FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS
IMAM UNIVERSITY

101Phys. Mid1 exam
1st semester
2014

NAME:
ID:
Section:

خاص بالأستاذة		
الدرجة المكتسبة	الدرجة المستحقة	السؤال
	12	**الأول**
	6	**الثاني**
	2	**الثالث**
	20	**المجموع**

دعواتنا لكن بالتوفيق

Constant:

$$g = 9.8 \, m/s^2$$

Q1: Choose the correct answer and write the litter on it in the following table: (one point each)

1	2(a)	2(b)	3	4	5	6	7	8	9	10	11

1-The components of vector$\vec{A}$ are given as follows:

$$A_x = 5.6 \quad , \quad A_y = -4.7$$

What is the angle between vector $\vec{A}$ and positive direction of x – axis?

a. 320°   b. 180°   c. 90°   d. 127°   e. 230°

2-The components of vectors $\vec{A}$ and $\vec{B}$ are given as follows:

$$A_x = 5.1 \quad , B_x = -2.6$$
$$A_y = -5 \quad , B_y = -4.3$$

(a)What is the unit vector notation of $\vec{A} + \vec{B}$

a. $2.5\hat{\imath} - 9.3\hat{\jmath}$ b. $0.1\,\hat{\imath} - 6.9\hat{\jmath}$ c. $-2.5\hat{\imath} + 9.3\hat{\jmath}$ d. $7.7\hat{\imath} - 0.7\hat{\jmath}$

e. $-7.7\hat{\imath} + 0.7\hat{\jmath}$

(b)What is the magnitude of vector sum $\vec{A} + \vec{B}$

a. 5.1   b. 2.5   c. -9.3   d. 9.6   e. -3.8

3-Two vectors are given as follows:

$$\vec{A} = -3\hat{\imath} + 6\hat{\jmath} - 5\hat{k}$$
$$\vec{B} = -2\hat{\imath} + 3\hat{\jmath} + \hat{k}$$

The vector dot product $\vec{A} \cdot \vec{B}$ equals:

a. -12   b. 10   c. 14   d. 19   e. 20

4- The subtracting of vector $\vec{A}$ with its negative vector is:

a. $\vec{A}$

b. $2\vec{A}$

c. $-\vec{A}$

d. zero

5. Action-reaction forces
 a. sometimes act on the same object.
 b. always act on the same object.
 c. may be at right angles.
 d. always act on different objects

6. Suppose that an object is moving with a constant velocity. Make a
   statement concerning its acceleration.

a. The acceleration must be constantly increasing.
b. The acceleration must be constantly decreasing.
c. The acceleration must be a constant non-zero value.
d. The acceleration must be equal to zero.

7. A stone is thrown from the top of a building with an initial velocity of 20
m/s downward in 2 s. What is the building high?
   a. 20.4 m   b. 60 m   c. 35 m   d. 16 m   e. 10 m

8.A 500-kilogram sports car accelerates uniformly from rest, reaching a
speed of 30 m/s in 6 seconds. During the 6 seconds, the car has traveled a
distance of:
   a. 15 m   b. 30 m   c. 60 m   d. 90 m   e. 180 m

9. The unit vectors $\hat{i}$ and $\hat{j}$
a. can have a dot product equal to 1.
b. can have a dot product equal to 0.
c. can have a dot product k.
d. can have a negative dot product.
e. cannot be coplanar.

10. The unit of force is:

a. $kg \, m^2/s$

b. $kg \, m/s$

c. $kg \, m/s^2$

d. $kg \, m^2/s^2$

e. $kg \, m^2/s^3$

11. A net force F accelerates a mass m with an acceleration a. If the same net force is applied to mass 2m, then the acceleration will be
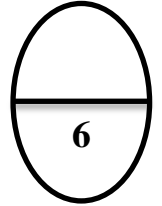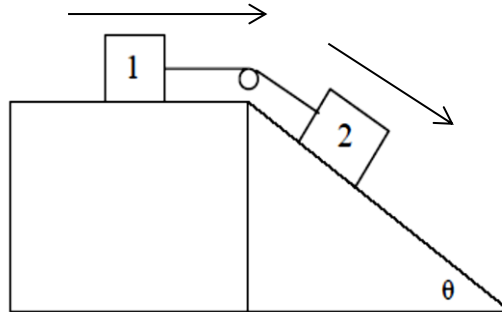a. 4a.   b. 2a.   c. a/2.   d. a/4.

Q.2   Two blocks, both of mass 0.5 kg, are connected to each other by a thin string which is passed over a pulley as shown in the diagram. Block 1 sits on a rough horizontal part. Block 2 sits on a frictionless incline which forms an angle $\theta=30°$ with the horizontal. The system moves cause the incline surface:

a) Sketch a free body diagram for block 1(using the following drawing)? (1 point)
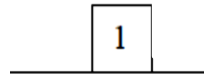
b) What is the normal force on block 1? (1.5 points)

c) Calculate the kinetic of force friction for the block 1($\mu_k = 0.4$)? (1.5points)

d) Calculate the acceleration of the system if the tension of the string is 2.2N? (2points)

Q.3 A car travel from x_i=30m at t=0 to x_f=50m at t=5s, what is the average velocity? (2points)