

$$F = 1 \times 10^{-5} \text{ kgms}^{-2} = 1 \text{ gcms}^{-2} \quad \text{But } 1 \text{ gcms}^{-2} = 1 \text{ dyne.}$$

Therefore $F = 1 \text{ dyne}$

PTS: 1

6. A body of mass 5kg moving at a velocity of 15m/s collides with a body of mass 12kg which is at rest. if the collision is inelastic, calculate the speed at which the bodies move off
- | | |
|-------------|------------|
| a. 6.24m/s | c. 4.41m/s |
| b. 12.05m/s | d. 2.18m/s |

ANS: C

PTS: 1

7. A 3kg pendulum bulb is released from rest at an angle of 60 degree from the vertical. What is the tension in the cord at the instant of release?
- | | |
|-----------|-----------|
| a. 7.36N | c. 22.10N |
| b. 14.72N | d. 25.49N |

ANS: B

$$T = mg \cos \theta$$

PTS: 1

8. An object is thrown straight up. How do we compare the net force on the object to its weight when it is at the highest point in the path?
- | | |
|----------------------------------------|------------------------------|
| a. It is greater than the weight | c. It is zero |
| b. It is slightly less than the weight | d. It is equal to the weight |

ANS: C

The object stops at the highest point

PTS: 1

9. A 600N object is to be given an acceleration of 0.07 m/s^2 . How large an unbalanced force must act upon it?
- | | |
|--------|--------|
| a. 57N | c. 43N |
| b. 45N | d. 20N |

ANS: C

$$F = mg$$

$$F = ma$$

PTS: 1

10. A load of 100kg is placed on an elevator of mass 700kg. Find the tension in the supporting cable when the elevator originally moving downward at 10 m/s is brought to rest with constant acceleration in 30m.
- | | |
|----------|----------|
| a. 9360N | c. 9540N |
| b. 9440N | d. 6640N |

ANS: D

Using

$$V^2 = u^2 + 2as$$

Since the elevator is moving downward mg

$$-T = ma$$

$$T = mg - ma$$

PTS: 1

11. A block of mass 8kg is pulled by a force of 50N along a frictionless floor by means of a chord which makes an angle 60° with the horizontal. Calculate the magnitude of the acceleration of the block.
- a. 3.125 m/s^2 c. 3.75 m/s^2
b. 6.25 m/s^2 d. 5.35 m/s^2

ANS: A

$$F=ma$$

since F is along the horizontal, resolving to it component,

$$F \cos \theta = ma$$

PTS: 1

12. A car of mass 540kg was accelerated along a flat road, from rest to 15 m/s in 7.5 seconds. What is the car's acceleration?
- a. 0.467 m/s^2
- b. 3.2 m/s^2
- c. 2 m/s^2
- d. 112.5 m/s^2

ANS: C

$$\mathbf{v} = \mathbf{u} + \mathbf{a}t$$

PTS: 1

13. A bullet of mass 0.2kg is fired with a velocity of 800m/s into a soft wood of mass 2kg, lying on a smooth surface. What is the final velocity if the collision is completely inelastic?
- a. 72.7m/s c. 80m/s
b. 8m/s d. 7.27m/s

ANS: A

In a completely inelastic collision, the colliding bodies move with the same velocity v after the collision.

Therefore: $m_1 U_1 + m_2 U_2 = (m_1 + m_2) V$

PTS: 1

14. After firing a cannon ball, the cannon moves in the opposite direction from the ball. This an example of?
- | | |
|------------------------|--------------------------------|
| a. Newton's First Law | c. Newton's Third Law |
| b. Newton's Second Law | d. Newton's Law of Gravitation |

ANS: C

equal and opposite reaction

PTS: 1

15. A 15kg mass is initially moving up a smooth incline at 10m/s. What would be the acceleration after it stops moving up to the incline, reverse direction and starts moving down the incline?
- 3.46 m/s^2
 - 6.94 m/s^2
 - 0.5 m/s^2
 - 8.67 m/s^2

ANS: B

$$a = g \sin \theta$$

PTS: 1

16. An object of mass 4.00kg is attached to the hook of a spiral-balance ,and the balance is suspended vertically from the roof of a lift . what's the reading on the spring balance when the lift is going up with an acceleration of 2m/s^2 ?

a. 20.0N

c. 45.0N

b. 18.9N

d. 48.0N

ANS: D

$$F = Ma$$

PTS: 1

17. A 5kg block rests on an incline with a coefficient of static friction of 0.30. What is the minimum angle at which the block will begin to slide?

a. 15.7°

c. 23°

b. 16.7°

d. 32.3°

ANS: B

$$\mathbf{fg} = \mathbf{fs}$$

$$mg \sin \theta = U_s mg \cos \theta$$

PTS: 1

18. What horizontal force is required to hold a 3kg book vertically against a wall to prevent it from falling if the coefficient of static friction between the book and wall is 0.30?

a. 58N

c. 98N

b. 9.8N

d. 5.8N

ANS: C

$$F_y = F_s - W = 0.$$

$$F_s = W.$$

$$U_{sFN} = mg$$

$$E_f x = F - FN$$

$$\mathbf{FN} = \mathbf{F}$$

$$US(F) = mg$$

PTS: 1

19. A box that weighs 25 N is pulled by an applied force of 10 N. The coefficient of static friction between the box and the surface is 0.5. The box will:

a. start moving and will continue to increase its velocity c. start moving and continue to increase its acceleration

- c. start moving
acceleration

- b. start moving and maintain a constant velocity

d. not move

ANS: D

PTS: 1

20. A 25 N box is pulled across a rough surface by an applied force of 22 N. The coefficient of kinetic friction between the box and the surface is 0.3. Find the acceleration of the box. (Use $g = 10 \text{ m/s}^2$)

a. $2.9m/s^2$

c. $5.8m/s^2$

b. $4.8m/s^2$

d. $8.8m/s^2$

ANS: C

PTS: 1