**JESUS AND MARY SCHOOL AND COLLEGE**

**SUBJET: PHYSICS**

**CHAPTER NAME-MOTION**

**CLASS – VII WORKSHEET – 1**

***TOPIC: REST AND MOTION***

***REST:***An object is said to be in a state of rest if it does not change its position with respect to its surroundings with time. For example, trees, houses and building are at rest because their position does not change with respect to their surroundings.

***Explanation:***Suppose we have a book lying on the table. So, we just put the book on the table and after sometime when we look at the book, it remains at the same position with respect to surroundings. Hence, it is said that the book is in state of rest. Certain things which do not change their position with respect to time is known as at rest.

***MOTION:***An object is said to be in motion if its position changes with respect to its surrounding and time. Examples: moving cars, flying birds etc.

***Explanation:***The things that are moving like boys who are running and birds that are flying are said to be in motion.

***TOPIC: - REST AND MOTION ARE RELATIVE TERMS***

***Explanation:***Motion and rest are relative terms. That means, it all depends upon the observer who is observing the object. Ex- A person standing in a moving bus is at rest with respect to bus and in motion with respect to observer on the ground.

***TOPIC: TYPES OF MOTION***

Motion can be categorized into translator, rotatory, oscillatory, vibratory, periodic, non-periodic, multiple and random motion.

* ***TRANSLATORY MOTION:***The motion in which all points of a moving body move uniformly along same line is called translatory motion.

There are 2 types of translatory motion.

1. ***RECTILINEAR MOTION:***If a body moves along a straight line, its motion is called rectilinear motion. Example: A girl walking straight down a path.
2. ***CURVILINEAR MOTION:***If a body moves along a curved or circular path, then the motion is known as curvilinear motion. Examples: The spinning wheel, a car taking turn on a road etc.
* ***ROTATORY MOTION:***If a body moves about a fixed axis without changing the radius of motion, it is said to be in rotatory motion. Examples: The motion of the blades of the fan, the motion of the potter’s wheel etc.
* ***OSCILLATORY MOTION:***When a body as a whole moves back and forth (to and fro) about its mean position, its motion is known as oscillatory motion. Oscillatory motion can also be termed as repeated motion in which an object repeats the same movement over and over. Examples: A child on a swing, Pendulum of a clock etc.
* ***VIBRATORY MOTION:***A vibratory motion happens when particle is vibrated about its mean position. Body moves to and fro about its mean position. Ex- Movement of spring, movement of strings in musical instruments like guitar or sitar etc.
* ***PERIODIC MOTION****:* When a body repeats its motion after a fixed interval, then this type of motion is called periodic motion. A motion which is repeated by a body in equal intervals of time. A good example of such motion is rotation of earth and revolution of earth about and around the sun which causes day and night and change of seasons to occur respectively. Example: The revolution of moon around the sun etc.
* ***NON-PERIODIC MOTION****:* If a body does not repeat its motion after regular intervals of time, its motion is said to be non-periodic. Examples: The running of a batsman between the wickets, movement of the body while dancing.
* ***MULTIPLE MOTION****:* If a body exhibit more than one type of motion at the same time, then such motion is called multiple motion. Example: Drawing water from well , the pulley on which the rope runs exhibits circular motion and the bucket shows linear motion.
* ***RANDOM MOTION****:* When a body moves such that is has no fixed path and its motion changes suddenly from one type to another, then the body is said to exhibit random motion. Example: butterfly flying in a garden etc.

***Exercise:***

*Q1.* What is rotatory motion? Give its examples.

*Q2.* Differentiate between periodic and non-periodic motion?

*Q3.* How many types of motion are there? Name them.

*Q4.* Rest and motion are relative terms. Explain.

***TOPIC: - DISTANCE AND DISPLACEMENT***

Distance is defined as the total length of the path travelled from one location to another. Example: A person travels a distance of 5m towards east then 4m towards north and then 2m towards west. Total distance travelled by the person = 5m + 4m +2m =

Displacement is defined as the minimum distance between the initial and final positions of a body during a given time interval. Example: If a person moves 6m north and then moves 4m south then, total distance = 6m + 4m = 10m but, since the person goes 6m towards and then 4m towards south then the according to the given condition, shortest distance between initial and final position of the person is 6m – 4m = 2m. Hence displacement will be 2m.

***TOPIC: UNIFORM AND NON-UNIFORM MOTION***

**Uniform Motion:** When a moving body covers equal distance in equal intervals of time, then the motion is said to be a uniform motion. Examples: A car going along a straight level road at steady speed, earth revolving around the sun (any other planet as well), a cooling fan running at fixed speed.

**Non-uniform motion:** The movement is which the body or the object does not cover the same distance in same time intervals. A body is said to be in a non-uniform motion if it travels unequal distances in equal intervals of time. Example: if we drop a ball from the roof of a tall building, we will notice that it will cover unequal distances in equal interval of time. Like 5m in the 1st second, 15m in the 2nd second and so on.

***AVERAGE SPEED:***When an object is in non-uniform motion, its speed keeps on changing. In such, cases we calculate the average speed of the object. Average speed can be calculated by dividing the total distance that something has travelled by the total amount of time it took to travel the distance. Mathematically,

Vaverage =$ \frac{Total distance travelled }{time taken}$

***TOPIC: MASS AND WEIGHT***

**MASS:** Mass is a measure of the amount of matter in an object. Mass is usually measured in grams (g) or kilograms (kg). Mass always stays the same while weight changes with change in gravity.

***WEIGHT:***Weight is defined as the force exerted on a body by gravity.

W = m x g

Where, W = weight of the body

 m = mass of the body

 g = gravitational acceleration.

S. I. unit of weight is Newton (N). The other unit used for measuring weight is kilogram force (kgf). Ex – You may weigh 60 kilograms on Earth, but in outer space you would be weightless. The reason behind is that in outer space the body does not experience any kind of gravitational force.

**[A] Fill in the blanks:**

1. If a body exhibit both rotatory as well as translator motion, its motion is called \_\_\_\_\_motion.
2. If a body moves along a straight path, its motion is \_\_\_\_\_\_
3. When a body has more than one motion at the same time, then the motion is \_\_\_\_\_
4. The S.I. unit of mass is kg and of weight is \_\_\_\_\_\_\_
5. The motion spinning top and giant wheel are examples of \_\_\_\_\_motion.

**[B] Answer the following questions:**

1. Differentiate between mass and weight.
2. What is uniform motion? Give example.
3. What is the S.I. unit of mass and weight?
4. How would determine the average speed in a motion?

**[c] Write true or false for the following statements:**

1. Translatory and vibratory motions are same.
2. The movement of the moon around the earth is a periodic motion.
3. Rest and motion are relative terms.
4. A body lying on a table is an example of a body neither at rest nor in motion.

**NOTE: Please do this work in your old copies which will be checked when the school reopens. Please consider this important.**