

KINEMATIC

Q2 Explain translatory motion give examples of various types of translatory motion.

Ans The motion of the body along a line is called "translatory motion". This motion is without rotation. Translatory motion has following categories.

(i) Linear motion (ii) circular motion (iii) Random motion

Example of linear motion:-

The motion of freely falling and motion of aeroplane.

Example of circular motion:-

The motion of stone, tied at one end of a string and whirled in a circle, has circular motion

Example of Random motion:-

The irregular motion of birds, insects and motion of molecules of gas are example of random motion

Q3 Differentiate between the following:-

(i) Rest and Motion:-

When body change its position w.r.t surrounding then it is in motion and when it does not change its position w.r.t to its surrounding then it is at rest.

(ii) circular motion And rotatory motion:-

When body moves an circumference of a circle then it is circular motion but when body spins about it own axis then it is rotatory motion. (6)

(iii) Distance and displacement:-

Total distance covered along a path of any shape is called distance covered. But shortest possible distance between the initial and final position of a moving body is called displacement.

(iv) Speed And velocity:-

Distance covered per second is called speed and the displacement made per second is called velocity.

(v) Linear And random motion:-

Motion along straight line is called linear motion but motion along zigzag path is called random motion.

(vi) Scalar And vector:-

Scalar quantities have magnitude and units. But vector quantities have magnitudes + units + direction.

Q4 Define speed, velocity, and acceleration.

Ans: Speed = distance covered per second

Velocity = rate of change of displacement

Acceleration = rate of change of velocity.

Q5. Can a body moving a constant speed have acceleration?

Ans: Yes, it is possible

The uniform circular motion is an example of a body which moves with constant speed but has acceleration

(centrifugal)

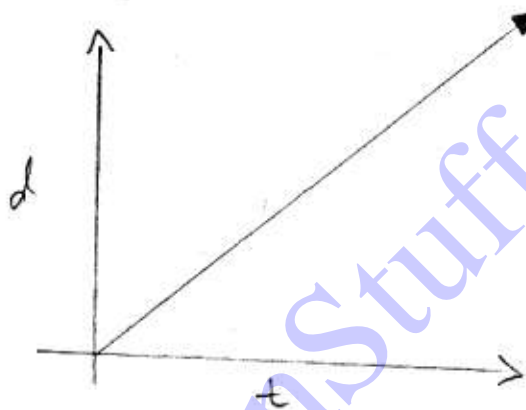


Q6 - How do riders in a Ferris wheel passes translatory motion but not circular motion? ⑦

Ans: The rider donot moves in a circular of constant radius therefore their motion is not circular.

Q7 - Sketch a distance-time graph for a body starting from rest. How will you determine the speed of body from this graph?

Ans: The shape of graph is show in fig.



The slope of this graph gives $(= \frac{d}{t})$ velocity

Q8 What would be the shape of a speed-time graph of a body?

- (i) Initial speed
- (ii) Final speed
- (iii) Distance covered in time
- (iv) Acceleration of motion

From the velocity time graph we can calculate we can find

- (i) Initial and final speed
- (ii) Acceleration
- (iii) Distance covered

Q10- How can vector quantities be represented graphically?

Ans: Graphically a vector quantity is represented by a straight line with arrow-head at its one end. The length of its straight line represents magnitude and arrow-head shows the direction of vector.

Q11- Why vector quantities cannot be added and subtracted like scalar quantities,

Ans: In addition of vector quantities, not only their magnitude but their direction are also evaluated. Therefore vector cannot be added like the additions of scalars.

Q12- How are vector quantities important to us in our daily life?

Ans: In our daily life, the vector quantities are completely expressed or explained only when their direction are also considered.

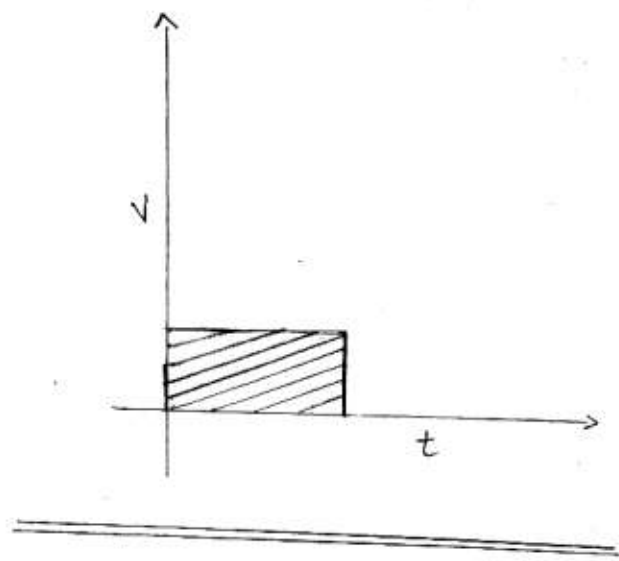
Q13- Derive equations of motion for uniformly accelerated rectilinear motion?

Ans: Uniformly accelerated moving bodies have three equations of motion.

- (i) $v_f = v_i + at$
- (ii) $s = v_i t + \frac{1}{2} a t^2$
- (iii) $2as = v_f^2 - v_i^2$

Q14- Sketch a velocity - time graph for the motion of the body. From the graph explaining each step, calculate total distance covered by the body.

Ans: The special shape of velocity - time graph is shown in figure.



Lesson no 3

: DYNAMIC :

Define following terms :-

(i) Inertia :-

The property of material body to resist against any change in its linear motion.

(ii) Momentum :-

The magnitude of motion is called momentum. Its formula is $P = mv$.

(iii) Force :-

The agency which produces acceleration is called force.

(iv) Force of Friction :-

The resistive force between to bodies is contact is called "Force of Friction".

(v) Centripetal Force :-

Centripetal is a force that keep the body to moves in a circle