بسم الله الرحمن الرحيم

Kingdom of Saudi Arabia	المملكة العربية السعودية
Ministry of higher Education	وزارة التعليم العالي
Al-Imam Mohammed Bin Saud Islamic University	جامعة الإمام محمد بن سعود الإسلامية
College: Science	Course Name: General Physics
Department: Physics	Course Code:101
	Semester/Year: final exam / 1435-1436
	Duration: 2 houre

التعليمات:

1- أجب عن جميع الأسئلة
2- إجابتان على نفس السؤال تلغي الدّرجة.
3- تكتب الإجابة بقلم الحبر في ورقة الأسئلة.
4- مسموح: الآلة الحاسبة.
5- اكتب اسمك ورقمك الجامعي في المساحة المخصصة لذلك
6- عند حاجتك لمساحة إضافية في الحل، فبإمكانك استخدام ظهر الصفحات لإكمال الحل.

اسم الطالب	الرقم الجامعي	الشعبة

خاص بالأستاذ							
السؤال	الأول	الثاني	الثالث	الرابع	الخامس	السادس	السابع
الدرجة	10	4	6	4	4	6	6
الدرجة المكتسبة							

المجموع		توقيع المدقق	

$g = 9.8 m/s^2$ $K = 9\times10^9 N.m^2/C^2$

Question 1 (10 Points):

Please choose one correct answer and put it in the table below

1	2	3	4	5	6	7	8	9	10

1- If stone fell from the top of a building (from the rest) and reached the ground after 2.5 s. What was the height of the building?

A. 11.875 m

B. 30.625 m

C. 33.125 m

D. 122.50 m

2- A ball is thrown straight upward from ground level with an initial velocity of 20m/s. At the highest point it reaches:

A. The acceleration is zero

B. The velocity is 20 m/s

C. The velocity is zero

D. The acceleration is at minimum

3- At t=0, a particle moving in xy plane with constant acceleration has velocity of υ=(3i-2j)m/s. At t=3.0s, the particle's velocity is υ =(9i+7j)m/s. The acceleration of the particle is:

A. (2i+3j) m/s^2

B. (2i+1.66j) m/s^2

C. (4i+3j) m/s^2

D. (4i+1.66j) m/s^2

4- A 6 kg block initially at rest is pulled to East along a horizontal, frictionless surface by a constant horizontal force of 12 N. What is the speed of the block after it has moved 3*m*?

A. 3.46 m/s

C. 4.80 m/s

B. 2.76 m/s

D. 1.98 m/s

5- A car is moving at 40m/s. The x component of its velocity is 30m/s. What is the y component of the velocity?

A. 10.0 m/s

C. 26.5 m/s

B. 18.7 m/s

D. 70.0 m/s

6- Consider an 80 kg man and 320 kg horse both running along a road with the same kinetic energy. The man must run:

A. With the same speed as the horse.

C. 4 times as fast as the horse.

B. Twice as fast as the horse.

D. 16 times as fast as the horse.

7- An object weighing 15 Newton is lifted from the ground to a height of 0.22 meter. The increase in the object's gravitational potential energy is approximately:

A. 668.2 J

C. 3.3 J

B. B. 32.3 J

D. 68.2 J

8- Two vectors A and B. If A.B= 5 where A= (3i+ 2j) m **and the angle between them is 300^{o}. So, the magnitude |B| is.**

A. 0.36 m

C. 3.6 m

B. 0.77 m

D. 2.78 m

9- The magnitude of the electric field E at a distance r from an isolated point charge q is:

A. kq/r

C. kq/r^3

B. kr/q

D. kq/r^2

10- A Skater starts from the rest on a frictionless surface. After 1 second the velocity became 3m/s; assuming that the total power was 9.8 Watt. So, the mass of the crate is:

A. 2.17 Kg

B. 6.53 Kg

C. 3.27 Kg

D. 19.6Kg

Question 2 (4 Points):

The driver of a car slams on the brakes when he sees a tree blocking the road. The car slows down uniformly with a constant acceleration of (-5.6 m/s^2) for (4.20 seconds), making straight skid marks (62.4 m) long, all the way to the tree. With what speed does the car then strike (hit) the tree?

Question 3 (6 Points):

A 0.21*kg* pine cone falls 14 *m* to the ground, with initial speed of 13 *m/s*.

Note: Use conservative or non-conservative energy

A. With what speed would the pine cone have landed if there had been no air resistance?

B. Find the speed at the half distance of the path (7 m)

C. Find the acceleration of the pine.

Question 4 (4 Points):

Vector $\vec{A}$ has x and y components of -8 cm and 15cm, respectively (A_x= -8cm, A_y=15cm); vector $\vec{B}$ has x and y components of 13 cm and -9 cm, respectively (B_x=13.2cm, B_y= - 9 cm). If $\vec{A}-\vec{B}-3\vec{C}=\vec{0}$.

A. What are the components of $\vec{C}$? (C_x =? and C_y =?)

B. Calculate the direction (θ) of vector $\vec{C}$.

Question 5 (4 Points):

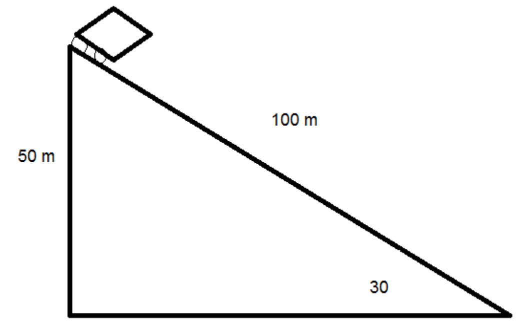
A car of mass 1100 Kg on a friction surface ($\mu_k = 0.2$) can accelerate from the rest to a speed 30 m/s in 1 minute calculate:

A. The friction force.

B. The force required by the car's engine.

Question 6 (6 Points):

A car of mass 1300Kg slides 100m down an icy slope, the slope being inclined 30° to the horizontal. If the frictional force and air resistance are ignored



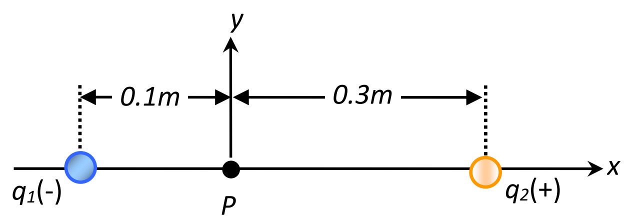
A. Show the free body diagram.

B. Calculate the acceleration of the car.

C. Calculate the total work.

Question 7 (6 points):

Three point charges, q_1= -3μC and q_2= 5μC are arranged as shown in figure.



A. Find the total electric field that the charges q_1 and q_2, at point P.

B. Find the total electric force on $\boldsymbol{q_3}$ (q_3= 6μC) exerted by $\boldsymbol{q_1}$ and $\boldsymbol{q_2}$.