Phys 110

Student Name :	Student Number:	Group:
Section:		

Choose The Correct Statement (True) or (False)?

1. In projectile motion the horizontal acceleration is Zero.
   a) True   b) False

2. The horizontal range R is maximum for a launch angle of 90
   a) True   b) False

3. A nanosecond is 10^8 s
   a) True   b) False

4. If no net force acts on a body .the body's velocity cannot change , then the body cannot accelerate.
   a) True   b) False

5. The instantaneous acceleration is $\vec{a} = \dfrac{\vec{v}_1 - \vec{v}_2}{\Delta t}$
   a) True   b) False

6. The magnitude of $\vec{f}_s$ has maximum value that is given by: $f_{smax} = \mu_s F_N$
   a) True   b) False

7. The value of $\hat{k} \cdot \hat{i}$ is Zero .
   a) True   b) False

8. The magnitude of the gravitational force is equal to the product (ma).
   a) True   b) False

9. The SI unit of kinetic energy is: kg.m/s^2.
   a) True   b) False

10. In Newton's 2nd law, the net force and acceleration are in the same directions.
    a) True   b) False

11. The velocity is defined as the change in position from initial position to final position.
    a) True   b) False

12. Watt is equal to: Joule per second
    a) True   b) False

13. The SI base unit for mass is gram.
    a) True b) False

14. The angle between the vector $\vec{A}$ given by; $\vec{A} = (25m)\hat{\imath} + (45m)\hat{\jmath}$ and the positive x-axis is: $61°$.
    a) True b) False

15. A 5kg object moving at a speed of 6 m/s, its kinetic energy is 80 Joule.
    a) True b) False

16. The time rate of change of the linear momentum of a particle is equal to the net force acting on it (**i.e** $\vec{F}_{net} = \dfrac{d\vec{P}}{dt}$).
    a) True b) False

Choose the Correct Answers :

17. A man weighing 800 N is standing in an elevator moving with a constant velocity. The force exerted by the man on the floor of the elevator is:
    a) less than 80 N   b) 800 N   c) between 80 and 800 N
    d) more than 800 N

18. What is the speed of a 55 kg woman running with a kinetic energy of 412.7 J?
    a) 15 m/s   b) 3.87 m/s   c) 2.7 m/s   d) 4 m/s

19. A ball kicked with a velocity of 15 m/s and with an angle of $\theta = 45°$ from the horizontal. The maximum range is:
    a) 25.85 m   b) 40.82m   c) 50.20 m   d) 22.96 m

20. In the projectile motion, the maximum range is:
    a) $\dfrac{v_0^2}{g}(\cos\theta)$ b) $\dfrac{v_0^2}{g}$ c) $\dfrac{v_0}{g}$ d) $\dfrac{v_0^2}{g}(\cos\theta)^2$

21. A man stands on the groun, if his mass is 80 kg, his weight is:
    a) 7.84 N   b) 784 N   c) 78.4 N   d) 7840 N

22. Having two vectors $\vec{A} = 2\hat{i} + 3\hat{j}$ and $\vec{B} = \hat{i} - 2\hat{j} + \hat{k}$, the result of $\vec{A} \times \vec{B}$ is:
    a) $3\hat{\imath} + 5\hat{\jmath} - 3\hat{k}$ b) 0   c) $3\hat{i} - 2\hat{j} - 7\hat{k}$ d) $\hat{i} - \hat{j}$

23. One Newton (1 N) in SI is equal to
    a) $\dfrac{1\ kg.m}{s}$ b) $\dfrac{1\ kg.m}{s^2}$ c) $\dfrac{1\ kg\ cm}{s}$ d) $\dfrac{1\ g.m}{s}$

24. The position of a car changes from $x_1 = 30m$ to $x_2 = 120m$ in the time interval from 2s to 4s, the average velocity of the car is :
    a) 30m/s   b) 40m/s   c) 20 m/s   d) 45m/s

25. An object dropped from a height of 80m, its speed after 3 s is:
    a) 33 m/s   b) -29.4m/s   c) -9.8 m/s   d) 39.5m/s

26. The expression that represents a stationary box in the figure is:
    a) $F_N + F \sin\theta = mg$
    b) $F_N - F \sin\theta = mg$
    c) $F \cos\theta - F_k = mg$
    d) $F_N + F\cos\theta - mg$
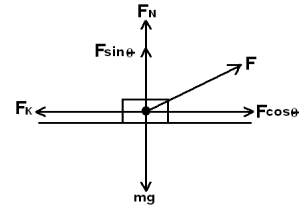
27. If $\vec{A} = 2\hat{\imath} + 2\hat{\jmath}$ and $\vec{B} = 2\hat{\imath} - 4\hat{\jmath}$, the resultant vector $\vec{A} + \vec{B}$ is:
    a) $2\hat{\imath}+4\hat{\jmath}$ b) $4\hat{\imath}$-2$\hat{\jmath}$ c) $4\hat{\imath}+2\hat{\jmath}$ d) $2\hat{\imath}$-4$\hat{\jmath}$

28. if A=10 units and B=6 units, the angle between them is 60°, the dot product of the vectors ($\vec{A} \cdot \vec{B}$) is:
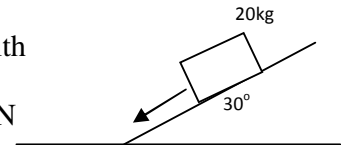   a) 20 unit   b) 30 unit   c) 51.96 unit   d) 60 unit

29. A force was applied on an object of mass 50 kg with speed 32 m/s, the linear momentum is:
    a) 1600 kg.m/s   b)1900 kg.m/s   c) 1500 kg.m/s   d)1700 kg.m/s

30. A 20 kg object is sliding down in an incline smooth plane with 30° with the horizontal , the net force in direction of sliding is:
    a) 49N   b) 98 N   c) 196 N   d) 294 N

31. A force acts on a spring with length 30 cm. This force compressed it by 25cm. The spring constant is k=50 N/m, the work done by the spring is:
    a)10 joule   b) 1.6 joule   c) 0.69 joule   d) 0.55 joule

32. An object is moving in the positive direction of the x-axis with a relationship $x(t)=8+2t+3t^2$, the instantaneous velocity after $2s$ is:
    a) 24m/s   b) 2+6t   c) 14m/s   d) 12m/s

33. The direction of friction is always _____ to the direction in which the object is moving.
    a) perpendicular   b) opposite   c) normal   d) similar

34. When a 20 N force acts on an object then it moves 20 m in the same direction. The work is:
    a) -40 J   b) 40 J   c) 400 J   d) -400 J

35. Which of the following relation gives negative displacement
    a) $x_1= - 2m$, $x_2= 4m$ c) $x_1= - 8m$, $x_2= - 1m$
    b) $x_1= 6m$, $x_2= - 2m$ d) $x_1= 7m$, $x_2= 9m$

36. A ball is thrown with initial velocity of 15 m/s at an angle of 30° from the positive x direction. The y-component of the initial velocity is :
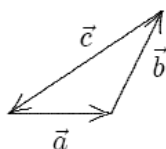   a)30 m/s   b) 7.5 m/s   c)15 m/s   d) 13m/s

37. In the figure, what is the magnitude of the force F_3 acting on particle 3 if the center of mass of the system is stationary?
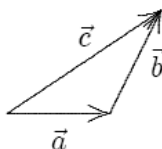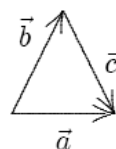   a) 8 N   b) – 2 N   c) -8 N   d) 2 N
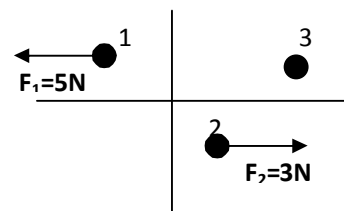
38. The vectors $\vec{a}, \vec{b},$ and $\vec{c}$ are related by $\vec{a} + \vec{c} = \vec{b}$. Which diagram below illustrates (يوضح) this relationship (العلاقة)?

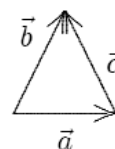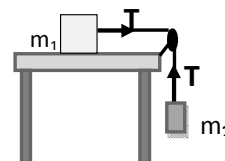   A   B   C   D

39. If the components of the vector A are given by $A_x = 8.6$ cm and $A_y = 4.20$ cm, then the direction of this vector with respect to the positive x-axis is:
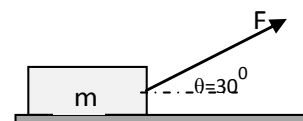   a) 32°   b) 60°   c) 26°   d) 180°

40. In the figure shown; m_2 moves down with acceleration of 2 m/s^2 , the tension in the rope is 10 N. The value of m_2 is:
    a) 2.5 kg   b) 1.28 kg   c) 8.0 kg   d) 50 kg

41. A block was pulled by a force 30 N, the block was going with a constant speed (as shown in the figure) on a rough (خشن) surface. The magnitude of the frictional force is:
    a) 26 N   b) 15 N   c) 98 N   d) 3 N

42. Each of four particles moves along an x axis. Their coordinates (in meters) as functions of time (in seconds) are given by:
    particle 1: $x(t) = 3.5 - 2.7t^3$ particle 2: $x(t) = 3.5 + 2.7t^3$
    particle 3: $x(t) = 3.5 + 2.7t^2$ particle 4: $x(t) = 3.5 - 3.4t - 2.7t^2$
    Which of these particles have constant acceleration?
    a) All four   b) Only 1 and 2   c) Only 2 and 3   d) Only 3 and 4

43. If A=10 and B=6, the angle between them is $60°$, the magnitude of the vector product $\vec{A} \times \vec{B} =$
    a) 20   b) 30   c) 51.96   d) 60

44. A particle moves through a **displacement** $\vec{d} = (15m)\hat{i} - (12m)\hat{j}$ along a straight line while being acted on by a **force** $\vec{F} = (210N)\hat{i} - (150N)\hat{j}$. **The work** done on the particle by this force is:
    a) 4950 J   b) 1350 J   c) 3150 J   d) 1800 J