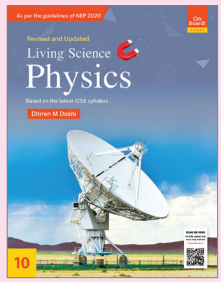
ICSE Living Science PHYSICS

Class 10

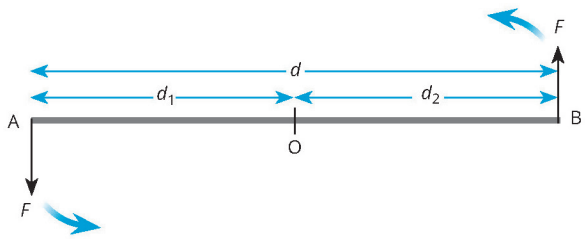


Multiple-Choice Questions

Chapter 1: TURNING FORCES

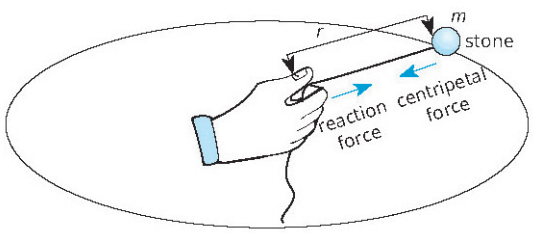
1. Which one of the following statements about the moment of a force or torque is correct?
   (a) The moment of a force or torque about a given axis is dependent only on the magnitude of the force applied.
   (b) It is dependent only on the perpendicular distance from the axis of rotation to the line of action of force.
   (c) It is dependent neither on the force nor on the perpendicular distance of the force from the axis.
   (d) Torque or moment of force is the measure of the capacity of a force to turn a body.
   Ans: (d)

2. Methods to find moment of a couple are given below. Choose an option which has the correct methods to find the moment of couple.



   (i) $F \times d_1$
   (ii) $F \times d_2$
   (iii) $F \times d_1 + F \times d_2 = F \times (d_1 + d_2)$
   (iv) $F \times d$
   (a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)
   Ans: (c)

3. Looking at the picture, choose the correct options that describe the forces acting on the stone.



   (i) Centripetal and centrifugal forces acting on the stone make it move in a circular path.
   (ii) The centripetal force is directed inward towards the centre which is balanced by the centrifugal force acting outward away from the centre.
   (iii) Both centripetal and centrifugal forces are real.

(iv) The centripetal force is real whereas the centrifugal force is fictitious.

(v) The centripetal force is associated with an external agent whereas the centrifugal force is associated with an internal agent.

(a) (i), (ii) and (iii) (b) (ii), (iii) and (iv) (c) (iii), (iv) and (v) (d) (i), (ii) and (iv)

Ans: (d)

4. The appliance which works on the principle of moment is

(a) spring balance. (b) beam balance. (c) pendulum clock. (d) balance wheel.

Ans: (b)

5. The turning effect produced in a rigid body around a fixed point by the application of force is called

(a) turning force. (b) moment of force. (c) moment of couple. (d) none of these.

Ans: (b)

6. The condition for equilibrium is

(a) the resultant of all the forces acting on the body be zero only.

(b) the resultant of moments of all the forces acting on the body about the turning point should be zero.

(c) both (a) and (b).

(d) neither (a) nor (b).

Ans: (c)

7. Choose the correct option.

(A) For the scale to be in rotational equilibrium,

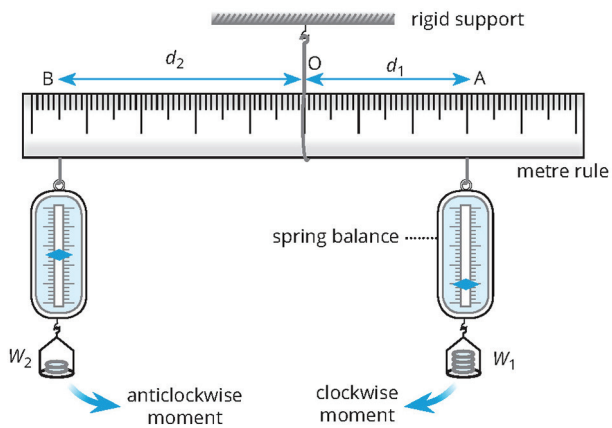
(a) $W_1 \times d_1 = W_2 \times d_2$

(b) $W_1 \times d_1 > W_2 \times d_2$

(c) $W_1 \times d_1 < W_2 \times d_2$

(d) None of these

Ans: (a)



(B) If the arm lengths of the alongside scale are 45 cm and 30 cm respectively then what weight (W_1) should be kept on the second physical balance to balance the weight of 100 gf kept on the first?

(a) 50 gf (b) 100 gf (c) 150 gf (d) 200 gf

Ans: (c)

[Hint: 100 gf × 45 cm = W_1 × 30 cm

W_1 = (100 gf × 45 cm)/30 cm = 150 gf]

8. The centre of gravity of a cricket ball is at

(a) its geometrical centre. (b) at its bottom touching the ground.

(c) its topmost point. (d) at any point on its surface.

Ans: (a)

9. What is the relation between Nm and dyne cm?

(a) 1 Nm = 100 dyne cm (b) 1 Nm = 10^5 dyne cm

(c) 1 Nm = 10^7 dyne cm (d) 1 Nm = 10^3 dyne cm

Ans: (c)

10. The earth revolving around the sun is in _____ equilibrium.

(a) static (b) dynamic (c) gravitational (d) centripetal

Ans: (b)

11. A steering wheel of diameter 1.5 m is rotated anti-clockwise by applying two forces each of magnitude 10 N. The moment of forces applied on it is

(a) 10 Nm (b) 12 Nm (c) 15 Nm (d) 18 Nm

Ans: (c)

[Hint: Moment of force = Force × Moment arm = 10 N × 1.5 m = 15 Nm]

12. In a uniform circular motion

(a) speed of the body continuously changes.

(b) the velocity of the body continuously changes because direction of motion changes.

(c) the motion of a body accelerated.

(d) both (b) nor (c).

Ans: (d)

13. Which of the following quantities is constant for a body in uniform circular motion?

(a) Velocity (b) Speed (c) Acceleration (d) Momentum

Ans: (b)

14. A force of 500 N produces a momentum of force of 400 Nm. What is the shortest distance between the point of application of force and turning point?

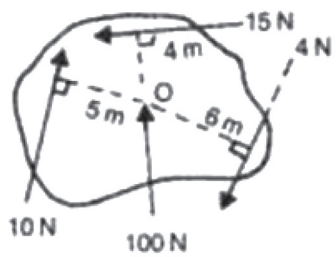
(a) 10 m (b) 1.2 m (c) 0.8 m (d) 1.8 m

Ans: (c)

[Hint: Moment of force = Force × Perpendicular distance

Perpendicular distance = Moment of forces/Force = 400/500 = 0.8 m]

15. The resultant moment of force about O and its direction is



(a) 10 Nm clockwise. (b) 12 Nm anticlockwise.

(c) 14 Nm clockwise. (d) 16 Nm anticlockwise.

Ans: (c)

16. The centre of gravity of a cylindrical body is

(a) at the geometrical centre. (b) at its bottom.

(c) at the mid-point on its axis. (d) outside the body.

Ans: (c)

17. A body is acted upon by two unequal forces in opposite direction, but not in one line. The effect is that

(a) the body will have only the rotational motion.

(b) the body will have only the translational motion.

(c) the body will have rotational as well as translational motion.

(d) the body will have neither rotational nor translational motion.

Ans: (c)

18. In order to rotate a bar pivoted at its mid-point, we need to apply
    (a) a large force on any point on the bar.
    (b) a small force exactly at the mid-point where it is pivoted.
    (c) two unequal forces at the two ends but in the same direction.
    (d) two unequal forces at the two ends but in the opposite direction.
    Ans: (d)

19. The moment of couple can be defined mathematically as the
    (a) product of one force and the perpendicular distance between the two forces.
    (b) product of two forces and the perpendicular distance between them.
    (c) product of one force and perpendicular distance between the point of application of force and turning force.
    (d) none of the above.
    Ans: (a)

20. Steering the wheel of a motor car is an example of
    (a) translational motion.
    (b) rotational motion.
    (c) linear motion.
    (d) circular motion.
    Ans: (b)