

## Chapter 04

### Motion and Time

#### Textbook Exercises:

1. State whether the following statements are True or False. Rewrite the wrong statements correctly.
  - a) A body can be at rest and in motion at the same time in relation to the same set of surroundings.
  - b) A passenger flying in an airplane is at rest with respect to the airport and moving with respect to other passengers.
  - c) The wheels of a train are in rotatory motion as well as in translatory motion, when it moves.

Ans.

- a) False

A body in motion with respect to a set of objects can appear at state of rest with respect to another set of objects at the same time.

- b) False

A passenger flying in an airplane is at rest with respect to the other passengers and moving with respect to the airport.

- c) True

The wheels of a train are in rotatory motion as well as in translatory motion, when it moves.

2. John tied a stone to a string and whirled it around. What type of motion do you find there?

Ans.

Tied stone moves in rotatory motion. It spins in a circular motion.

3. What is common to the following?

Motion of the propeller of a flying helicopter, the minute hand of a watch, the tape of a cassette recorder.

- a) All are examples of translatory motion
- b) All are examples of oscillatory motion
- c) All are examples of rotatory motion
- d) All are examples of periodic motion

Ans.

The motion of the propeller of a flying helicopter, the minute hand of a watch and the tape of a cassette recorder are examples of rotatory motion.

4. Which of the following is not an oscillatory motion?

- a) Motion of the hammer of an electric bell
- b) Motion of your hands while running
- c) Motion of a child on a see saw
- d) Motion of a horse pulling a cart

Ans.

d) Motion of a horse pulling a cart is not an oscillatory motion.

5. Arun completed a 100 meter race in 16s, while Karthik finished in 13s. Who ran faster?

Ans.

Karthik ran faster than Arun. Karthik took short time to cover the same distance compared to Arun.

6.

I) A train runs from New Delhi to Hyderabad. It covers first distance of 420 km in 7 hrs and next distance of 360 km in 6 hrs.

II) Gopi takes part in a car race. He drives a distance of 70 km each in the first, second and third hours.

Which of the following statements is true?

a) I is an example uniform motion and II is an example of non-uniform motion.

b) I is an example of non-uniform motion and II is an example of uniform motion.

c) I and II are examples of uniform motion.

d) I and II are examples of non-uniform motion.

Ans.

b) I is an example of non-uniform motion and II is an example of uniform motion.

7. Write the motion of different parts of a bicycle while it is in motion.

a) The wheel

b) The cycle chain

c) The pedal with its arm

d) The movement of the feet pedaling

e) The movement of the rider along with the bicycle

Ans.

a) The wheel – rotatory motion

b) The cycle chain – rotatory motion

- c) The pedal with its arm – rotatory motion
- d) The movement of the feet pedaling – rotatory motion
- e) The movement of the rider along with the bicycle – linear motion

8. Which of the following statements are correct?

- a) The basic unit of time is second.
- b) Every object's motion is uniform.
- c) Two cars move for 5 minutes and 2 minutes respectively. The second car is faster because it takes less time.
- d) The speed of a car expressed in km/h

Ans. a) The basic unit of time is second.

9. The basic unit of speed in SI system is

- a) km / min
- b) m/min
- c) km/h
- d) m/s

Ans. d) m/s

10. The correct relation between speed, distance and time is.

- a) Speed = distance x time
- b) Speed = time / distance
- c) Speed = distance / time
- d) Distance = speed / time

Ans. c) Speed = distance/time

11. The distance between two stations is 240 km. A train takes 4 hrs to cover this distance. Calculate the speed of the train.

Ans.

The speed calculated by using the formula,

Speed = distance/time

Distance is 240km and time taken is 4 hrs.

$$S = 240\text{km}/4\text{hr}$$

$$S = 60 \text{ km/hr}$$

Therefore, the speed of the train is 60km/hr.

**12.** A train travels at a speed of 180 km/h. How far will it travel in 4 hours?

**Ans.** Speed of the train = 180 km/h

Time taken = 4hrs

Distance = Speed x Time

$$D = 180\text{km/h} \times 4\text{h}$$

$$D = 720 \text{ km}$$

Therefore, the train travels 720 km in 4 hours.

**13.** When do you say an object, is in rotatory motion

**Ans.**

When every point on a moving object moves around a centre or axis of rotation, it said to be in rotatory motion.

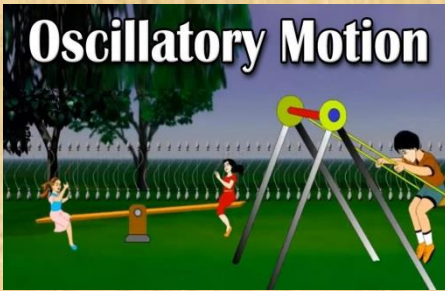
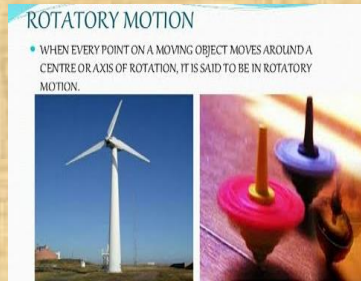
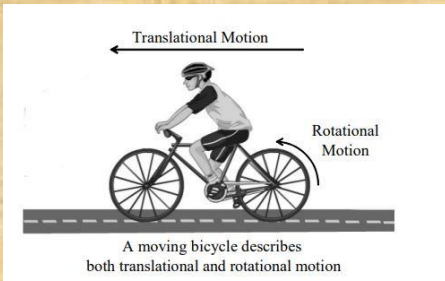
**Ex:** Motion of a windmill

**14.** Can an object possess translatory and rotatory motion at the same time? Give an example.

**Ans.**

Yes, an object can possess translatory and rotatory motion at the same time. For example, wheels of a moving train possess both translatory and rotatory motion at the same time.

**15.** Make a collection of action pictures showing living and non-living things in motion. Paste them neatly in a scrapbook. Under each picture, write the type of motion the picture shows.



16. In a sewing machine used by tailors, mention the type of motion of sewing machines parts when it runs.

- a) The wheel      b) The needle    c) The cloth.

Ans.

In a sewing machine used by tailors, the type of motion exhibited:

- a) The wheel – Rotational motion  
 b) The needle – Oscillatory motion  
 c) The cloth – Translatory motion