Chapter 9 - Motion and Types of Motion

Question 1:

Identify the types of motion.

(a) Movement of the earth around the sun: Circular and periodic motion.
(b) Movement of a ceiling fan: Circular motion.
(c) A meteor falling from the sky: Linear motion.
(d) A rocket launched from the ground: Linear motion.
(e) A fish swimming in water: Random motion.
(f) The plucked string of a sitar: Oscillatory motion

Question 2:

Fill in the blanks:

(Linear, non-linear, circular, uniform linear, non-uniform linear, uniform circular, non-uniform circular, random)

(1) If a ball is released from a terrace of a building, it comes down in uniform linear motion. On the other hand, it reaches the ground in random motion, if it is thrown with force away from the terrace in a direction parallel to the terrace.
(2) The motion of an aeroplane on the runway before take-off is linear.
(3) The kite looking for its prey flies with circular motion in the sky.
(4) Children sitting in a rotating giant wheel have uniform circular motion, while those sitting in a merry-go-round have a non-uniform circular motion.

Question 3:

How are we different?

(1) Oscillatory motion and linear motion:

Ans.

Oscillatory motion	Linear motion
(1) Oscillatory motion is a type of non- linear motion. The objects in this type of motion never move in a straight line.	(1) Objects showing linear motion always move in a straight line.
(2) The object showing oscillatory motion comes back to its original place again and again.	(2) The object showing linear motion is displaced away from the original place.

(3) e.g. the table fan and ceiling fan, merry-go-round and giant wheel, the pendulum of a clock.	(3) e.g. Running vehicles, Parade of soldiers.

(2) Linear motion and random motion:

Ans.

Linear motion	Random motion
(1) In linear motion, the object travels in a straight line and in the same direction.	(1) In random motion, the object travels in any direction and with continuously changing speed.
(2) Objects displaying linear motion always travel in a straight line.	(2) Objects displaying random motion never travel in one straight line.
(3) e.g. Moving train, parading soldiers.	(3) e.g. Flying birds, swimming fish.

(3) Random motion and oscillatory motion:

Ans.

Random motion	Oscillatory motion
(1) The motion that changes its direction and speed continuously is called random motion.	(1) The motion in which an object goes one direction and comes back again to the original position is called oscillatory motion.
(2) The random motion is a non-linear motion and does not have a fixed direction.	(2) Oscillatory motion is non-linear motion and has a fixed direction.
(3) The objects showing random motion, may not come back to the original position.	(3) The objects showing oscillatory motion come back to the original position.
(4) e.g. Flying butterflies and bird, game of football.	(4) e.g. Pendulum of a clock, needle of sewing machine, table fan and ceiling fan.

Question 4:

Explain in your own words, giving one example each:

(1) Linear motion.

Ans. The motion of an object travelling in a straight line or in the same direction is called linear motion. For example: The motion of a moving car on a straight road.

(2) Oscillatory motion.

Ans. The motion of a body that is moving in back-and-forth direction is called oscillatory motion. e.g., the swinging pendulum of a clock, the needle of a sewing machine and vibrating diaphragm of different musical instruments.

(3) Circular motion.

Ans. The motion of an object along a circular path is called circular motion. e.g., The movement of the blades of a fan.

(4) Random motion.

Ans. The motion that changes its speed and direction continuously is called random motion. e.g., The butterflies, birds flying in the sky, the wandering animals, the swimming fish, etc.

(5) Periodic motion.

Ans. The motion in which moving object passes through a certain point again and again after a fixed period is called periodic motion. e.g., The hands of the clock.

Question 5:

Answer the following questions in your own words:

(1) Which types of motion are seen in birds flying in the sky?

Ans. The birds flying in the sky show oscillatory motion when they flap their wings. Most of the birds show linear motion. Some like kite display circular motion. Crows are seen moving in random motion.

(2) Write in detail about your experience of various types of motion while riding a bicycle on a road.

Ans. When we start a bicycle, we have to pedal it. This is circular motion in which pedals of the bicycle move. Then we decide the direction and usually pick up a linear motion. For doing so we can turn the handle of the bicycle. The wheels of a bicycle turn in circular motion. If we go with the same speed in one direction it will be uniform linear motion. If we increase and decrease the speed intermittently, it will be non-uniform linear motion. Sometimes, just for fun, we may take round turns, the motion then becomes oscillatory and circular too.

Question 6:

Complete the puzzle using words for types of motion.

(1) A spring is stretched and one end is released.
(2) A minute hands
(3) A see-saw
(4-5) Children in march-past
(6) A stone rolling down a hillside.