CBSE

FORCE AND LAWS OF MOTIONS WS 3

Class 09 - Science

Section A

1. Water drops sticking to the wheel come out along the tangential line due to **[1]**

   a) inertia
   b) acceleration
   c) momentum
   d) force

2. Which of the following has the largest inertia? **[1]**

   a) your physics book
   b) a pin
   c) your school bag
   d) a pen

3. A plate, a ball and child all have the same mass. The one having more inertia is the **[1]**

   a) child
   b) plate
   c) All have equal inertia
   d) ball

4. A motorcycle and a car are moving on a horizontal road with the same velocity. If they are brought to rest by the application of brakes, which provided equal retardation, then **[1]**

   a) Both will stop at the same distance
   b) Car will stop at a shorter distance
   c) Nothing can be predicted.
   d) Motorcycle will stop at shorter distance

5. A passenger in a moving train tosses a coin which falls behind him. It means that motion of the train is **[1]**

   a) along circular tracks
   b) uniform
   c) accelerated
   d) retarded

6. The one which has the least inertia among the following: 1 kg stone, 2 kg ball, a train compartment and a cup of tea is **[1]**

   a) 2 kg ball
   b) 1 kg stone
   c) a train compartment
   d) a cup of tea

7. The inertia of an object tends to cause the object **[1]**

   a) to decelerate due to friction
   b) to increase its speed
   c) to resists any change in its state of motion
   d) to decrease its speed

8. Impulse has the S.I. unit of _____ **[1]**

   a) newton
   b) N-s
   c) joule
   d) m/s^2

9. A mass M breaks into two pieces in the ratio 1 : 3 while at rest. If the heavier has a speed of v, the speed of the lighter is **[1]**

a) 3v
b) v
c) 4v
d) 2v

10. A water tanker filled up to $\frac{2}{3}$rd of its height is moving with a uniform speed. On sudden application of the brake, the water in the tank would **[1]**

a) be unaffected
b) move backwards
c) rise upwards
d) move forwards

11. Bags at the top of school van are tied using a string to avoid the effect of **[1]**

a) inertia
b) acceleration
c) force
d) momentum

12. **Assertion (A):** Inertia is that property of the body due to which it resists a change in its state of rest or of uniform motion. **[1]**
Reason (R): Heavy objects have less inertia than lighter objects.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

13. **Assertion (A):** If we kick a football it will move a long way. **[1]**
Reason (R): The inertia of an object is measured by its mass.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

14. **Assertion (A):** Mass is a measure of inertia of the body in linear motion. **[1]**
Reason (R): Greater the mass, greater is the force required to change its state of rest or motion.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

15. Inertia is of _____ types. **[1]**

a) three
b) four
c) two
d) one

16. A high jumper runs for a while before taking high jump so that the inertia of _____ help him in taking a long jump. **[1]**

a) shape
b) direction
c) rest
d) motion

17. Leaves get detached from a tree due to _____. **[1]**

a) conservation of momentum
b) change in momentum
c) acceleration
d) inertia

18. **Statement A:** Rocket contains fuel as well as oxygen to burn its fuel in its body. **[1]**
Statement B: A jet plane takes oxygen from the atmosphere to burn its fuel.

Which statement is true?

a) Statement A is true
b) Statement B is false
c) Both statement A and B are true
d) Neither statement A nor statement B is true

19. Body A is heavier than body Q. Which has more inertia? **[1]**

20. Why mass is sometimes called coefficient of linear inertia? **[1]**

21. Define electrostatic force. **[1]**

22. Why does a mug full of water feel lighter inside water? **[1]**

Section B

23. **State True or False:** **[2]**
    (a) Heavy objects have lighter inertia than lighter objects. **[1]**
    (b) All objects resist a change in their state of motion. **[1]**

24. Explain why some of the leaves may get detached from a tree if we vigorously shake its branch. **[2]**

25. In the oil tankers some space is left at the top while filling them. Explain. **[2]**

26. Explain why some of the leaves may get detached from a tree if we vigorously shake the branch of the tree. **[2]**

27. Two balls of the same size of different materials, rubber and iron are kept on the smooth floow of a moving train. The brakes are applied suddenly to stop the train. Will the balls start rolling ? If so, in which direction? Will they move with the same speed? Give reasons for yours answer. **[2]**

28. Which of the following has more inertia: **[2]**
    a. a rubber ball and a stone of the same size?
    b. a bicycle and a train?
    c. a five rupees coin and a one-rupee coin?

29. Why do you fall in the forward direction when a moving bus brakes to a stop and fall backward when it accelerates from rest? **[2]**

30. In the following example, try to identify the number of times the velocity of the ball changes: **[2]**
    “A football player kicks a football to another player of his team who kicks the football towards the goal. The goalkeeper of the opposite team collects the football and kicks it towards a player of his own team”.
    Also identify the agent supplying the force in each case.

31. Why do you fall in the forward direction when a moving bus brakes to a stop and fall backwards when it accelerates from rest? **[2]**

32. Explain, why is it difficult for a fireman to hold a hose, which ejects large amounts of water at a high speed. **[2]**

33. When a carpet is beaten with a stick, dust comes out of it. Explain. **[2]**

34. Which of the following has more inertia: **[2]**
    a. a rubber ball and a stone of the same size?
    b. a bicycle and a train?
    c. a five-rupee coin and a one-rupee coin?

35. Describe in brief an activity to illustrate the property of inertia of rest. **[2]**

36. On what factors do the following physical quantities depend? **[2]**
    i. Inertia
    ii. Momentum
    iii. Force

37. There are three solids balls made up of aluminium, steel and wood, of the same shape and same volume. Which **[2]**

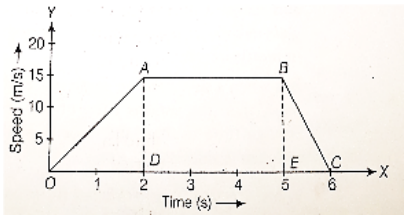
of them would have highest inertia?

Section C

38. The speed-time graph of a car is given. The car weighs 1000 kg. **[3]**

i. What is the distance travelled by car in the first 2s?

ii. What is the braking force applied at the end of 5 s to bring the car to stop within one second?



Section D

39. **Fill in the blanks:** **[4]**

(a) Mass is a measure of _____ of a body. **[1]**

(b) The tendency of undisturbed objects to stay at rest or to keep moving with the same velocity is called _____. **[1]**

(c) The SI unit of mass is _____. **[1]**

(d) _____ is that property of the body due to which it resists a change in its state of rest or of uniform motion. **[1]**