

CLASS 9 SCIENCE

CHAPTER 6 • HOW FORCES AFFECT MOTION

MCQs • Multiple-Choice Practice

1. A force can cause an object to:

- A. Change its motion
- B. Change its shape
- C. Change its speed or direction
- D. All of these

2. The SI unit of force is:

- A. Joule
- B. Newton
- C. Watt
- D. Pascal

3. A force is a quantity that has:

- A. Only magnitude
- B. Magnitude and direction
- C. Only direction
- D. Neither magnitude nor direction

4. When forces acting on an object are equal and opposite, the net force is:

- A. Maximum
- B. Zero
- C. Negative always
- D. Infinite

5. The force that opposes relative motion between surfaces in contact is:

- A. Gravitational force
- B. Friction
- C. Magnetic force
- D. Electrostatic force

6. Friction generally acts:

- A. In the direction of relative motion
- B. Opposite to relative motion
- C. Only upward
- D. Only downward

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7. Which factor can affect the force of friction between surfaces?

- A. Nature of the surfaces
- B. Colour of the surfaces
- C. Shape of the Earth
- D. Time of day

9. Newton's first law is also associated with the concept of:

- A. Energy
- B. Inertia
- C. Power
- D. Pressure

11. Newton's first law states that an object at rest remains at rest unless:

- A. Its mass changes
- B. A net force acts on it
- C. Time stops
- D. Friction becomes zero only

8. If the net force on an object is zero, its acceleration is:

- A. Zero
- B. Always 1 m/s^2
- C. Maximum
- D. Negative

10. Inertia is the tendency of an object to:

- A. Change its state automatically
- B. Resist a change in its state of rest or uniform motion
- C. Increase its mass
- D. Produce energy

12. An object moving with constant velocity has:

- A. Non-zero acceleration
- B. Zero acceleration
- C. Increasing mass
- D. Increasing force necessarily

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13. If no net force acts on a moving object, it will:

- A. Stop immediately
- B. Continue with constant velocity
- C. Always accelerate
- D. Move in a circle

15. The mathematical form of Newton's second law is:

- A. $F = ma$
- B. $P = W/t$
- C. $W = Fs$
- D. $v = u + at$

17. For the same force, if the mass of an object is doubled, its acceleration:

- A. Doubles
- B. Is halved
- C. Becomes four times
- D. Remains unchanged

14. Newton's second law states that acceleration is:

- A. Directly proportional to net force and inversely proportional to mass
- B. Directly proportional to mass only
- C. Independent of force
- D. Always zero

16. If the net force on a fixed-mass object is doubled, its acceleration:

- A. Is halved
- B. Doubles
- C. Becomes zero
- D. Remains unchanged

18. Momentum is defined as:

- A. Mass $\times$ velocity
- B. Mass $\times$ acceleration
- C. Force $\times$ distance
- D. Force $\div$ time

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19. The direction of momentum is the same as the direction of:

- A. Acceleration
- B. Velocity
- C. Friction
- D. Weight

20. The SI unit of momentum is:

- A. kg m/s
- B. N/m
- C. J/s
- D. kg/m

21. A force of 1 N is approximately the force needed to support a mass of:

- A. 10 kg
- B. 1 kg
- C. 100 g
- D. 1 g

22. The acceleration due to gravitational force by Earth does not depend on the:

- A. Mass of the object
- B. Direction of motion
- C. Position of the Earth
- D. Presence of air only

23. Newton's third law states that forces between two interacting objects are:

- A. Equal and opposite
- B. Equal and in the same direction
- C. Unequal and opposite
- D. Always zero

24. According to Newton's third law, action and reaction forces act on:

- A. The same object
- B. Two different objects
- C. No objects
- D. Only stationary objects

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25. When a canoeist pushes water backwards, the water pushes the canoeist and canoe:

- A. Backwards
- B. Forwards
- C. Downwards only
- D. With no force

27. Two connected boxes pulled together can be treated as:

- A. A single system for finding acceleration
- B. Two unrelated objects only
- C. A stationary object always
- D. A closed chemical system

29. The slope of a velocity-time graph represents:

- A. Force
- B. Acceleration
- C. Mass
- D. Momentum

26. A person can walk forward because the foot pushes the ground:

- A. Forward, and ground pushes foot backward
- B. Backward, and ground pushes foot forward
- C. Upward only
- D. With zero force

28. For a system of connected objects, internal forces:

- A. Must always be added to the external force
- B. Can cancel within the system when considering the whole system
- C. Are always larger than external forces
- D. Never exist

30. When an object is at rest, its velocity-time graph is:

- A. A horizontal line at zero velocity
- B. A vertical line
- C. A curved line always
- D. A line with increasing velocity

ANSWER KEY

Chapter 6 • How Forces Affect Motion

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	D	2	B	3	B	4	B	5	B
6	B	7	A	8	A	9	B	10	B
11	B	12	B	13	B	14	A	15	A
16	B	17	B	18	A	19	B	20	A
21	C	22	A	23	A	24	B	25	B
26	B	27	A	28	B	29	B	30	A

Quick Revision: Force • Friction • Balanced & unbalanced forces • Inertia • Newton's three laws • $F = ma$ • Momentum • Action–reaction pairs • Systems of objects • Motion graphs