

Student Name:

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**CHOOSE THE CORRECT ANSWER:**

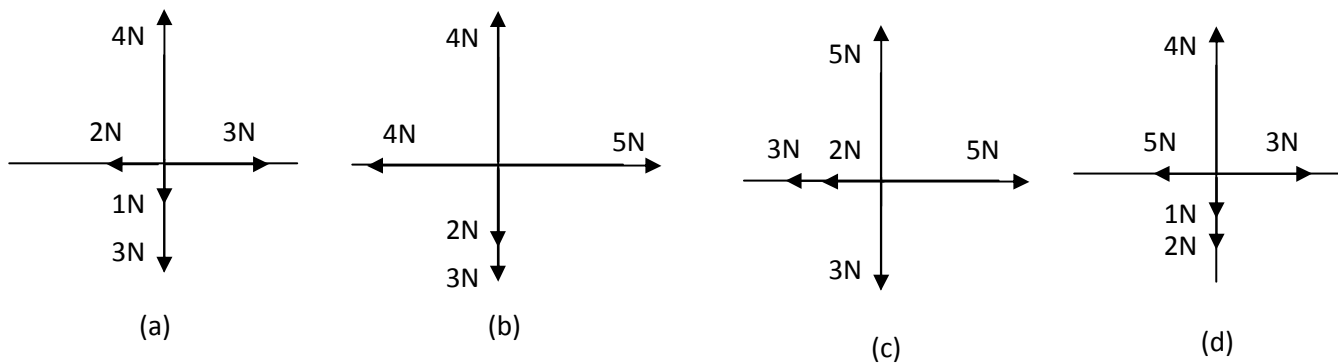
1. A Ball is thrown from ground level making an angle of  $30^\circ$  above the horizontal. The ball speed is 980 m/s. What is the of Range the projectile?  
a)  $4.3 \times 10^3$  m      b)  $8.5 \times 10^3$  m      c)  $43 \times 10^3$  m      d)  $84.8 \times 10^3$  m

2. Acceleration is defined as:  
a) Rate of change of position with time.  
b) Distance divided by time.  
c) Rate of change of velocity with time.  
d) A position of an object.

3. Which of the following is a scalar quantity?  
a) Speed      b) Velocity      c) Displacement      d) Acceleration

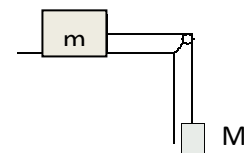
4. A force of 1N is:  
a) 1 kg/s      b) 1 kg · m/s      c) 1 kg · m/s<sup>2</sup>      d) 1 kg · m<sup>2</sup>/s

5. In which figure of the following the **Y- Component** of the net forces is Zero :

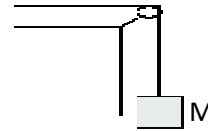


6. A block of mass  $m$  is connected to a block of mass  $M$  as shown , the normal force on block  $m$  is :


- a)  $F_N = mg - T$       b)  $F_N = Mg - T$   
c)  $F_N = mg$       d)  $F_N = Mg$

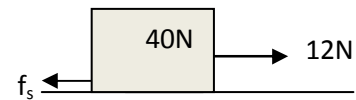


- [illegible]



8. The coefficient of static friction  $\mu_s = 0.4$  between a 5 kg block and horizontal surface. The maximum horizontal force that can be applied to the block before it slips is:
- a) 10 N                      b) 19.6 N                      c) 5.5 N                      d) 8.7 N

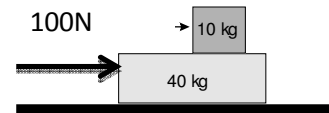
9. A 40-N box rests on a rough horizontal floor. A 12 N horizontal force is then applied to it but the box does not move. What is the magnitude of the frictional force on the box?
- a) 28N                      b) 52N  
c) 3.3N                      d) 12N
- 
- The diagram shows a light gray rectangular box with the text "40N" inside. To the right of the box is a horizontal arrow pointing to the right, representing an applied force.




10. The two physical quantities measured in the same units are;
- |                              |                     |
|------------------------------|---------------------|
| a) velocity and acceleration | b) weight and force |
| c) mass and weight           | d) force and mass   |

11. An 800 N person is standing in an elevator. If the normal force on the person is 600 N, the person is;
- a) at rest                      b) accelerating upward                      c) accelerating downward
- d) moving up at a constant speed

12. From the diagram; the acceleration of the two blocks is;
- a)  $1 \text{ m/s}^2$
- b)  $2 \text{ m/s}^2$
- c)  $30 \text{ m/s}^2$
- d)  $50 \text{ m/s}^2$



13. If the position of an object changes from  $\vec{r}_1 = -2\hat{i} + 3\hat{j}$  to  $\vec{r}_2 = \hat{i} - 2\hat{j}$ , the displacement is:  
 a)  $\Delta\vec{r} = 3\hat{i} + 5\hat{j}$       b)  $\Delta\vec{r} = -\hat{i} - 5\hat{j}$       c)  $\Delta\vec{r} = -3\hat{i} - 5\hat{j}$       d)  $\Delta\vec{r} = 3\hat{i} - 5\hat{j}$

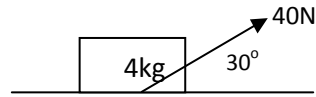
14. Two masses  $m_1=2$  kg,  $m_2= 4$  kg situated on a frictionless horizontal surface are connected by a string. A force  $F = 12$  N is exerted on  $m_2$  as shown in fig. The acceleration of the system is
- a)  $4 \text{ m/s}^2$                       b)  $3 \text{ m/s}^2$   
c)  $2 \text{ m/s}^2$                       d)  $1 \text{ m/s}^2$
- 
- The diagram shows two rectangular blocks, labeled  $m_1$  and  $m_2$ , on a horizontal surface. They are connected by a horizontal string. A force  $F$  is applied to the right side of block  $m_2$ , pulling it to the right. The surface is represented by a horizontal line with diagonal hatching underneath.



15. The position of a particle is given by  $\vec{r}(t) = 25t\hat{i} + 4t^2\hat{j}$ , the instantaneous **acceleration** at  $t = 1$  s is:
- a)  $(25\hat{i} + 8\hat{j}) \text{ m/s}^2$       b)  $(25\hat{i} + 8t\hat{j}) \text{ m/s}^2$       c)  $8\hat{j} \text{ m/s}^2$       d)  $2 \text{ m/s}^2$

16. A box, has mass of 4 kg, is pulled over a frictionless floor with a force of magnitude 40 N making an angle of  $30^\circ$  above the horizontal. The normal force is:

a) 39.2 N                                      b) 59.2 N  
c) 19.2 N                                      d) 40 N



17. If the net forces applied to a 5.0 kg box is 10 N, then the magnitude of the acceleration of the box is:

a)  $0.50 \text{ m/s}^2$                       b)  $2.0 \text{ m/s}^2$                       c)  $2.8 \text{ m/s}^2$                       d)  $10 \text{ m/s}^2$

18. The angle that gives the maximum range for a projectile is:

a)  $\theta=40^\circ$                       b)  $\theta=44^\circ$                       c)  $\theta=90^\circ$                       d)  $\theta=45^\circ$

19. A 400 N steel ball is suspended by a light rope from the ceiling. The tension in the rope is:

a) 400N                      b) 800N                      c) zero                      d) 200N

20. Which law says that force is equal to mass times acceleration ( $F=MA$ )?

a) Newton's first law of motion                      b) Newton's third law of motion  
c) Newton's second law of motion                      d) none

21. A particle's displacement is given by  $r_x = 4t^2 + 2$  and  $r_y = 2t^3$ . The velocity components are:

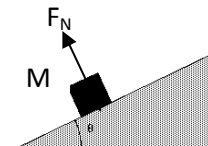
a)  $v_x = 8t$ ,  $v_y = 6t^2$                       b)  $v_x = -8t$ ,  $v_y = 6t$   
c)  $v_x = 8t + 2$ ,  $v_y = 6t^2$                       d)  $v_x = 4t$ ,  $v_y = 0$

22. As in Newton's second law, acceleration is always in the direction:

a) of the displacement                      b) of the final velocity  
c) of the initial velocity                      d) of the net force

23. From the diagram; the magnitude of the normal force  $F_N$  acting on the box

a)  $Mg$                                       b)  $Mg \cos\theta$   
c)  $Mg \sin\theta$                                       d)  $M g \tan\theta$



24. A car travels east at constant velocity. The net force on the car is;

a) east                      b) west                      c) up                      d) zero

25. The gravitational force of earth acting on a 1 kg is

a) 8.9N                      b) 9.8N                      c) 980N                      d) 1N

26. An 80 kg man stands on a scale in an elevator cab, if the cab accelerate upward with  $1.2 \text{ m/s}^2$ , the normal force ( $F_N$ ) is;

a) 80 N                      b) 880 N                      c) zero N                      d) 680 N

27. Two forces act on a particle that moves with constant velocity, one of the forces is  $\vec{F}_1 = 3\hat{i} - 5\hat{j}$  N, what is the other force?  
 a)  $\vec{F}_2 = 3\hat{i} - 5\hat{j}$       b)  $\vec{F}_2 = 5\hat{i} - 8\hat{j}$       c)  $\vec{F}_2 = -3\hat{i} + 5\hat{j}$       d)  $\vec{F}_2 = -5\hat{i} + 8\hat{j}$
28. A 10 N horizontal force pushes a block of weight 50 N to make it move with constant speed, the value of the coefficient of friction  $\mu_k$  is;  
 a) 0.2      b) 0.4      c) 0.5      d) 0.10
29. A man of mass 72 kg stands on a scale in an elevator cab. What does the scale read if the cab is not moving?  
 a) 21 N      b) 200 N      c) 705.6 N      d) 0
30. The y component of a vector  $\mathbf{A}$ ; ( $A_y$ ) is given by:  
 a)  $A \tan \theta$       b)  $A \sin \theta$       c)  $A \cos \theta$       d)  $A \cot \theta$
31. A ball in projectile motion at the highest point,  
 a)  $v_y = 0$ .      and       $v_x = \text{constant}$   
 b)  $v_y = \text{constant}$       and       $v_x = 0$   
 c)  $v_y = \text{constant}$       and       $v_x = \text{constant}$   
 d)  $v_y = 0$ .      and       $v_x = 0$
32. A girl weighs 489 N on Earth. Her mass is;  
 a) 489 kg      b) 9.8 kg      c) 0 kg      d) 50 kg
33. In Newton's third law the action and reaction forces are;  
 a) Both forces are equal and opposite in direction.  
 b) Both are in the same direction.  
 c) The action force is greater than the reaction force.  
 d) The reaction force is greater than the action force.