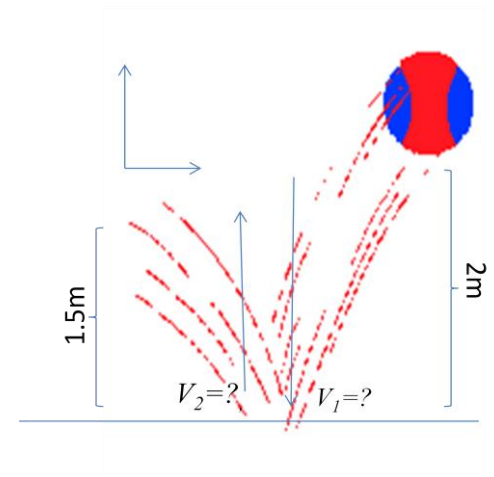
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Question 7:

(12)

A 100 g ball is dropped from 2.00 m above the ground. It rebounds to a height of 1.50 m.

- 1- Find the speed (V_1) and (V_2) just before the ball hits and after it leaves the ground
- 2- Find the average force exerted by the floor if the ball was in contact with the floor for 1×10^{-2} s.



End of Question