

CLASS: 7TH SUBJECT: PHYSICS EXAMINATION: FA-1 AND FA-2

CHAPTER 1: PHYSICAL QUANTITIES AND MEASUREMENTS

Short-answer type questions

Q1. Define volume. Write its SI units.

Ans) The space occupied by an object is called its volume. The SI unit of volume is m³.

Q2. What is meant by density of a body? Write the SI unit of density.

Ans) the density of an object is defined its mass per unit volume. The SI unit of density is kg/m³.

Q3. What is the relative density of a substance? What is its Si unit?

Ans) The relative density of a body is defined as the ratio of density of the material of the body to that of water. As it is the ratio of two similar quantities thus it has no units.

Q4. The weight of a body is the force with which it is attracted by the earth's gravity. The SI unit of weight is newton(N).

Q5. The relation between mass and weight of an object is that weight is equal to constant times of its mass.

Weight=constant × mass

Q6. What is relative density of water?

Ans) The relative density of water is unity i.e., 1.

Long-answer type questions

Q1. Draw an irregular shape on a graph paper and explain how would you calculate its area?

Ans) refer to page no. 1 of textbook. Activity no. 1

Q2. How would you measure the volume of an irregular solid?

Ans) When an irregular solid is immersed in water, it makes space for itself by displacing water. Obviously, the volume of water displaced by the solid is equal to the volume of the irregular solid.

Take some water in a measuring cylinder. Read the level of water. Tie a string around the irregular solid and lower it gently into water till it is completely submerged. Read the level of water again. The difference between two readings gives the volume of the solid.

Q3. How would you determine the density of a cube?

Ans) The density of a cube is determined by knowing the mass and volume of the cube. To calculate the density of cube, the mass of the cube is divided by its volume. The density is expressed as kg per cubic meter (kg/m^3).

Q4. Distinguish between density and relative density of a substance.

Ans)

density	Relative density
<p>i. Density of a substance is equal to its mass per unit volume.</p> <p>ii. $\text{Density} = \frac{\text{mass of substance}}{\text{volume of substance}}$</p> <p>iii. Its unit is kg/m^3</p> <p>iv. It is a simple term.</p>	<p>i. Relative density of a substance is the ratio of its density to density of water.</p> <p>ii. relative $\text{density} = \frac{\text{density of substance}}{\text{density of water}}$</p> <p>iii. It has no units.</p> <p>iv. it is a relative term.</p>

Note: book work should be done by yourself.

Numerical problems will be solved in class room during regular classes.

Short-answer type questions

Q1. How would you usually judge the state of rest or of motion of a body?

Ans) We usually judge the state of rest or of motion of a body by comparing its position relative to stationary landmarks in its surroundings. When the position of an object does not change with respect to other objects, we say it is in rest. On the other hand, when the position of object changes with respect to other objects, we say it is in motion.

Q2. Name three types of regular motion.

Ans) The three types of regular motion are: translatory motion, Rotatory motion and Oscillatory motion.

Q3. What is periodic motion? Give an example.

Ans) A motion that is repeated after some fixed intervals of time is called periodic motion. E.g., Motion of earth around the sun.

Q4. Briefly describe oscillatory motion. Give two examples.

Ans) An oscillatory motion is the periodic motion of a body about its mean position. In this motion an object moves to-and-fro about a point which is the middle position or mean position. The motion of the object is repetitive i.e., it repeats itself after fixed intervals of time. E.g., the motion of a pendulum and a swing oscillate are oscillatory motions.

Q5. What is meant by the mean position of a simple pendulum?

Ans) The position of a simple pendulum where the string is vertical and the pendulum is at rest is said to be the mean position of the simple pendulum.

Long-answer type questions

Q1. Explain the statement "all motion is relative".

Ans) Motion is not a simple term. It is a relative term. An object is in motion if it changes its position relative to a fixed point called point of reference. An object may be at rest with respect to one point and the same object may be in motion with respect to some other point of reference. E.g., a person sitting in a bus is at rest with respect to other passengers sitting in the bus, but the same person is in motion with respect to the road outside. So in general, all motion is relative.

Q2. Explain translatory, rotatory and oscillatory motions with examples.

Ans) a. translatory motion: When an object moves from one point to another along a straight line or a smooth curve, its motion is called translatory motion. In translatory motion the object does not change its direction along the path. E.g., An object under free fall has translatory motion.

b. Rotatory motion: When an object turns or rotates or spins about an axis passing through itself, its motion is called translatory motion. E.g., motion of earth about its own axis.

c. Oscillatory motion: When an object moves to-and-fro periodically about its mean position, its motion is called oscillatory motion. Oscillatory motion is repetitive i.e., the object repeats its motion after some fixed intervals of time. E.g., the motion of a simple pendulum is oscillatory motion.

Q3. What is circular motion? How is it different from rotatory motion? When a body rotates, can parts of it be said to follow circular path?

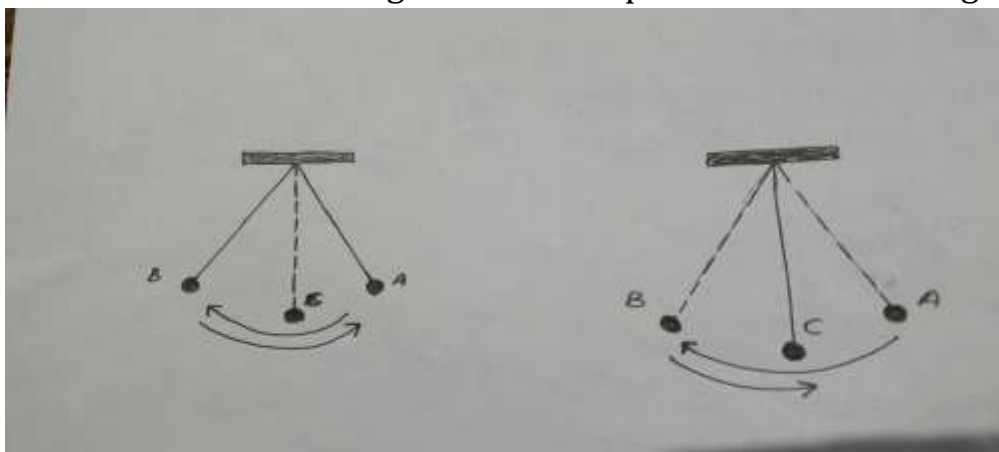
Ans) When a body moves around a circular path, its motion is called circular motion. In a circular motion, the position of the object keeps changing with time, but its distance from the center of the path remains the same. Circular motion is different from rotatory motion because in rotatory motion an object turns or rotates or spins about an axis passing through itself. When an object rotates, its parts also rotate at a constant distance from the center. So, the parts of it are said to follow a circular path.

Q4. Can a body have more than one type of motion at the same time? Explain with two examples.

Ans) yes, a body can have more than one type of motion at the same time. E.g., the wheels of a moving car have the same translatory motion as the car. In addition, each wheel has a rotatory motion about its own axis. A spinning top has a rotatory motion as it rotates about an axis that lies at the tip of the top. A spinning top also has a circular motion as it moves around a circular path on a smooth plane surface.

Q5. What is one oscillation of a simple pendulum? (you can use a sketch to explain your answer.) How does the time period of a simple pendulum depend on its length, amplitude of its oscillations and the mass of the body?

Ans) One oscillation of a simple pendulum can be described as its motion from one extreme position to other and then back to its initial position, or its motion between two consecutive crossings of the mean position while moving in same direction.



One oscillation is the motion of the pendulum from A to B and then back to A or from C to A to B to C.

Time period of simple pendulum depend on its length. It increases with increase in length. It does not depend on the amplitude as long as long as the amplitude is small. It also does not depend on the mass of the bob.

Q6. What is meant by seconds pendulum? Describe how such a pendulum can be set up?

Ans) A pendulum with a time period of exactly 2 seconds is called a seconds pendulum. Its length is very close to 1m and it takes exactly 1s to swing from one side to another side.

In order to set up a seconds pendulum, the length of string should be close to 99cm and the time period of the pendulum is calculated. If it is slightly different from 2s then we need to alter its length to get exact value.

Q7. Distinguish between speed and velocity. Give one example of a moving body whose speed remains constant but velocity changes continuously.

Ans)

Speed	Velocity
1. Speed is the rate of change of distance covered by a body.	1. Velocity is the rate of change of displacement of a body.
2. $Speed = \frac{distance}{time}$	2. $Velocity = \frac{displacement}{time}$
3. Speed is a scalar quantity.	3. Velocity is a vector quantity
4. Speed cannot be zero	4. Velocity can be zero

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