

اسئلة فيزياء

الاسئلة فيزياء

معدل =  $\frac{20}{25}$

Mu'tah University - Department of Physics

Medical Physics (100)  
First Exam

Sunday 9/11/2014

$g = 9.8 \text{ m/s}^2$

$\hat{i} = \hat{x}$   
 $\hat{j} = \hat{y}$

الاسم: ...  
الرقم الجامعي: ...  
اسم المدرس: ...

1	2	3	4	5	6	7	8	9	10
C	B	C	B	B	B	E	E	B	C

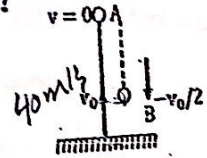
Q1. Consider the following equation:  $x = At^4 + (B/A)t^2$ , where  $x$  is the distance,  $t$  is the time and  $v$  is the speed. The dimensions of  $B$  is  
 A)  $L^2 T^{-4}$  B)  $L^2 T^{-5}$  C)  $L^2 T^{-6}$  D)  $L^2 T^{-8}$  E)  $L^2 T^{-7}$

Q2. The x component of vector  $\vec{A}$  is  $3.0 \text{ m}$  and the Y component is  $-4.0 \text{ m}$ . The magnitude of  $\vec{A}$  and the angle that it makes with the positive x-axis is:  
 A)  $10 \text{ m}; 127^\circ$  B)  $5.0 \text{ m}; 53.1^\circ$  C)  $5.0 \text{ m}; 127^\circ$  D)  $5.0 \text{ m}; 307^\circ$  E)  $5.0 \text{ m}; 233^\circ$

Q3. A vector  $\vec{A}$  is added to the sum of two vectors  $\vec{B} = 3\hat{i} - 2\hat{j} - 2\hat{k}$  and  $\vec{C} = 2\hat{i} - \hat{j} + 3\hat{k}$  such that  $\vec{A} + \vec{B} + \vec{C} = -2\hat{i}$ . The vector  $\vec{A}$  is:  
 A)  $-5\hat{i} + 3\hat{j}$  B)  $-5\hat{i} + 5\hat{j} - \hat{k}$  C)  $-7\hat{i} + 3\hat{j} - \hat{k}$  D)  $-4\hat{i} + 4\hat{j} - \hat{k}$  E)  $-3\hat{i} + 3\hat{j} - 2\hat{k}$

Q4. A ball is thrown vertically upward with an initial velocity  $v_0$  and reaches its maximum height in  $4\text{ s}$ . At what time, after it was thrown, will it have velocity  $-v_0/2$ ?  
 A)  $9\text{ s}$  B)  $6\text{ s}$  C)  $15\text{ s}$  D)  $18\text{ s}$  E)  $12\text{ s}$

after 6 s  
الوقت، تلكه



Q5. The velocity of a truck moving in a straight line is given by  $v(t) = 2 - 4t + 4t^2$  where  $v$  is in  $\text{m/s}$  and  $t$  is in seconds. Find the velocity (in  $\text{m/s}$ ) of the truck at the instant when its acceleration is  $20 \text{ m/s}^2$ .  
 A)  $10$  B)  $26$  C)  $0$  D)  $4.5$  E)  $16$

في 26  
تسارعت  
و هو  $4.5 \text{ m/s}$

مكتبة ال ٩٥  
للخدمات الطلابية  
جامعة مؤتة - البوابة الجنوبية  
٠٢٢٢٧٥١١١ - ٠٤٠٤٨٨٩٦٩٧

مكتبة ال ٩٥ للخدمات الطلابية  
جامعة مؤتة - قرطاس  
البوابة الجنوبية / مؤتة  
٢٢٧٥١١١ - ٠٤٠٤٨٨٩٦٩٧

$4.5R \text{ m/s} = \frac{1}{2} g y + \frac{1}{2} v^2$

$1.199 (4.5R - 2R)$

2.5 x 2

20

Jordan University  
Physics 101

Mul'ah University / Department of Physics  
First exam in physics 101  
Tuesday, 11/11/2014

الرقم المتكامل: 1E  
الشيء:

1	2	3	4	5	6	7	8	9	10
B	A	A	A	B	A	A	A	B	B

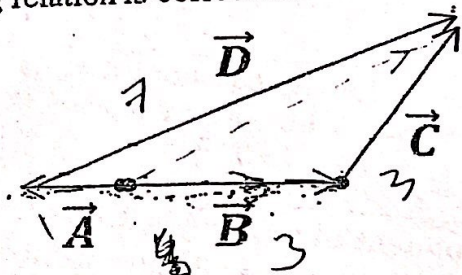
use  $g = 10 \text{ m/s}^2$

1. The velocity of a particle is given by the equation  $v(t) = At + Bt^2 + Ct^3$ . If this equation is dimensionally correct, where  $v$  is the velocity,  $t$  is the time,  $B$  and  $C$  are constants. The SI unit of the constant  $B$  is?

- A.  $1/\text{s}^2$     B.  $\text{m/s}^3$     C.  $\text{m/s}^2$     D.  $\text{m}^2/\text{s}^3$     E.  $\text{m} / \text{s}^4$

2. For the vectors in the figure, which one of the following relation is correct is:

- A.  $\vec{B} - \vec{D} = \vec{A} + \vec{C}$     B.  $\vec{C} + \vec{B} - (\vec{A} + \vec{D}) = 0$   
 C.  $\vec{B} - \vec{A} = \vec{D} + \vec{C}$     D.  $\vec{A} + \vec{B} + \vec{C} = -\vec{D}$   
 E.  $\vec{B} + \vec{C} = \vec{A} - \vec{D}$



3. If  $\vec{A} = -6\hat{i} + 3\hat{j}$ , the magnitude of the vector  $\vec{B}$  so that  $\vec{B} = -\frac{1}{3}\vec{A}$  is:-

- A.  $\sqrt{13}$     B.  $\sqrt{2}$     C.  $\sqrt{5}$     D.  $\sqrt{8}$     E.  $\sqrt{18}$

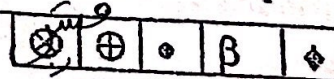
4. If the magnitude of  $\vec{A}$  and  $\vec{B}$  are 4 units and 3 units respectively and the resultant is 3 units. The angle between the vectors  $\vec{A}$  and  $\vec{B}$  in degrees is:

- A. 90    B. 120    C. 68  
 D. 48    E. 29

The head of vector  $\vec{B}$  on the tail of vector  $\vec{A}$

An object moves from point A to point B with a speed of 5m/s and comeback from B to A with speed of 3m/s. The average speed of the object is :-

- A. 4.44 m/s    B. 5.45m/s    C. 2.40m/s    D. 5.33m/s    E. 3.75m/s



1 ✓	2 ✓	3 ✓	4 ✓	5 ✓	6 ✗	7 ✓	8 ✓	9 ✗	10 ✓	18 25
b	b	b	a	b	c	a	b	b	c	

\* Acceleration due to gravity =  $g = 9.8 \text{ m/s}^2$

Q1: The equation for the change of position of a train starting at  $x = 0 \text{ m}$  is given by  $x = \frac{1}{2}at^2 + bt^3$

The dimensions of  $b$  are:

- a)  $LT^{-3}$       b)  $T^{-3}$       c)  $LT^2$       d)  $LT^{-1}$

Q2: A car moving in a straight road with constant acceleration of  $8 \text{ m/s}^2$  covers a distance between two points A and B, 100 m apart, in 10 seconds. Find the final velocity (in  $\text{m/s}$ ) at point B.

- a) 25      b) 50      c) 110      d) 35

Q3: Of the following situations, which one is impossible?

- a) A body having velocity east and acceleration east. ✓  
 b) A body having velocity east and acceleration west. ✗  
 c) A body having variable velocity and constant acceleration. ✓ maybe  
 d) A body having constant velocity and variable acceleration. ✗ impossible

Q4: An object moves along the x-coordinate according to the equation  $x = (4t^2 - 3) \text{ m}$ . Determine average velocity between  $t = 1 \text{ s}$  and  $t = 2 \text{ s}$ .

- a) 12 m/s      b) 16 m/s      c) 10 m/s      d) 18 m/s

Q5: A ball thrown vertically from ground level is caught 4 s later by a person on balcony 14 m above the ground. The initial speed (in  $\text{m/s}$ ) of the ball is:

- a) 30.2      b) 23.1      c) 10.2      d) 19.4

Q6: What is the angle between the vectors  $\vec{A} = 3\hat{i} - \hat{j}$  and  $\vec{B} = 2\hat{i} - 5\hat{j}$ ?

- a)  $29.3^\circ$       b)  $49.8^\circ$       c)  $60^\circ$       d)  $40^\circ$

Q7: A vector  $\vec{A}$  has positive x component 4 units in length and positive y component length. What is the magnitude of the second vector  $\vec{B}$  when added to  $\vec{A}$  gives vector with no x component and negative y component 4 units in length?

- a) 7.2      b) 3.6      c) 6.7      d) 9

Q8: A projectile is fired in such a way that its initial velocity is  $56 \text{ m/s}$  and strikes a horizontal distance of 320 m away. The projection angle (in degrees) is:

- a) 90      b) 30      c) 60      d) 45

الاسم بالعربية: مروان الموسوي  
رقم الجلوس: 12.5  
التاريخ: 7/4/2010

وقت المحاضرة: 12.5 ← اثنتين دار جفاء

Q1:- The equation for the change of position of a train starting at  $x=0$  m is given by  $x = \frac{1}{2}at^2 + bt^3$ . The dimensions of  $a$  are

- a.  $T^{-3}$       b.  $LT^{-3}$        c.  $LT^{-2}$       d.  $LT^{-1}$

Q2:- The coordinate of a particle in meters is given by  $x(t) = 32t - 6t^3$ , where the time  $t$  is in seconds. The particle is momentarily at rest at  $t =$

- a. 0.77 s      b. 1.77 s       c. 1.3 s      d. 7.3 s

Q3:- airplane is in level flight at an altitude of 0.6 km and a speed of 150 km/h. At what distance should it release a heavy bomb to hit the target on the earth?

- a. 461m      b. 454m      c. 420m       d. 2550m

Q4:- An object is moving on a circle path of radius  $\pi/2$  meters at a constant speed of 4m/s. the time required for one revolution is:

- ~~a.  $2\pi^2$~~       ~~b.  $\pi^2/2$~~       ~~c.  $\pi^2/4$~~        d.  $\pi/2$

Q5:- A projectile is thrown from the top of a building with an initial velocity of 40 m/s in the horizontal direction. If the top of the building is 40 m above the ground, how fast will the projectile be moving just before it strikes the ground?

- a. 35 m/s      b. 39 m/s       c. 48 m/s      d. 41 m/s

Q6: If  $\vec{A} = 3\hat{i} - 4\hat{j}$ ,  $\vec{B} = 2\hat{i} + 3\hat{j}$ , and  $\vec{C} = \hat{i} + 2\hat{j}$  what is the angle that the vector  $-\vec{A} - \vec{B} + \vec{C}$  makes with the positive  $x$ -axis?

- a.  $143^\circ$       b.  $37^\circ$       c.  $217^\circ$       d.  $233^\circ$

For this part answer Q7 and Q8

A projectile is launched straight up at 60.0 m/s from a height of 80.0 m at the edge of a sheer cliff. The projectile falls, just missing the cliff and hitting the ground below.

Q7: The maximum height of the projectile above the point of firing is

- (a) 184m      (b) 222m      (c) 440m      (d) 203m

Q8: The time it takes to hit the ground at the base of the cliff is

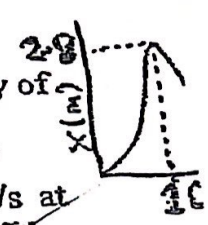
- (a) 18.5s      (b) 22.5s       (c) 13.5s      (d) 20.3s

General Physics 101  
Spring 2005/2006  
Name: عبدالله محمد عبدالمجيد

Mu'tah University  
Dept. of Physics  
Section: (1-A)

First Exam  
55 minutes.  
Number: 24

1. Given  $A = 4i - 2j$  and  $B = -i + 7j$ . The magnitude of  $A + B$  is,  
(a) 7.44 (b) 4.74 (c) 5.83 (d) 4.47
2. In the previous (المسألة السابقة) problem the angle that  $A + B$  makes with the y-axis is,  
(a)  $27^\circ$  (b)  $31^\circ$  (c)  $63^\circ$  (d)  $59^\circ$
3. The figure shows  $x(t)$  graph (المنحنى) for certain particle, the velocity of the particle at  $t$  in m/s is,  
(a) zero (b) 0.28 (c) 3.5 (d) 7
4. A stone is thrown from the top of a hill with initial velocity of 20 m/s at an angle of  $37^\circ$ . If it reaches the ground after 2 s. The height (ارتفاع) of the hill is,  
(a) -80 m (b) 8.1 m (c) 4.5 m (d) 4.5 m
5. For the previous problem, the magnitude of the stone velocity just before it hits the ground is,  
(a) 63.2 m/s (b) 23.6 m/s (c) 66.9 m/s (d) 17.7 m/s
6. A particle moves along the x-axis according to the equation (حسب المعادلة)  $x = -(2t^3 + 3t^2 - 5t)$  m, the acceleration of the particle at  $t = 2$  s is,  
(a)  $-30 \text{ m/s}^2$  (b)  $18 \text{ m/s}^2$  (c)  $30 \text{ m/s}^2$  (d)  $-81 \text{ m/s}^2$
7. The volume (حجم) of a sphere (كرة) as a function of time is given by  $V = bt^2$ . The dimension of b is,  
(a) L/T (b)  $L^3/T^2$  (c)  $T^2/L^3$  (d) T/L
8. A bullet (رصاصة) was fired from a horizontal rifle (مسدس) with initial velocity of 500 m/s on a 300 m away target, (خلف) the bullet strikes the target at y equals,,  
(a) 0.78 m (b) -0.78 m (c) -1.76 m (d) 1.76 m
9. A jumper leaves the ground at an angle of  $20^\circ$  to the horizontal with a speed of 15 m/s. The time needed for the jumper to reach the maximum height is,  
(a) 3.8 s (b) 8.3 s (c) 0.5 s (d) 0.38 s
10. For the jumper in previous problem, the maximum range (المدى) is,  
(a) 2.9 m (b) 9.74 m (c) 7.94 m (d) 14 m



1	2	3	4	5	6	7	8	9	10
C	A	B	D	B	A	B	C	C	D

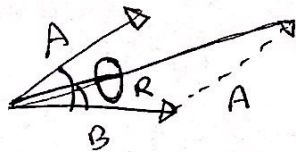
1	2	3	4	5	6	7	8	9	10
C	<del>C</del>	C	D	A	B	A	D	C	A

1. Vector D has a magnitude of 3m and makes an angle of  $-45^\circ$  with the x-axis, its x-component equals,  
 (a)  $-2.1$  m (b)  $-1.2$  m (c)  $+2.1$  m (d)  $+1.2$  m  $\rightarrow A \cdot B = 1$
2. The angle between the two vectors  $A=2i+3j+k$  and  $B=-4i+2j-k$  is,  
 (a) 50 (b) 100 (c) 120 (d) 60  $\rightarrow A \cdot B = 1$
3. The velocity of a car at any time is given by the equation,  $v=(60+0.5t^2)$  m/s, the average acceleration of the car between  $t=1$ s and  $t=3$ s is,  
 (a)  $4$  m/s<sup>2</sup> (b)  $3$  m/s<sup>2</sup> (c)  $2$  m/s<sup>2</sup> (d)  $1$  m/s<sup>2</sup>
4. Using the equation of previous problem, the instantaneous acceleration at  $t=1$ s equals,  
 (a)  $4$  m/s<sup>2</sup> (b)  $3$  m/s<sup>2</sup> (c)  $2$  m/s<sup>2</sup> (d)  $1$  m/s<sup>2</sup>
5. A ball is dropped from a tall building from rest, the position of the ball after 2 s is,  
 (a) 10 m (b) -10 m (c) 20 m (d) -20 m
6. Given  $A=6i+3j-k$  and  $B=4i-5j+8k$ , the magnitude of  $2A - B$  equals,  
 (a) 17 (b) 18 (c) 19 (d) 20
7. A car moving with  $x=(2-0.25t^2)$ m and  $y=(t+0.025t^3)$ m, the distance of the car from the origin at  $t=2$  s is,  
 (a) 2.1 m (b) 2.2 m (c) 2.3 m (d) 2.4 m
8. A goat jumped off the edge of a cliff with a horizontal velocity equals 9 m/s, the (x,y) components of its position at  $t=0.5$  second is,  
 (a) (1.2, -4.5)m (b) (-1.2, 4.5)m (c) (4.5, -1.2)m (d) (-4.5, 1.2)m
9. A player hits a ball with initial velocity of 37 m/s with an angle  $53.1^\circ$ , the maximum height that the ball can reach is,  
 (a) 34.8 m (b) 84.3 m (c) 43.8 m (d) 48.3 m
10. A long jumper leaves the ground at an angle of  $20^\circ$  above the horizontal at a speed of 11 m/s, his maximum range is,  
 (a) 9.74 m (b) 7.94 m (c) 4.97 m (d) 9.47 m

$$R^2 = 28.94 \quad R = \sqrt{A^2 + B^2 + 2AB \cos \theta} \quad \vec{R} = -2i + 5j$$

$$|\vec{R}| = \sqrt{29}$$

$$|\vec{R}| = 5.38$$



$$R^2 = A^2 + B^2 + 2AB \cos \theta$$

$$28.94 = 13.98 + 20.97 + 34.25 \cos \theta$$

$$-6.01 = 34.25 \cos \theta$$

$$\cos \theta = -0.175$$

$$\theta = 100^\circ$$

$$|\vec{A}| = \sqrt{4+9+1} = \sqrt{14} = 3.74$$

$$|\vec{B}| = \sqrt{16+4+1} = \sqrt{21}$$

الإسم: سليمان محمد أمين  
 مد الرقم الجامعي: ١٢٠١٤٠٤١٢٠٦٥

Note:  $g = 10 \text{ m/s}^2$

1	2	3	4	5	6	7	8	9	10
B	D	A	A	C	A	A	C	B	d

1. The position of a particle moving along the x-axis is described by the relation:  $x(t) = 2 - t^3$ . The average acceleration (in  $\text{m/s}^2$ ) of that particle in the time interval  $t = 0\text{s}$  to  $t = 1\text{s}$  is.

- (a) -9      (b) 6      (c) -3      (d) -1

2. If  $\vec{A} = 3\hat{i} - 4\hat{j}$ ,  $\vec{B} = 2\hat{i} + 3\hat{j}$ , and  $\vec{C} = \hat{i} + 2\hat{j}$ , the magnitude of  $-\vec{A} + \vec{B} + \vec{C}$  is

- (a) 6.1      (b) 5      (c) 1      (d) 9

3. What is the value of [10 Kg] ?

- (a) 10      (b) L      (c) 10L      (d) M

4. An object moves along the x axis according to the equation  $x(t) = (-t^2 - 3t + 2)\text{m}$ . The speed at 3 s ?

- (a) 9      (b) 6      (c) 5      (d) -5

5. A ball is thrown directly downward, with an initial speed of  $4\text{m/s}$ , from a height of  $h$  and takes  $2\text{s}$  to reach the ground, what is the height of  $h$  ?

- (a) 20      (b) 13      (c) 15      (d) 69

6. A points in the xy plane have Cartesian coordinates  $(5, 20)\text{ m}$ . Determine its angle in polar coordinates.

- (a)  $76^\circ$       (b)  $50^\circ$       (c)  $33^\circ$       (d)  $33^\circ$

7. A particle initially located at the origin has an acceleration of  $\vec{a} = 3.0\hat{j} \text{ m/s}^2$  and an initial velocity of  $\vec{v}_i = 8.0\hat{i} \text{ m/s}$ . The vector position (in m) of the particle at  $t = 2.0\text{ s}$  is

- (a)  $16\hat{i} + 6\hat{j}$       (b)  $4\hat{i} + 6\hat{j}$       (c)  $4\hat{i} + 3\hat{j}$       (d)  $3\hat{i} + 5\hat{j}$

8. A long-jumper leaves the ground at an angle of  $40^\circ$  above the horizontal and at a speed of  $11.0\text{ m/s}$ . How far does he jump in the horizontal direction?

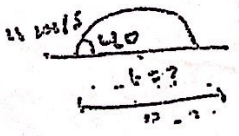
- (a) 4      (b) 8      (c) 5.2      (d) 12

9. If  $\vec{A} = 6\hat{i} - 3\hat{j}$  then  $2\vec{A}$  has a magnitude of

- (a) 7      (b) 15      (c) 19      (d) 22

10. The direction of displacement depends on

- (a) velocity      (b) distance      (c) force      (d) final and initial position



$$v_y = v_i - gt$$

$$0 = 11 \sin 40 - (10)t$$

$$\therefore t = 0.7$$

$$R = v_0 \cdot t_2$$

$$R = 11 \cos(40) (0.7)^2$$

= 4

Note:  $g = 10 \text{ m/s}^2$ .

1	2	3	4	5	6	7	8	9	10
b	<del>a</del>	d	e	a	b	a	a	<del>c</del>	<del>b</del>

- The position of a particle moving along the x-axis is described by the relation:  $x(t) = 2 - t^3$ . The average acceleration (in  $\text{m/s}^2$ ) of that particle in the time interval  $t = 0\text{s}$  to  $t = 2\text{s}$  is  
 (a) -9 (b) -6 (c) -3 (d) -1
- If  $\vec{A} = 3\hat{i} - 4\hat{j}$ ,  $\vec{B} = 2\hat{i} + 3\hat{j}$ , and  $\vec{C} = \hat{i} + 2\hat{j}$ , the magnitude of  $\vec{A} + \vec{B} + \vec{C}$  is  
 (a) 6 (b) 5 (c) 9 (d) 1
- What is the value of [10 dyes] ?  
 (a) 10 (b) L (c) 10L (d) T
- An object moves along the x axis according to the equation  $x(t) = (-t^2 - 3t + 2)\text{m}$ . The speed at 2 s ?  
 (a) 5 (b) 6 (c) 7 (d) -9
- A ball is thrown directly downward, with an initial speed of 8m/s, from a height of h and takes 2s to reach the ground, what is the height of h ?  
 (a) 36 (b) 13 (c) 15 (d) 69
- A points in the xy plane have Cartesian coordinates (10, 12.) m . Determine its angle in polar coordinates.  
 (a)  $76^\circ$  (b)  $50^\circ$  (c)  $63^\circ$  (d)  $33^\circ$
- A particle initially located at the origin has an acceleration of  $\vec{a} = 3.0\hat{j} \text{ m/s}^2$  and an initial velocity of  $\vec{v}_i = 4.0\hat{i} \text{ m/s}$ . The vector position (in m) of the particle at  $t = 2.0 \text{ s}$  is  
 (a)  $8\hat{i} + 6\hat{j}$  (b)  $4\hat{i} + 6\hat{j}$  (c)  $4\hat{i} + 3\hat{j}$  (d)  $3\hat{i} + 5\hat{j}$
- A long-jumper leaves the ground at an angle of  $60^\circ$  above the horizontal and at a speed of 11.0 m/s. How far does he jump in the horizontal direction?  
 (a) 4 (b) 10 (c) 5.2 (d) 6
- If  $\vec{A} = 3\hat{i} - 9\hat{j}$  then  $2\vec{A}$  has a magnitude of  
 (a) 7 (b) 15 (c) 19 (d) 22
- The direction of average velocity depends on  
 (a) speed (b) displacement (c) force (d) distance

مكتبة الـ ٩٥  
 للخدمات الطلابية  
 جامعة مؤتة - البوابة الجنوبية  
 ٠٧٩٦٩٨٦٥٠٤ - ٠٣٣٣٧٥٦٦٩



ادبيات

سنة اول

امتحان فيزياء

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Jordan University of Science & Technology  
Physics 101 First Exam Thursday 7/3/2013 Dept. of Physics Spring 2013

الاسم: احمد عبد الكريم محمد الفاضل الرقم الجامعي: 20120025147

الشعبة: ..... - المدوس: ..... الرقم المتكامل: 45

Q#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans	B	D	A	B	D	0	D	B	<	B A	<	A	A B	D	A

Consider  $g = 10 \text{ m/s}^2$

Q1) Vector  $A$  has a magnitude of 5 m points east and vector  $B$  has a magnitude of 3 m points west. What is the resultant vector  $A + B$ ?  
A) 1.0 m east      B) 2.0 m east      C) 1.0 m west      D) 2.0 m west

Q2) A force of 1N is?  
A) 1 kg/s      B) 1 kg · m/s      C) 1 kg · m<sup>2</sup>/s      D) 1 kg · m/s<sup>2</sup>

Q3) A particle starts from the origin at  $t = 0$  with a velocity of  $v_i = (12i - 12j) \text{ m/s}$  and moves in the  $xy$ -plane with a constant acceleration of  $a = (3i - 6j) \text{ m/s}^2$ . What is its speed at  $t = 2.0 \text{ s}$ ?  
A) 30 m/s      B) 28 m/s      C) 24 m/s      D) 33 m/s

Q4) Vectors  $A = -i + 2k$  and  $B = 2i + 3k$  are in the  $xz$ -plane are given by the equations. Find  $A \times B$ ?  
A)  $-7j$       B)  $7j$       C)  $6j$       D)  $-6j$

Q5) A particle moves along the  $x$  axis from  $x_i$  to  $x_f$ . Which of the following positions produce the largest displacement?  
A)  $x_i = 4 \text{ m}, x_f = 6 \text{ m}$       B)  $x_i = -4 \text{ m}, x_f = -8 \text{ m}$   
C)  $x_i = 4 \text{ m}, x_f = -2 \text{ m}$       D)  $x_i = -4 \text{ m}, x_f = 4 \text{ m}$

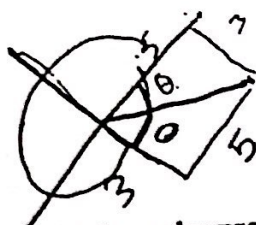
Q6) A projectile is fired from ground level with an initial velocity  $v_i = 28i + 20j$ . What is the horizontal range of the projectile?  
A) 132 m      B) 120m      C) 112 m      D) 104 m

Q7) The position of an object is given by  $x(t) = 4t^2 - t^3$ , where  $x$  is in meters and  $t$  is in seconds. Its average acceleration over the interval from  $t = 0$  to  $t = 3 \text{ s}$  is?  
A)  $5 \text{ m/s}^2$       B)  $-7 \text{ m/s}^2$       C)  $2 \text{ m/s}^2$       D)  $-1 \text{ m/s}^2$

Q8) An object is thrown straight up from ground-level with a speed of 48 m/s. Its height above ground level 6 seconds later is:  
A) 120 m      B) 108 m      C) 96 m      D) 84 m

Q9) Two vectors  $A$  and  $B$  are given by  $A = 4i$  and  $B = 2j$ . The scalar product of  $A$  and a third vector  $C$  is 13. The scalar product of  $B$  and  $C$  is 6. The  $z$ -component of  $C$  is 0. What is the magnitude of  $C$ ?

- A) 7.1      B) 5.0      C) 4.4      D) 6.4



Q10) A car starts moving with an initial velocity of 23 m/s north, at constant acceleration of 3 m/s<sup>2</sup> south. What is its velocity after 6 seconds?

- A) 5 m/s north      B) 5 m/s south      C) 7 m/s south      D) 7 m/s north

Q11) A racing car is moving with a constant speed of 60 m/s completes one lap (دورة) around a circular track in 40 s. What is the magnitude of the acceleration of the car?

- A) 10.2 m/s<sup>2</sup>      B) 7.5 m/s<sup>2</sup>      C) 9.4 m/s<sup>2</sup>      D) 8.2 m/s<sup>2</sup>

Q12) Vector  $A = 2i - 4j$ , and  $B = 3i + j$ . What is the direction of  $A + B$  with respect to  $+x$ -axis?

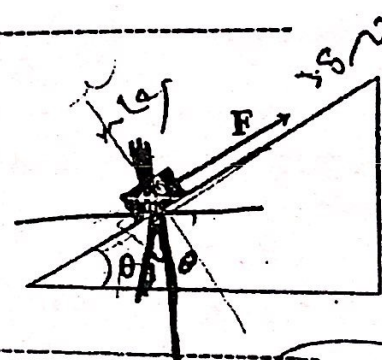
- A) 329.0°      B) 123.7°      C) 309.8°      D) 116.6°

Q13) A car is traveling toward east at constant velocity. The net force on the car is:

- A) West      B) Zero      C) East      D) Down

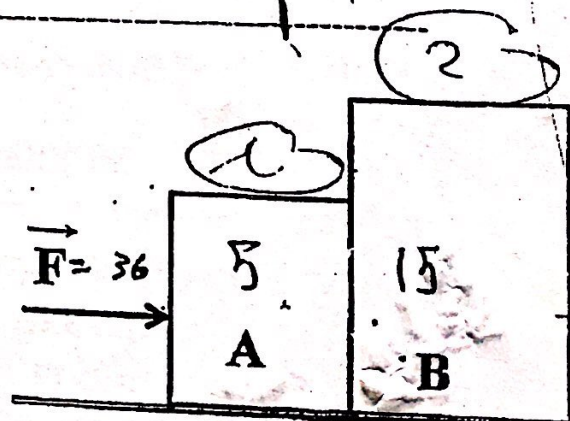
Q14) In the figure shown,  $F = 35$  N,  $m = 5$  kg. What is the magnitude of the angle of inclination ( $\theta$ ) at which the mass accelerates up with acceleration of  $a = 2$  m/s<sup>2</sup>?

- A) 36.8°      B) 44.4°  
C) 23.6°      D) 30.0°



Q15) Two blocks ( $M_A = 5$  kg and  $M_B = 15$  kg) are in contact on a horizontal frictionless surface. A force  $\vec{F} = 36$  N is applied on block A as shown. What is the magnitude of the force exerted from A on B?

- A) 27 N      B) 25.2 N  
C) 23.4 N      D) 30.0 N



F =

- 1) If  $a$  is acceleration,  $v$  is velocity,  $x$  is position, and  $t$  is time, then which equation is not dimensionally correct?  
 A)  $t = x/v$   
 B)  $a = v^2/x$   
 C)  $t^2 = 2x/a$   
 D)  $v = a/t$
- 2) Two vectors  $A$  has a magnitude of 10 units and  $B$  with a magnitude of 6 units. The angle between them is  $53^\circ$ . Find the magnitude of  $A - B$ .  
 A) 15.2  
 B) 8  
 C) 14.4  
 D) 6.3
- 3) If  $A = 3\hat{i} + 4\hat{j}$ , and  $B = 5\hat{i} - 3\hat{k}$ . What is the magnitude of  $2A - 3B$ ?  
 A) 15  
 B) 19.2  
 C) 9  
 D) 24.2
- 4) If  $B = -2\hat{i} + 2\hat{j} + 3\hat{k}$ . What is the angle between  $B$  and the  $y$  axis?  
 A)  $61^\circ$   
 B)  $43^\circ$   
 C)  $47^\circ$   
 D)  $55^\circ$
- 5) Vector  $A$  has a magnitude of 6 units along the positive  $x$  axis and vector  $B$  makes  $37^\circ$  with the positive  $x$  axis with a magnitude of 5 units. Find  $A \times B$   
 A)  $24\hat{k}$   
 B)  $12\hat{k}$   
 C)  $18\hat{k}$   
 D)  $-18\hat{k}$
- 6) An object is thrown straight up from ground level (سطح الارض) with a speed of  $60\text{ m/s}$ . Its distance above ground level 1 second later is  
 A) 45 m  
 B) 65 m  
 C) 55 m  
 D) 60 m
- 7) A car traveling with constant acceleration increases its speed from  $10\text{ m/s}$  to  $50\text{ m/s}$  over a distance of 48 m. How long does this take?  
 A) 1.6 s  
 B) 4 s  
 C) 2 s  
 D) 0.8 s
- 8) An object moves along the  $x$ -axis according to the equation  $x(t) = (t^3 + 2t)\text{m}$ . Determine the average acceleration between  $t = 2\text{ s}$  and  $t = 4\text{ s}$ .  
 A)  $36\text{ m/s}^2$   
 B)  $12\text{ m/s}^2$   
 C)  $6\text{ m/s}^2$   
 D)  $18\text{ m/s}^2$
- 9) A particle moving with a constant acceleration passes the origin with a velocity of  $7\hat{j}\text{ m/s}$ . Its position two seconds later is  $(10\hat{i} + 4\hat{j})\text{ m/s}$ . Find the magnitude of its acceleration in unit of  $\text{m/s}^2$   
 A) 9.4  
 B) 8  
 C) 13  
 D) 7.1

$$v_f = v_i + at$$

$$v_i^2 + 2a \cdot x = v_f^2$$

$$v_f = v_i + at$$

$$v_f^2 = v_i^2 + 2ax \quad a = 3\hat{i} + 4\hat{j}$$

$$2a = 3\hat{i} + 4\hat{j}$$

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	<input checked="" type="radio"/> C	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	<input type="radio"/> D	<input checked="" type="radio"/> A	<input checked="" type="radio"/> B	<input checked="" type="radio"/> A	<input type="radio"/> C	<input type="radio"/> B	<input type="radio"/> A	<input checked="" type="radio"/> A	<input type="radio"/> D	<input checked="" type="radio"/> D	<input type="radio"/> B

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 30

1. A car drives north for one hour at 80 km/h. It then continues north, traveling 100 km in 2 hours. What is its average velocity (in km/h)?  
 A) 140 north       B) 65 north       C) 60 north       D) 50 north
2. If the two vectors  $\vec{A} = 2\hat{i} + 3\hat{j} + \hat{k}$  and  $\vec{B} = 3\hat{i} + \hat{j} - 6b\hat{k}$  are perpendicular to each other. What is the value of the constant b?  
 A) 0.5       B) 2       C) -2       D) -0.5
3. A ball is thrown directly downward with an initial speed of 10 m/s, from a height of 75 m. After what time interval does it strike the ground?  
 A) 7.5 s       B) 5 s       C) 3 s       D) 15 s
4. The velocity of an object moving along the positive x-axis is given by  $v = 4t^2 + 5$ , where t in seconds. What is the average acceleration of the object between  $t = 0$  and  $t = 5$  s?  
 A) 8 m/s<sup>2</sup>       B) 16 m/s<sup>2</sup>       C) 21 m/s<sup>2</sup>       D) 20 m/s<sup>2</sup>
5. A box is given an initial speed of 10 m/s on a frozen ice. Then it slides 50 m, slowing down steadily until it comes to rest. What is the magnitude of the acceleration of the box?  
 A) 7 m/s<sup>2</sup>       B) 3.3 m/s<sup>2</sup>       C) 2 m/s<sup>2</sup>       D) 1 m/s<sup>2</sup>
6. A projectile is thrown vertically up with initial velocity  $v_0$  and reaches a maximum height of 150m. If it is thrown again with  $2v_0$ , what will be its maximum height?  
 A) 600 m       B) 300 m       C) 750 m       D) 450 m
7. A student stands at the edge of a building and throws a stone horizontally with a speed of 20m/s. If the building height is 45 m, How long does it take for the stone to hit the ground?  
 A) 2.25 s       B) 3 s       C) 0.5 s       D) 9 s
8. Which of the following quantities is not a vector?  
 A) distance       B) acceleration       C) velocity       D) displacement
9. The position of an object moving in xy-plane is given by  $\vec{r} = 5t\hat{i} - t^3\hat{j}$ , where t in seconds. What is the magnitude of the acceleration of the object at  $t = 5$  s?  
 A) 6 m/s<sup>2</sup>       B) 7.8 m/s<sup>2</sup>       C) 30 m/s<sup>2</sup>       D) 100 m/s<sup>2</sup>
10. An object moves in a circular path of radius 10 m. If the speed of the particle is given by  $v = 6t^2 + 4$ , where t in s, what is the tangential acceleration of the object at  $t = 4$  s?  
 A) 14.4 m/s<sup>2</sup>       B) 48 m/s<sup>2</sup>       C) 10 m/s<sup>2</sup>       D) 0.8 m/s<sup>2</sup>

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	C	B	D	A	B	<del>C</del>	D	C	C	B	A	D	C	D	B

Approximate your solution to those given for each question. Consider  $g = 10 \text{ m/s}^2$ .

Q1] Given the two vectors  $A = 4i + 2j$  and  $B = 3i + xj + 3k$  are perpendicular to each other, find the value of  $x$ .

- A) 6                      B) 3                      C) -6                      D) -3

Q2] An object moved from the point  $(25, 0)\text{m}$  to the point  $(0, 25)\text{m}$  in 10 seconds, find its average velocity in units of  $\text{m/s}$ .

- A)  $-2.5i - 2.5j$                       B)  $-2.5i + 2.5j$                       C)  $-5i - 5j$                       D)  $-5i + 5j$

Q3] A man walks south at a speed of  $2 \text{ m/s}$  for 15 minutes. He then turns around and walks north a distance  $2000 \text{ m}$  in 10.0 minutes. What is the average speed of the man during his entire motion (in  $\text{m/s}$ )?

- A) 3.2                      B) 2.1                      C) 1.8                      D) 2.5

Q4] A car driver noticed that the distance between his car and another car in front of him is constant and equal  $500 \text{ m}$ . If his speed was  $20 \text{ m/s}$ , what acceleration (in  $\text{m/s}^2$ ) he should apply to overtake that car in  $20 \text{ s}$ ?

- A) 3                      B) 3.5                      C) 2                      D) 2.5

Q5] A balloon is moving vertically upwards with a speed of  $10 \text{ m/s}$  when an object is dropped from it when it was at  $60 \text{ m}$  height. Find the speed of the object when it hits the ground ( $\text{m/s}$ ).

- A) 41.2                      B) 36                      C) 33.2                      D) 30

Q6] An object is dropped from a bridge. One second later a second object was dropped. Find the separation between the two objects one second after the second object has been dropped (in  $\text{m}$ ).

- A) 15                      B) 10                      C) 5                      D) 20

Q7] An object has a position given by  $r(t) = [2 + 5t]i + [3 - 4t^2]j \text{ m}$ . What is the magnitude of the acceleration of the object at time  $t = 2 \text{ s}$  (in  $\text{m/s}^2$ )?

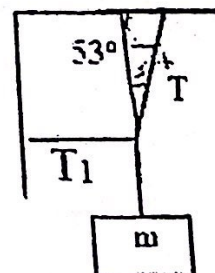
- A) 6                      B) 4                      C) 10                      D) 8

Q8] Object A has a position as a function of time given by  $r_A(t) = (3t i + t^2 j) \text{ m}$ . Object B has a position as a function of time given by  $r_B(t) = (4t i - t^2 j) \text{ m}$ . What is the distance (in  $\text{m}$ ) between object A and object B at time  $t = 4 \text{ s}$ ?

- A) 50.2                      B) 8.2                      C) 32.2                      D) 18.2

Q9] The system shown aside is in equilibrium, find the tension  $T$  in (Newton). Consider  $T_1 = 24 \text{ N}$

- A) 60                      B) 20  
C) 40                      D) 80

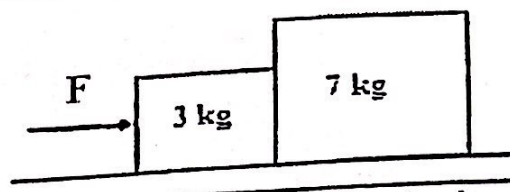


Department of Physics  
30/6/2012  
Name:

Physics 101  
First Exam  
I.D #:

JUST  
1:00 - 2:00 p.m  
Section ( ----)

Q10] Find the mutual force in Newton between the two masses shown in the figure (No friction). Consider  $F = 30 \text{ N}$

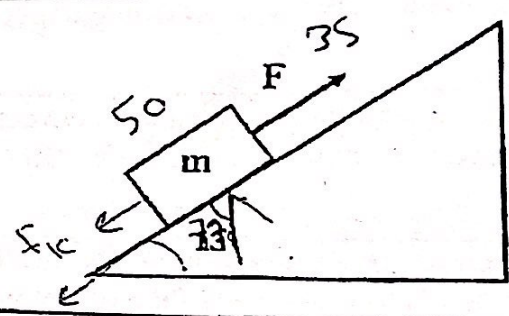


- A) 28
- B) 21**
- C) 7
- D) 14

Q11] A small stone of mass equal 0.3 kg is placed at 0.1 m from the center of a disk rotating horizontally. What is the maximum static frictional force if the coefficient of static friction is 0.5 (in N)?  $M_s = 0.5$

- A) 1.5
- B) 2
- C) 1
- D) 1.25

Q12] A 50 kg block is being pulled up a  $13^\circ$  slope by a force  $F = 350 \text{ N}$  which is parallel to the slope. The coefficient of kinetic friction between the block and the slope is 0.2. What is the acceleration of the block (in  $\text{m/s}^2$ )?



- A) 1.8
- B) 0.8
- C) 3.8
- D) 2.8**

Q13] A 4.00-kg block slides down a frictionless inclined plane with an acceleration  $4.50 \text{ m/s}^2$ . What is the angle of the incline above horizontal?

- A)  $17.5^\circ$
- B)  $23.6^\circ$
- C)  $26.7^\circ$**
- D)  $11.5^\circ$

Q14] Two vectors of lengths 12 and 15 units, their resultant cannot be;

- A) 6
- B) 4
- C) 14
- D) 2**

Q15] A ball is tied to the end of a cable of negligible mass. The ball is moving in a circle with a radius 6 m making 0.7 revolutions per second. What is the centripetal acceleration of the ball (in  $\text{m/s}^2$ )?

- A) 154.6
- B) 116**
- C) 38.6
- D) 77.3

الرقم الجامعي: ٢٠٩٠١٧١٠٠٥

الاسم: رائد سنونو المحمدي

الرقم المتسلسل: ٧٢

الشعبة: 1

المدرس: دكتور حسن الخانم

انقل رمز الإجابة الصحيحة إلى الجدول

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	C	B	B	C	D	A	C	D	A	B	B	A	D	D

Use  $g = 10 \text{ m/s}^2$ .

قرب الاجابة لأقرب عدد صحيح إن لزم ذلك  
 24 - 32  
 2

1	If $A = 12i - 16j$ and $B = -24i + 10j$ , what is the magnitude of the vector $C = 2A - B$ ? a. 64      b. 22      c. 70      d. 36	
2	If $ A  = 10$ units and $ B  = 11$ units and $A \cdot B = -100$ , find $ A + B  =$ a. 9      b. 8      c. 6      d. 5	
3	Given $A = 2i - 4j$ and $B = -3j - k$ , find the angle between A and B. a. 72      b. 51      c. 32      d. 65	
4	Two vectors $A = 2i + 3k$ and $B = -i + 2k$ . What is $A \times B$ a. $8j$ b. $-7j$ c. $4j$ d. $-j$	
5	Given $A = i - j + 3k$ and $B = 2i + j - 2k$ , find the projection A on B. a. -0.8      b. -1.7      c. -2.4      d. -2.1	
6	The position of a particle moving along the x axis is given by $x = (2t + 22t - 6.0t^2)$ m, where $t$ is in s. What is the average velocity in m/s during the time interval $t = 1$ s to $t = 3$ s? a. -14      b. -20      c. -2      d. -8	
7	A particle start from the origin with initial velocity $4i$ m/s and with a constant acceleration. Its position after 2 s is $r = 12i - 6j$ . Find its acceleration ( $\text{m/s}^2$ ). a. $-2i - 3j$ b. $-i - 3j$ c. $i - 3j$ d. $2i - 3j$	
8	A rocket fired from rest vertically with a net upward acceleration of $4 \text{ m/s}^2$ . At a height of 500 m, the engine of the rocket shutdown. What is the maximum height it reaches from the ground? a. 700 m      b. 900 m      c. 1100 m      d. 1300 m	
9	A ball is thrown horizontally from the top of the building as shown in the figure. Where $h = 100$ m and $x = 65$ m. What is the initial velocity of the ball ( $v_0$ in m/s)? a. 12.3      b. 11.5 c. 14.5      d. 13.3	
10	A ball is thrown from the top of the building as shown in the figure. Where $v_0 = 12.2$ m/s, $x = 25$ m and $\theta = 53^\circ$ . How tall (10/11)	

30 gov

الاسم: لعلي محمد عيسى بن محمد الخديجة الجاوي الرقم الجامعي: 3109008... 36  
الدروس: د. عمار قطان  
شعبة: 12

Q#	1	2	3	4	5	6	7	8	9	10	11	12
Ans	<input checked="" type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input checked="" type="checkbox"/> D	<input checked="" type="checkbox"/> D	<input checked="" type="checkbox"/> C	<input checked="" type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input checked="" type="checkbox"/> D	<input checked="" type="checkbox"/> B	<input checked="" type="checkbox"/> B	<input checked="" type="checkbox"/> D	<input checked="" type="checkbox"/> C

Consider  $g=10 \text{ m/s}^2$ ,

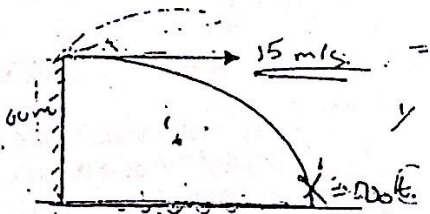
انقل رمز الإجابة الصحيحة إلى الجدول

1. A particle is moving according to equation  $X(t)=3t^2+5$ , where  $x$  in meter and  $t$  in seconds. Calculate the average velocity during the time interval  $t_1=1s$  to  $t_2=3s$ .  
A) 7.5 m/s B) 5 m/s C) 12m/s D) 8m/s
2. A car travels 160km at 80km/h and 160km at 100km/h. What is the average speed of the car?  
A) 84 km/h B) 89 km/h C) 49 km/h D) 91 km/h
3. A ball is thrown downward from the top of a building with an initial speed of 25 m/s. It strikes the ground after 2 seconds. How high is the building?  
A) 30 m B) 20 m C) 50m D) 70 m
4. A car of mass 1000kg accelerates from rest to 27 m/s in 7 seconds. What is the net force on the car?  
A)  $2.6 \times 10^2 \text{ N}$  B)  $6.8 \times 10^3 \text{ N}$  C)  $2.7 \times 10^4 \text{ N}$  D)  $3.9 \times 10^3 \text{ N}$
5. A ball is thrown from a window of 60m height with an initial velocity of 15m/s in the horizontal direction as shown in the figure. What is the horizontal distance ( $x$ )?

$v =$   
 $27 =$   
 $7/6$

height

$x =$

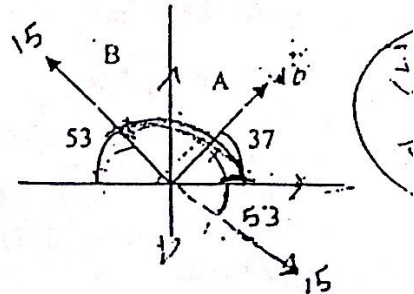


- A) 60 m B) 180 m C) 52 m D) 45 m

6. A particle moves in XY-plane with an initial velocity of  $V_0 = (2i+3j) \text{ m/s}$  and constant acceleration  $a = (3i-2j) \text{ m/s}^2$ . What is the velocity after 2s?  
A)  $2i-j$  B)  $5i-j$  C)  $6i-4j$  D)  $11i-3j$

$y =$

7. In the figure shown, the magnitude of the displacement vector  $A=10\text{m}$  and vector  $B=15\text{m}$ . What is  $A-B$ ?  $\rightarrow A + (-B)$   
A)  $-2i+18j \text{ m}$  B)  $17i-6j \text{ m}$  C)  $-17i+6j \text{ m}$  D)  $-6i+17j \text{ m}$



8. If the position of an object is given by  $X(t) = (2t^3 - 5t - 16)$ , where  $t$  is in seconds and  $X$  is in meters, the acceleration at  $t=2s$  is:  
A)  $2 \text{ m/s}^2$  B)  $10 \text{ m/s}^2$