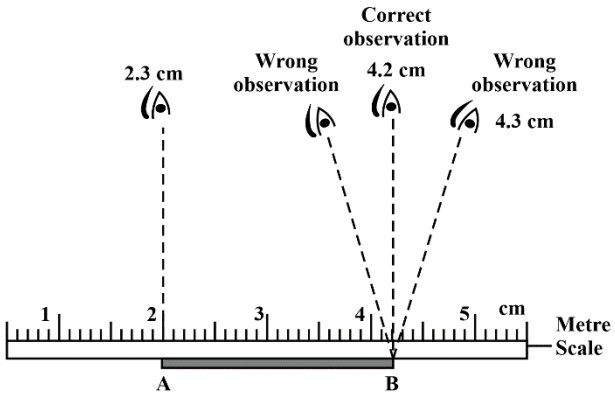
G. Answer the following questions in brief:

Q1. Define Parallax Error.

Answer: A parallax error is the apparent shift in an object's position as it is viewed from different angles.



Generally, parallax error takes place when the measurement of the length of a body is either less or more than the actual length. Parallax error takes place, when we measure the length from a different angle. Parallax error is common while taking the measurements. So, for that we need to place our eye correctly as parallax error generally takes place due to the wrong positioning of the eye.

Q2. Give two examples each of modes of transport used on land, water and air.

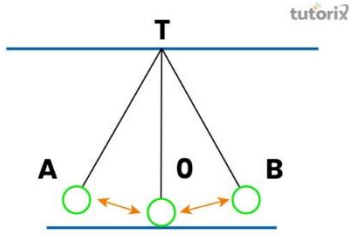
Answer: Examples of modes of transport used on **land** are buses, cars, and so on.

Examples of modes of transport used on the **water** are boats, ships, and so on.

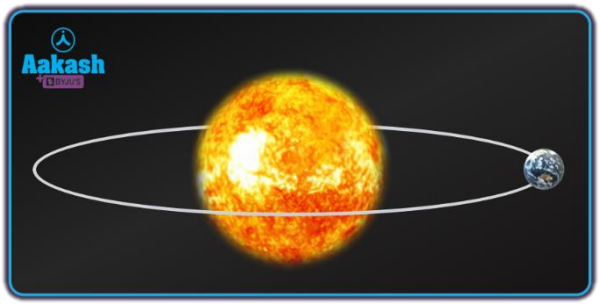
Examples of modes of transport used in the **air** are airplanes, helicopters, and so on.

Q3. Define the following. (a) Periodic Motion (ii) Circular Motion

Answer: A motion that repeats itself after equal intervals of time is known as periodic motion.



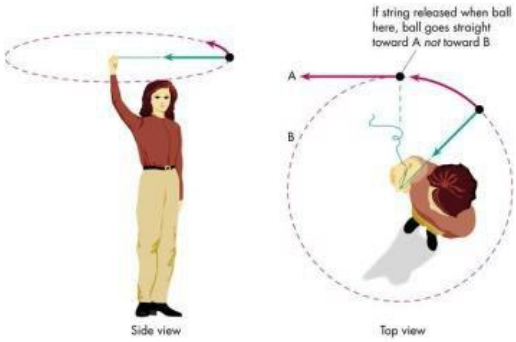
Examples of periodic motion: a tuning fork or motion of a pendulum if you analyse the motion you will find that the pendulum passes through the mean position only after a definite interval of time. We can also classify the above motion to be oscillatory. An oscillatory is a motion in which the body moves to and fro about a fixed position. Example: Motion of clock and movements of planet round Sun.



(i) **Circular motion:** The motion of an object through a circular path is said to be circular motion.

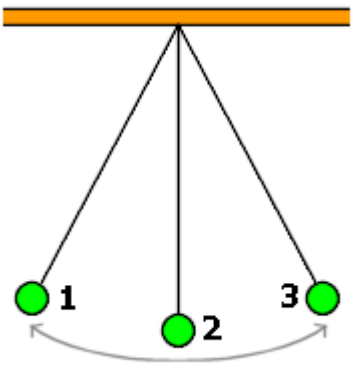
If an object moving along a circular path covers equal distance in equal intervals of time it is said to be uniform circular motion.

The motion in which the objects move along a circular path is called as circular motion. Example: Swirling of stone tied to a string, hands of a clock, blades...



Q4. What kind of motion are observed in the pendulum of a clock?

Answer: The pendulum swings from one end to another. This is a to and fro motion which takes equal amount of time for each swing. Hence it is an oscillatory motion. Pendulum of a wall clock undergoes oscillatory motion as it oscillates about its mean position. Moreover, the motion repeats itself after regular intervals of time. Hence, it is periodic too. As the bob does not move along a straight line, the motion is not linear. It is a non-linear motion.



Q5. What is motion?

Answer: Motion is a change in position of an object over time. Motion is described in terms of displacement, distance, velocity, acceleration, time and speed.

II. Answer the following questions in details:

Q1. What are SI Units? What are the advantages if SI unit over traditional units?

Answer: The SI unit units are the standard system of units which are stated as the International standards for the measurements. These are accepted and followed all across the world. The SI unit for the measurement of mass is kilogram, for length is meter and time is seconds.

The greatest advantage of SI is that it has only one unit for each quantity (type of measurement). This means that it is never necessary to convert from one unit to another (within the system). For example, the one and only SI unit of length is the meter (m).

Q2. Explain with the help of examples that rest and motions are relative terms.

Answer: Yes, rest and motion are relative terms; a body can appear to be at rest to one person while appearing to be in motion to another..

Example

Consider a bus in motion and a person sitting outside the bus. The bus is in motion with respect to a boy sitting on a bench outside the bus, but the trees around him appear to be at rest. But to a boy sitting inside the bus, the trees and the boy outside the bus will appear to move in opposite directions and the roof of the bus or driver of the bus will appear to be at rest. So rest and motion are relative terms.

Q3. What kind of error may happen when you are measuring the height of a person taller than you? What should you so to avoid this error?

Answer: Parallax error may happen while measuring the height of a person taller than me. Parallax error is the error that occurs due to the measuring sight. If we measure any quantity, the eye should be set parallel to the measurement made.

Parallax error takes place, when we measure the length from a different angle. Parallax error is common while taking the measurements. So, for that we need to place our eye correctly as parallax error generally takes place due to the wrong positioning of the eye.

Q4.Can a body have multiple types of motions at the same time? Explain with the help of examples?

Answer: Sometime a body can have more than one type of motion. Such a motion is called the mixed motion. Example: The wheels of a moving train have both the translatory as well as the rotatory motions as it moves from position A to position B while rotating.

For example:

a) The motion of earth: The earth keeps on rotating on its axis. As well as revolves around the sun in a curved (elliptical) path in a fixed time interval.

b) Drawing water from the well: In a well, the pulley on which the rope runs exhibits circular motion. And the bucket joined at one end of the rope shows linear motion.

c) A vehicle moving on a straight road: A vehicle moves in a linear motion and its wheels rotate in a circular motion. Also while cycling, the tyres of a cycle rotate but the cycle moves in the forward linear direction.

d) Motion of a drilling machine: A drilling machine that is used to make a hole in wood exhibits two types of motion simultaneously. During drilling, it is being rotated (rotatory motion) and at the same time, it is also getting pushed forward into the wood (translatory motion).

Q5. Covert

1) 20.6 m = 0.0206 km (20.6 / 1000)
2) 3/20 m = _3/20 * 1000_____mm
3) 0.006 km = 0.0206dm
4) 3000 mm = _____dm

According to the question,

(1) We have to convert $20.6m$ to km,

As, $1m = 0.01km$

For converting m to km we have to divide it by 1000

$=> 20.6m = 0.0206km$

(2) We have to convert $3000mm$ to cm,

As, $1mm = 0.1cm$

For converting m to km we have to divide it by 10

$=> 3000mm = 300cm$

Hence, (1) $20.6m = 0.0206km$

(2) $3000mm = 300cm$

3) 0.006 km = _____dm

1 Km = 100 dm

= 0.006 x 100 = 0.6 dm

4) 3000 mm = _____dm

1 meter = 1000 mm

3000 mm = 3 metres

1 meter = 0.1 decametre

3 meter = 0.3 decametre

Q6. If the end of the ruler is broken then start reading from 1.2 cm. The final reading of a pencil 7.6 com. What will be the actual reading of the pencil?

Answer: 7.6-1.2 =6.4cm

is the actual reading of the pencil since ruler broke at 1.2 cm then the reading will start from 1.2 so actual reading minus 1.2 cm.

Q7. Length of the book is 15 cm. What will be the final reading of the ruler if the ruler reads from 2.2 cm?

Answer: The final reading of the ruler if the ruler reads from 2.2cm is 17.2 cm.

⇨ 17.2 cm – 1.2 cm
➔ 15 cm

Q8. All the circular motions are periodic but all the periodic motions are not circular. Why?

Answer: Suppose a car is moving in a circular track. If the car is moving at a constant speed, it takes equal time intervals to cover the circular path. Then, it is said to be in periodic motion.

If the speed of the car changes, it takes different time intervals to cover the circular path. In this case, the car is not in periodic motion.

Thus, a circular motion may not be periodic.

Q9. If you are given an elastic measuring tap, will you be able to accurately measure the length and width of a cricket pitch with it? Justify your answer.

Answer: Since the tape is stretchable and when you will measure anything it will give inaccurate measurements. Therefore we cannot use it for measuring purposes.

Problems:

1. while measuring a distance, we need to tell someone how much tape has been stretched which is difficult to measure. It leads to incorrect measurements.
2. We cannot measure manually how much the tape has been stretched.
3. If you measure the length of an object twice using an elastic tape, then you may get different values of the same length each time. This is because elastic tapes are stretchable.

Q10. At home when you do you see people using skill of estimation? Point out at least two instances and give reasons as to why estimation is more convenient in this cases rather than accurate measurement.

Answer: (a) Accurate measurements are of importance in situations where extreme precision is essential, such as in scientific experiments or in construction of fine tolerance machinery. Here even an error in measurement of weight by 0.1 g can completely change the result of an experiment.

(b) Estimation will suffice in most daily, domestic situations such as the mixing sugar or salt in food items. Here, a difference of 0.1 g in the amount of salt or sugar in food will not even be noticed.

While making food and tea.. Using detergent while washing clothes. In these cases estimation is more convenient because with experience, we get estimated skill of how much ingredients is needed to make food or detergent is required to wash clothes and there is no need to add accurate measurement.

Q11. What is similarity and difference between the motion of car which is slowing down and ceiling fan moving with same speed?

Answer:

Similarities: They both are type of motion so both follow the 1st law of Newton that is an object in motion will be in that condition unless any unbalance force acted upon it.

Difference: They are different types of motion, the motion in car is rectilinear motion and the motion in fan is circular motion.

Q12. Write the similarities and differences between the motion of a bicycle and a ceiling fan that has been switched on.

Answer:

Difference between the motion of cycle and ceiling fan.

Motion of cycle	**Motion of Ceiling fan**
1. Bicycle moves in linear motion.	The ceiling fan moves in a circular motion.
2. Cycle moves in a rectilinear pattern.	Fan blades move in a periodic pattern.
3. When a bicycle rotates, there is rolling friction between the Tyre and the road, which causes rotation.	The rotational motion of a ceiling fan is caused by a magnetic field associated with current travelling through its coils.

Similarities between the motion of the cycle and the ceiling fan.

Motion of cycle	**Motion of Ceiling fan**
1. The wheels of the cycle spin in a circular motion.	The blades of the ceiling fan also move in circular motion.
2. The spokes in the wheels of the cycle is fixed between the cycle hub and the rim.	The fan blades are also fixed with the motors at the center.
3. Cycle motion is rotational around an axis that passes through their centre of mass.	Ceiling fan motion is also rotational motion around an axis that passes through their centre of mass.

Q12. Is the motion of the moon around the earth periodic? Give reasons for your answer.

Answer: The moon moves around Earth in a circular path which is not linear. Moreover, it repeats its motion after a regular interval of approximately 28 days. Hence, the motion can be classified as both circular as well as periodic. However, as the motion is not to and fro about a point, it is not oscillatory.

Q13. A dozen identical books are stacked one above the other to a height of 48 cm. IF 3 more books are added to the stack, then the height of the stack will become. a) 60 cm b) 52 cm c) 0 cm d) 57 cm.

Answer: A dozen = 12

Height of A dozen (12) identical book =48 cm

When 3 more book added =12+3 =15

Height of 1 book =12÷48=4

∴ Height of stack = Height of 15 book (= 4 x 15 = 60cm)

Option (a) is correct.