# Mutah University-Physics Department Medical Physics 100-Mid Exam

الإسم: رقم التسلسيل: الشعبة: <u>Note</u>: g = 10 m/s<sup>2</sup>

 $1\,2\,3\,4\,5\,6\,7\,8\,9\,10$ 

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S

- 1. If x and t represent position and time, respectively, the dimension of A in  $x(t) = At + Bt^{2}$  must be a) L/T<sup>2</sup> b) L/T c) LT<sup>2</sup> d) LT
  - Given  $\overset{ff}{A} = -3\hat{x} + 2\hat{y}$  and  $\overset{ff}{B} = \hat{x} 3\hat{y}$ . The magnitude of  $2\overset{ff}{A} \overset{ff}{B}$  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 d) 3 s
- 5. A particle goes from x = -2m, y = 3m, to x = 3m, y = -2m. 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?

W

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

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 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

## Mu'tah University-Physics Department Medical Physics 100-First Exam



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

1. if x and t represent distance and time, respectively, the c in the relation  $x=1/2ct^2$  must have the dimension

a)  $L/T^2$  b)  $M L/T^2$  c) L/T d) L/T<sup>3</sup> 2. Given  $A = -3\hat{i} + 2\hat{j}$  and  $B = \hat{i} - 3\hat{j}$ . The magnitude of 2A - B is

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

3. Starting from one oasis, a camel walks 25 km in a direction  $30^{\circ}$  south of west and then walks 30 km toward the north to a second oasis. What distance separates the two oases?

a) 18.3 km	b) 15 km	c) 27.8 km	d)

53.6 km

4. 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

 $m/s^2$ 

5. An automobile moving along a straight track changes its velocity from 40 m/s to 80 m/s in a distance of 200 m. What is the (constant) acceleration of the vehicle during this time?

a) 
$$24 \text{ m/s}^2$$
 b)  $18 \text{ m/s}^2$  c)  $12 \text{ m/s}^2$  d) 6

- 6. 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

A Particle starts from the origin at t = 0 with a velocity of 3j and moves in the xy .7

plane with a constant acceleration of  $4i \text{ m/s}^2$ . At the instant the x coordinate of ?the particle is 32 m, what is the value of its y coordinate

- a) 40 m b) 12 m c) 36 m d) 24 m
- 8. A particle goes from x = -2m, y = 3m, to x = 3m, y = -2m. Its vector displacement is
  - a) i+2j b) 5i-4j c) 5i-5j d) -i-2j

9. An object moving at a constant speed requires 3.14 s to go once a round a circle with radius of 1.5 m, what is the centripetal acceleration of the particle during this time?

- a)  $6 \text{ m/s}^2$  b)  $2 \text{ m/s}^2$  c)  $4 \text{ m/s}^2$  d)  $8 \text{ m/s}^2$
- 10. A stone is thrown from the top of a hill with initial velocity of 20 m/s at an angle of 37°. If it reaches the ground after 3 s. The height of the hill is,

a) 32 m b) 36 m c) 9 m d) 45 m.

## Mu'tah University-Physics Department Physics 100-First Exam



1. A force of 1N is equal to

a)  $1 \text{ kg.m/s}^2$  b) 1 kg.m/s c) 1 kg/s d)  $1 \text{ kg.m}^2/\text{s}$ 2. Given  $A = -2\hat{x} + \hat{y}$  and  $B = 2\hat{x} - 4\hat{y}$ , the magnitude of A = B is (a) 12 (b) -2 (c) 5 (d) 3

- **3.** A person walks 12 m,  $60^{\circ}$  north of east, and then walks 12 m,  $60^{\circ}$  north of west, the magnitude and direction of the resultant displacement is
  - (a)  $20.8 \text{ m}, 90^{\circ}$  (b)  $12 \text{ m}, 120^{\circ}$  (c)  $20.8 \text{ m}, 60^{\circ}$  (d)  $12 \text{ m}, -30^{\circ}$
- 4. The velocity of a particle moving along the x axis is given by  $v(t) = 4 + 12t 3t^2$ , what is the average acceleration of the particle during the time interval t=0 to t=2 s.
  - (a)  $16 \text{ m/s}^2$  (b)  $6 \text{ m/s}^2$  (c)  $12 \text{ m/s}^2$  (d)  $40 \text{ m/s}^2$
- **5.** An object moved in one dimension with velocity 5 m/s for 60 s, then with 10 m/s for 90 s, and finally with -10 m/s for 60 s. The average speed of the object during the whole trip is:

(a) zero (b) 2.9 m/s (c) 6 m/s (d) 8.6 m/s

- **6.** An object was dropped from the window of a tall building hit the ground in 4 s. The height of the window above the ground is
  - (a) 245 m (b) 80 m (c) 180 m (d) 320 m
- 7. 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 4 s, the height of the hill is

(a) 40 m	(b) 80 m	(c) 16 m	(d) 32 m
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8. At t = 0, a particle leaves the origin with a velocity  $\frac{16\hat{y}}{16\hat{y}} = 16\hat{y}$  m/s. Its acceleration is given by  $\frac{16\hat{y}}{16\hat{y}} = (3\hat{x} - 4\hat{y}) \text{ m/s}^2$ . 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  $F_1^{\text{fJ}} = (3\hat{x} - 3\hat{y})$  N and  $F_2^{\text{fJ}} = (5\hat{x} + 3\hat{y})$  N, what is the magnitude of the acceleration of the particle?

a) 
$$4 \text{ m/s}^2$$
 b)  $6 \text{ m/s}^2$  c)  $4.7 \text{ m/s}^2$  d)  $9.4 \text{ m/s}^2$ 

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

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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  $x(t) = At + Bt^2 + \frac{C}{t} + \frac{D}{t^2}$  must be (a) L/T<sup>2</sup> (b) L/T (c) LT<sup>2</sup> (d) LT
- 2. If  $\overrightarrow{A} = 3i 4j$ ,  $\overrightarrow{B} = 2i + 3j$ , and  $\overrightarrow{C} = i + 2j$ , what is the angle that the vector -  $\overrightarrow{A} = \overrightarrow{B} + \overrightarrow{C}$  makes with the positive x-axis? (a) 233° (b) 323° (c) 37° (d) 143°
- **3.** Starting from on oasis (واحة), a camel walks 25 km in direction 30<sup>0</sup> 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  $F_1 = (3 2 8 j)$  and  $F_2 = (5 2 2 j)$  are the only forces acting on a 1 kg object. What is the acceleration of the object (in m/s<sup>2</sup>).

(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  $3i 2i m/s^2$ . 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 (تدفع) 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) $5 \text{ m/s}$ (b) $5.8 \text{ m/s}$ (c) $4.5 \text{ m/s}$	(d) $7.1 \text{ m/s}$
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### Mu'tah University/Physics Department Medical Physics 100/ Mid Exam

المدرس:

رقم التسلسل:

الاسم:

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

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

- 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 , , and , 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<sup>0</sup> 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 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?
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- **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 v long (in s) does i	vertically upward from the gro t take the ball to reach its max	ound with an initial speed imum height?	of 3 m/s. How
(a) 0.7	(b) 0.9	(c)	
0.3	(d) 0.5		
8. The two forces an of the object (in 1	nd are the only forces acting o $m/s^2$ ).	n a 1 kg object. What is t	he acceleration
(a) 4	(b) 7	(c)	
10	(d) 5		
9. A 2 kg object is r velocity from 4 n	noving along x-axis. What is t n/s to 6 m/s?	he work done in (J) in ch	anging its
(a) 16 20	(b) 48	(c) 32	(d)
<b>10.</b> A 10 kg block is ground its kinetic	s released from rest 10 m abov e energy (in J) is:	e the ground. When it ha	s reached the
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 (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?

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