King Abdulaziz University
Faculty of Sciences
Physics Department

First Exam - Phys 110

Second Term
1433-1434 H

Date: 7 /5/ 1434 H

A

Name:	ID No:	Section:

**CHOOSE THE CORRECT ANSWER**

1. The displacement of a boy moving with average velocity of 1.2 m/s in 2 minutes is

   a) 200 m   **b)** 150 m   **c)** 144 m   **d)** 100 m

2. 10^3 kg/m³ = ...

   a) 1 g/cm³   **b)** 10 g/cm³   **c)** 10^2 g/cm³   **d)** 10^3 g/cm³

3. If 1 inch = 2.54 cm, the conversion factor to convert 2 inch to cm is

   a) $\dfrac{1\ inch}{2.54\ cm}$ **b)** $\dfrac{2\ inch}{2.54\ cm}$ **c)** $\dfrac{2.54\ cm}{1\ inch}$ **d)** $\dfrac{2.54\ cm}{2\ inch}$

4. 467 micrometer =

   a) 4.67 x 10^{-5} m   **b)** 4.67 x 10^{-3} m   **c)** 4.67 x 10^{-4} m   **d)** 4.67 x 10^{-2} m

5. The rate of change of position with time is :

   a) distance   **b)** velocity   **c)** acceleration   **d)** speed

6. $\vec{A}$ and $\vec{B}$ are two vectors as shown in the figure, which of the following is TRUE ?
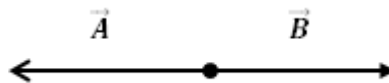
   a) $\vec{A} \times \vec{B} = 0$ **b)** $\vec{A} \cdot \vec{B} = 0$ **c)** $\vec{A} \times \vec{B} = 1$ **d)** $\vec{A} \cdot \vec{B} = 1$

7. Which of the following situations is NOT possible?

    a) A body having constant velocity and changing acceleration.
    b) A body having changing velocity and constant acceleration.
    c) A body having positive velocity and positive acceleration.
    d) A body having positive velocity and negative acceleration.

8. A boat قـارب moves (10 km west), then (5 km north), and finally (10 km east). The displacement of the boat from its initial position is

    a) 5 km, South   **b)** 5 km, North   **c)** 10 km, East   **d)** 0 km

9. A vector $\vec{a}$ has a magnitude of 1 unit and in a direction $10°$ with the positive x-axis, $\vec{a}$ in unit vector notation is:

    a) $0.98\hat{i} + 0.17\hat{j}$ **c)** $0.53\hat{i} + 0.42\hat{j}$
    b) $0.29\hat{i} + 20\hat{j}$ **d)** $0.23\hat{i} + 14j$

10. Two vectors of the same magnitude (1 unit) are added; one is directed to the east and one is to the west. The magnitude of the resultant vector is

    a) 1   **b)** 2   **c)** 3   **d)** 0

11. If the vectors $\vec{A} = \hat{i} + \hat{j}$ and $\vec{B} = -\hat{i} + \hat{j}$, then $\vec{A} \times \vec{B}$ is :

    a) $2\,\hat{k}$ **b)** $-2\hat{i} - 2\hat{k}$ **c)** $2\hat{i} + 2\hat{k}$ **d)** $-\hat{i} + \hat{j} - \hat{k}$

12. A car's speed is 30 m/s, after traveling 50 m with constant acceleration it reaches 15 m/s, its acceleration is

    a) -6.75 m/s²   **b)** -11.25 m/s²   **c)** 6.75 m/s²   **d)** 11.25 m/s²

13. The speedometer عداد السرعة in the car measures يقيـــس :

    a) velocity   **b)** speed   **c)** acceleration   **d)** displacement

Use the following to answer questions 14-15:

The position of a body moving along the x-axis is given by: $x = 3t - 4t^2 + t^3$

14. The average velocity for the time interval from t = 0 s to t = 5 s is:

    a) $v_{avg.} = 40$ m/s   **b)** $v_{avg.} = 48$ m/s   **c)** $v_{avg.} = 20$ m/s   **d)** $v_{avg.} = 8$ m/s

15. The position of the body at t = 4s is:

   a) $x = 12\ m$ **b)** $x = -3\,m$ **c)** $x = 3\ m$ **d)** $x = -12\ m$

16. A particle had a speed of 15 m/s in the positive x direction and 2s later its speed was 33 m/s in the opposite direction. The average acceleration of the particle is:

   a) -20 m/s²   **b)** -24 m/s²   **c)** 20 m/s²   **d)** 24 m/s²

17. As shown in the figure, if the magnitudes of $\vec{a}$ and $\vec{b}$ are 10 units and 25 units, respectively على التوالــي , the x-component of the resultant of $\vec{a}$ and $\vec{b}$ is:
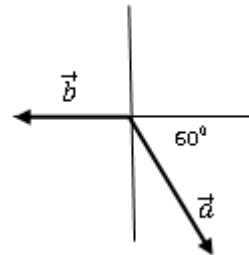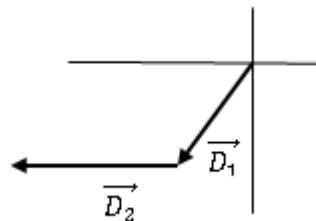

   a) -20 units   **b)** -30 units   **c)** -2.5 units   **d)** -22.5 units

18. Raindrops قطرات المطر fall 1700 m from a cloud to the ground, the drops's velocity as they reached the ground is:

   a) 0   **b)** -183 m/s   **c)** 58 m/s   **d)** -129 m/s

19. In the figure, the signs of the x and y components of the vector $\vec{D}_1 - \vec{D}_2$ are:
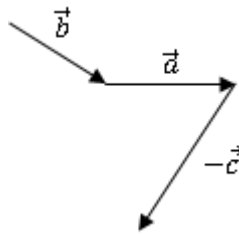

   a) (+ , +)   **b)** (- , -)   **c)** (+ , -)   **d)** (- , +)

20. The position of a particle is given by: $x(t) = 20\,t - 5t^3$ (where x is in meters and t in seconds). Is there ever a time when $a = 0$?

   a) t =0   **b)** t =30 s   **c)** t =15 s   **d)** t =10s

21. The vector sum $\vec{S}$ of the vectors in the diagram is equal to:

a) $\vec{S}=\vec{a}+\vec{b}+\vec{c}$ **b)** $\vec{S}=\vec{b}-\vec{a}-\vec{c}$ **c)** $\vec{S}=\vec{b}+\vec{a}-\vec{c}$ **d)** $\vec{S}=\vec{b}+\vec{a}$

Use the following to answer questions 22-23:

Two vectors $\vec{a}$ and $\vec{b}$ of magnitudes 10 units and 6 units, respectively علــى التوالـي , and the angle between the directions of $\vec{a}$ and $\vec{b}$ is 60^0.

22. The magnitude of the vector product of $\vec{a}$ and $\vec{b}$ is:

a) 40 units **b)** 52 units **c)** 20 units **d)** 26 units

23. The scalar product of the two vectors $\vec{a}$ and $\vec{b}$ is:

a) 30 units **b)** 60 units **c)** 50 units **d)** 20 units

24. A vector $2\vec{B}$ has x, y, and z components as 2, 4, and 10, respectively. The vector $\vec{B}$ can be written as:

a) $2\hat{i}+4\hat{j}+10\hat{k}$ **b)** $2\hat{i}+2\hat{j}+10\hat{k}$ **c)** $\hat{i}+2\hat{j}+5\hat{k}$ **d)** $2\hat{j}+5\hat{k}$

25. The x component of vector $\vec{a}$ is $a_x=2.6$ m, if the angle between $\vec{a}$ and the positive x-axis is -41^0, then the magnitude of $\vec{a}$ is:

a) 3 m **b)** 2 m **c)** 4.58 m **d)** 3.45 m

26. How long will it take an apple falling from a 29.4 m tall tree to hit the ground ?

a) 3.72 s **b)** 1.56 s **c)** 2.04 s **d)** 2.45 s

27. (0.000 000 0782) is equal to :

a) 7.82×10^{-6} **b)** 7.82×10^{-8} **c)** 7.82×10^{-9} **d)** 7.82×10^{-7}

Use the following to answer questions 28-30:

If $\vec{a}=4\,\hat{i}-3\,\hat{j}$ and $\vec{b}=6\,\hat{i}+8\,\hat{j}$

28. The direction of $\vec{b}$

    a) 43^0 **b)** 60^0 **c)** 53^0 **d)** 58^0

29. The magnitude of $\vec{a}$

    a) 4 **b)** 5 **c)** 6 **d)** 7

30. $\vec{b} - \vec{a} =$

    a) $\hat{i} + 3\hat{j}$ **b)** $-2\hat{i} - 5\hat{j}$ **c)** $4\hat{i} - 3\hat{j}$ **d)** $2\hat{i} + 11\hat{j}$

31. A particle moves along the x-axis according to the equation $x = 4 - 46t - 4t^3$ (where x is in meters and t in seconds), therefore, at t = 0 s :

    a) The speed is zero
    b) The speed is 46 m/s in the positive direction of x.
    c) The speed is 50 m/s in the positive direction of x.
    d) The speed is 46 m/s in the negative direction of x.

32. The SI units of base quantities (Length , Mass , Time) are

    a) Km , Kg , s **b)** cm , g , s **c)** cm , Kg , s **d)** m , Kg , s

33. $(1 \text{ nm})^2 =$

    a) 10^{-18} m^2 **b)** 10^{+9} m^2 **c)** 10^{-9} m^2 **d)** 10^{+18} m^2

Answer Key

1. c
2. a
3. c
4. c
5. b
6. a
7. a
8. b
9. a
10. d
11. a
12. a
13. b
14. d
15. a
16. b
17. a
18. b
19. c
20. a
21. c
22. b
23. a
24. c
25. d
26. d
27. b
28. c
29. b
30. d
31. d
32. d
33. a