

Mutah University-Physics Department  
Medical Physics 100-Mid Exam

رقم التسلسل:

الإسم:  
الشعبة:

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

12345678910

badccbdcad

1. If  $x$  and  $t$  represent position and time, respectively, the dimension of A in

$$x(t) = At + Bt^2 \text{ must be}$$

- a)  $L/T^2$                       b)  $L/T$                       c)  $LT^2$                       d)  $LT$

Given  $\vec{A} = -3\hat{x} + 2\hat{y}$  and  $\vec{B} = \hat{x} - 3\hat{y}$ . The magnitude of  $2\vec{A} - \vec{B}$  is .2

- a) 9.9                      b) 12.5                      c) 8.1                      d) 5.7

3. A car travels 40 Km at an average speed of 80 km/h and then travels 40 Km at an average speed of 40 km/h. The average speed of the car for this 80-km trip is:

- a) 50 km/h                      b) 68.8 km/h                      c) 48.7 km/h  
d) 53.3 km/h

4. A ball is thrown directly downward with an initial velocity of 5 m/s from a height of 30 m, when does the ball strike the ground?

- a) 5 s                      b) 4 s                      c) 2 s  
d) 3 s

5. A particle goes from  $x = -2\text{m}$ ,  $y = 3\text{m}$ , to  $x = 3\text{m}$ ,  $y = -2\text{m}$ . Its vector displacement is

- a)  $\hat{x} + 2\hat{y}$                       b)  $5\hat{x} - 4\hat{y}$                       c)  $5\hat{x} - 5\hat{y}$                       d)  $-\hat{x} - 2\hat{y}$

6. A man of mass 72 kg climb a hill of height 60 m in 6 minutes. what is the power he delivered by him?

- a) 155 W                      b) 120 W                      c) 187 W                      d) 133 W

7. An airplane flies horizontally with speed of 300 m/s at an altitude of 500 m. What horizontal distance from a target must the pilot release a bomb so as to hit the target?

- a) 2700 m                      b) 2400 m                      c) 3300 m                      d) 3000 m

8. An object moves along the x-coordinate according to the equation  $x(t)=(3-4t^2)$  m. The average velocity between  $t = 1$  and  $t = 2$  s is

- a) 8 m/s                      b) 12 m/s                      c) -12 m/s                      d) 16 m/s

9. A particle is traveling at a speed of 4 m/s and comes to rest after undergoing a constant negative acceleration for 40 m. How long does it take the particle to come to rest?

- a) 20 s                      b) 8 s                      c) 5 s                      d) 10 s

10. A woman pushes a toy car initially at rest by exerting a constant horizontal force of magnitude 5 N, the car moves 1 m. If the mass of the car is 0.2 kg. What is its final speed?

- a) 5 m/s                      b) 5.8 m/s                      c) 4.5 m/s                      d) 7.1 m/s







8. At  $t = 0$ , a particle leaves the origin with a velocity  $\vec{v}_0 = 16\hat{y}$  m/s. Its acceleration is given by  $\frac{d\vec{v}}{dt} = (3\hat{x} - 4\hat{y})$  m/s<sup>2</sup>. What is the time the particle takes to reach the maximum y coordinate

- (a) 4 s                      (b) 6 s                      (c) 2 s                      (d) 3 s

9. If the only forces acting on a 2.0-kg mass are  $\vec{F}_1 = (3\hat{x} - 3\hat{y})$  N and  $\vec{F}_2 = (5\hat{x} + 3\hat{y})$  N, what is the magnitude of the acceleration of the particle?

- a) 4 m/s<sup>2</sup>                      b) 6 m/s<sup>2</sup>                      c) 4.7 m/s<sup>2</sup>                      d) 9.4 m/s<sup>2</sup>

10. The apparent weight of a fish in an elevator is greatest when the elevator

- a) moves downward at constant velocity    b) moves upward at constant velocity.  
c) accelerates upward.                      d) accelerates downward

**A**  
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 المدرس:

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

1	2	3	4	5	6	7
b	d	d	b	d	a	c
8	9	10	11	12	13	
c	d	a	d	b	d	

1. If  $x$  and  $t$  represent position and time, respectively, the dimension of A in

$$x(t) = At + Bt^2 + \frac{C}{t} + \frac{D}{t^2} \text{ must be}$$

- (a)  $L/T^2$                       (b)  $L/T$                       (c)  $LT^2$                       (d)  $LT$

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

- (a)  $233^\circ$                       (b)  $323^\circ$                       (c)  $37^\circ$                       (d)  $143^\circ$

3. Starting from on oasis (واحة), a camel walks 25 km in direction  $30^\circ$  south of west and then walks 30 km towards the north to second oasis. What distance separates the two oasis?

- (a) 48 km                      (b) 53 km                      (c) 15 km                      (d) 28 km

4. An object moves along the  $x$ -axis according to the equation  $x(t) = (20t - 6t^2 - 4t^3)$  m. What is the **speed** (in m/s) of the object at  $t = 1$  s?

- (a) 52                      (b) 4                      (c) -4                      (d) -52

5. A particle travels in the positive  $x$  direction with a constant velocity of 4 m/s. It

then accelerates uniformly at  $2 \text{ m/s}^2$  in a time interval of 5 s. What is its average velocity (in m/s) during that time interval?

- (a) 4 (b) 14 (c) 2 (d) 9

6. A particle is traveling at a speed of 4 m/s and comes to rest after undergoing a constant negative acceleration for 40 m. How long (in s) does it take the particle to come to rest?

- (a) 20 (b) 8 (c) 5 (d) 10

7. A ball is thrown vertically upward from the ground with an initial speed of 3 m/s. How long (in s) does it take the ball to reach its maximum height?

- (a) 0.7 (b) 0.9 (c) 0.3 (d) 0.5

8. The two forces  $\vec{F}_1 = (3\hat{i} + 8\hat{j}) \text{ N}$  and  $\vec{F}_2 = (5\hat{i} + 2\hat{j}) \text{ N}$  are the only forces acting on a 1 kg object. What is the acceleration of the object (in  $\text{m/s}^2$ ).

- (a) 4 (b) 7 (c) 10 (d) 5

9. A 2 kg object is moving along x-axis. What is the work done in (J) in changing its velocity from 4 m/s to 6 m/s?

- (a) 16 (b) 48 (c) 32 (d) 20

10. At  $t = 0$  a particle leaves the origin with a velocity of 5.0 m/s in the positive y direction. Its acceleration is given by  $\frac{d^2y}{dt^2} = 3t - 2$   $\text{m/s}^2$ . At the instant the particle reaches its maximum y coordinate how far is the particle to the origin?

- (a) 11 m (b) 16 m (c) 22 m (d) 29 m

11. An airplane flies horizontally with speed of 300 m/s at an altitude of 500 m. What horizontal distance from a target must the pilot release a bomb so as to hit the target?

- (a) 2.7 km (b) 2.4 km (c) 3.3 km (d) 3.0 km

12. A man of mass 72 kg climb (يتسلق) a hill (تلة) of height 60 m in 6 minutes. what is the power he delivered by him?

- (a) 155 W (b) 120 W (c) 187 W (d) 133

W

13. A woman pushes (تدفع) a toy car initially at rest by exerting (تؤثر) a constant horizontal force of magnitude 5 N, the car moves 1 m. If the mass of the car is

0.2 kg. What is its final speed?

(a) 5 m/s

(b) 5.8 m/s

(c) 4.5 m/s

(d) 7.1 m/s

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8	9	10	11	12	13	
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1. If  $x$  and  $t$  represent position and time, respectively, the dimension of A in must be  
 (a)  $L/T^2$                       (b)  $L/T$                       (c)  $LT^2$                       (d)  $LT$
  
2. If  $\alpha$ ,  $\beta$ , and  $\gamma$ , what is the angle that the vector makes with the positive  $x$ -axis?  
 (a)  $233^\circ$                       (b)  $323^\circ$                       (c)  $37^\circ$                       (d)  $143^\circ$
  
3. Starting from on oasis (واحة), a camel walks 28 km in direction  $30^\circ$  south of west and then walks 28 km towards the north to second oasis. What distance separates the two oasis?  
 (a) 48 km                      (b) 53 km                      (c) 15 km                      (d) 28 km
  
4. An object moves along the  $x$ -axis according to the equation  
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 (a) 52                      (b) 4                      (c) -4                      (d) -52
  
5. A particle travels in the positive  $x$  direction with a constant velocity of 4 m/s. It then accelerates uniformly at  $2 \text{ m/s}^2$  in a time interval of 5 s. What is its average velocity (in m/s) during that time interval?  
 (a) 4                      (b) 14                      (c) 2                      (d) 9
  
6. A particle is traveling at a speed of 4 m/s and comes to rest after undergoing a constant negative acceleration for 40 m. How long (in s) does it take the particle to come to

rest?

- (a) 20  
10
- (b) 8
- (c) 5
- (d)

7. A ball is thrown vertically upward from the ground with an initial speed of 3 m/s. How long (in s) does it take the ball to reach its maximum height?

- (a) 0.7  
0.3
- (b) 0.9  
(d) 0.5
- (c)

8. The two forces and are the only forces acting on a 1 kg object. What is the acceleration of the object (in  $\text{m/s}^2$ ).

- (a) 4  
10
- (b) 7  
(d) 5
- (c)

9. A 2 kg object is moving along x-axis. What is the work done in (J) in changing its velocity from 4 m/s to 6 m/s?

- (a) 16  
20
- (b) 48
- (c) 32
- (d)

10. A 10 kg block is released from rest 10 m above the ground. When it has reached the ground its kinetic energy (in J) is:

- a) 1000
- b) 4000
- c) 1200
- d) 2200

11. An airplane flies horizontally with speed of 300 m/s at an altitude of 500 m. What horizontal distance from a target must the pilot release a bomb so as to hit the target?

- (a) 2.7 km  
km
- (b) 2.4 km
- (c) 3.3 km
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