



1. Write true or false for each statement

(a) Two trains going in opposite directions with the same speed are at rest relative to each other.

Answer. False.

(b) A ball is thrown vertically upwards. Its motion is uniform throughout.

Answer. False.

(c) The motion of a train starting from one station and reaching at another station is non-uniform.

Answer. True.

(d) A motion which repeats itself after a fixed interval of time is called periodic motion.

Answer. True.

(e) A ball thrown by a boy from a roof-top has oscillatory motion.

Answer. False.

(f) Mass has both magnitude and direction.

Answer. False.

(g) Weight always acts vertically downwards.

Answer. True

(h) Mass varies from place to place but weight does not.

Answer. False

2. Fill in the blanks

(a) Two boys cycling on the road with the same speed are **at rest** relative to each other.

(b) The motion in a **straight line** is rectilinear motion.

(c) One to and fro motion of a clock pendulum takes time = **2 s**

(d) $36 \text{ km h}^{-1} = 10 \text{ m s}^{-1}$

(e) Total distance travelled = **average speed** \times total time taken.

(f) The weight of a girl is 36 kgf. Her mass will be **36 kg**.

(g) The weight of a body is measured using a **spring balance**.

Examples of motion	Type/types of motion
Soldiers in a march past on a straight road
The movement of our chest while breathing
Hands of an athlete in a race
Pedal of a bicycle in motion
Motion of earth around the sun
Motion of a swing
Motion of a pendulum
A stone falling from a certain height
A plucked string of a sitar
A car moving on a straight
Motion of a train on a straight bridge
Motion of a spinning wheel
The movement of the wheel of a bicycle

Ans.

Examples of motion	Type/types of motion
Soldiers in a march past on a straight road	Rectilinear
The movement of our chest while breathing	Vibratory
Motion of a swing	Oscillatory
Motion of a pendulum	Oscillatory
A stone falling from a certain height	Rectilinear
A plucked string of a sitar	Vibratory
A car moving on a straight	Circular
Motion of a train on a straight bridge	Curvilinear
Motion of a spinning wheel	Rotatory
The movement of the wheel of a bicycle	Translatory
Hands of an athlete in a race	Oscillatory
Pedal of a bicycle in motion	Circular
Motion of earth around the sun	Circular

B. Short/Long Answer Questions

Question 1.

Explain the meaning of the terms rest and motion.

Answer:

Rest— A body is said to be at rest if it does not change its position with respect to its immediate surroundings.

Motion— A body is said to be in motion if it changes its position with respect to its immediate surroundings.

Question 2.

Comment on the statement 'rest and motion are relative terms'. Give an example.

Answer:

Imagine you are sitting inside a moving bus. When you look outside you will observe that you are moving.

Now look to the roof of the bus. With respect to the roof of bus, you are at rest. Hence it is concluded that rest and motion are relative terms.

Question 3.

Fill in the blanks using one of the words : at rest, in motion.

(a) A person walking in a compartment of a stationary train is relative to the compartment and is relative to the platform.

(b) A person sitting in a compartment of a moving train is relative to the other person sitting by his side and is relative to the platform.

Answer:

(a) A person walking in a compartment of a stationary train is in motion relative to the compartment and is in motion relative to the platform.

(b) A person sitting in a compartment of a moving train is at rest . relative to the other person sitting by his side and is in motion relative to the platform.

Question 4.

Name five different types of motion you know.

Answer:

The different types of motion are :

1. Translatory motion
2. Rotatory motion
3. Oscillatory motion
4. Vibratory motion
5. Periodic motion
6. Multiple motion
7. Random motion.

Question 5.

What do you mean by translatory motion ? Give one example.

Answer:

If an object like a vehicle, moves in a line in such a way that every point of the object moves through the same distance in the same time, then the motion of the object is called translatory motion.

Example :

The motion of an apple falling from a tree, the motion of a man walking on a road, the motion of a box when pushed from one corner of a room to the other, are all the translatory motion.

Question 6.

Explain the meanings of (i) rectilinear motion, and (ii) curvilinear motion. Give one example of each.

Answer:

(i) Rectilinear motion – If the motion of a body is along a straight line, it is said to be the rectilinear or linear motion. The motion of bullet fired from a gun.

(ii) Curvilinear motion – If the motion of a body is along a curved path, it is said to be the curvilinear motion. For example, the motion of a cycle while taking a turn on the road, a car moving along a curved path, a ball thrown by an athlete are in curvilinear motion.

Question 7.

What is rotatory motion ? Give two examples.

Answer:

Rotatory motion— A body is said to be in a rotatory motion or a circular motion if it moves about a fixed axis without changing the radius of its motion.

Examples : The blades of a fan, a spinning wheel.

Question 8.

What is meant by circular motion ? Give one example.

Answer:

The motion of a body along a circular path is called circular motion.

Example : A girl is whirling a stone tied at the end of a string in a circular path.

Question 9.

How does a rotatory motion differ from the circular motion?

Answer:

(i) In rotatory motion, the axis of rotation passes from a point in the body itself whereas in circular motion, the axis of revolution passes through a point outside the body. Thus the motion of earth around the sun is the circular motion whereas the motion of earth about its own axis is the rotational motion.

(ii) In the circular and rotatory motions, the distance of a point of a the body from a fixed point always remains same, whereas it is not same in curvilinear motion.

Question 10.

Explain oscillatory motion by giving one example.

Answer:

Oscillatory motion— The to and fro motion of a simple pendulum is an oscillatory motion.

Example : 1. The motion of a swing, 2. Piston of an engine.

Question 11.

What is vibratory motion ? Give one example.

Answer:

In vibratory motion, a part of the body always remains fixed and the rest part moves to and fro about its mean position. During the vibratory motion, the shape and size of the body changes. Example : When we breath, our chest expands and contracts. This motion is vibratory motion.

Question 12.

Differentiate between periodic and non-periodic motions by giving an example of each.

Answer:

Periodic motion : A motion which gets repeated after regular intervals of time is called a periodic motion.

Examples : The earth moving around the sun takes 365 days to complete one revolution and this motion gets repeated after every 365 days.

Non-periodic motion : The motion which does not repeat itself after regular interval of time is called non-periodic motion.

Examples : A footballer running on a field, application of brakes in a moving vehicle, a ball rolling down the ground gradually slows down and finally stops, motion of tides in the sea, etc.

Question 13.

What is random motion. Give one example.

Answer:

Random motion— When an object in a motion has no specific path and which suddenly changes its motion is said to have a random motion.

Example : A flying kite.

Question 14.

Name the type/types of motion being performed by each of the following:

- (a) Vehicle on a straight road
- (b) Blades of an electric fan in motion
- (c) Pendulum of a wall clock
- (d) Smoke particles from chimney
- (e) Hands of a clock
- (f) Earth around the sun
- (g) A spinning top.

Answer:

- (a) Rectilinear motion
- (b) Rotatory motion
- (c) Oscillatory motion, periodic motion
- (d) Non-periodic motion
- (e) Uniform circular and periodic motion
- (f) Rotatory motion, circular motion and periodic motion
- (g) Rotatory motion