QUESTIONS : CHAP. 3 :- (35)

Q. 3.1 :- what is difference .....

ANS. :- (i) **Uniform velocity** :- The velocity of a body is said to be 'uniform velocity' if its magnitude and direction do not change with time. e.gs. (i) velocity of earth (ii) velocity of a satellite.

(ii) **Variable velocity** :- The velocity of a body is said to lee variable if its magnitude or direction (or both) changes with time. A motion with variable velocity is called accelerated motion. In this case velocity may lee increasing or decreasing. For example: Motion of a car on the road.

Acceleration : "The rate of change of velocity is called acceleration".

when the velocity of a body increases, acc. is +ve and when the velocity decreases, acc. is -ve.

Units :- The SI-Units of velocity is 'm/s' and that of acc. is 'm/s^2'.

Q. 3.2 :- An object is thrown .....

ANS. :- when an object is thrown upward, its velocity is taken '+ve' but acc. due to gravity 'g' is -ve, as the object is moving against the direction of gravitational force. But at max. height its velocity become zero and then it start moving down. Now its velocity and acc. due to gravity 'g' are both '+ve'.

Q. 3.3. Can the velocity ....

ANS. :- Yes, velocity of an object can reverse direction when initially velocity and acc. are in opposite directions. For example: when a body is thrown vertically upward its velocity goes on decreasing (due to -ve 'g'), become zero at max. height, and then the body reverses direction and starts falling downward.

Q. 3.4 :- Specify the correct ....

ANS. :- All statements are correct except (a).

Examples : (b) circular motion
(c) In upward motion at max. height.
(d) vertical motion (Q. 3.3.)

Q. 3.5 :- A man standing .....

ANS. :- Both the balls will have the same speed on striking the ground. The ball thrown upward will pass from the same pt. with same velocity while moving down and gains the same velocity as that of the ball thrown vertically down, untill it reaches the surface of earth.

Q. 3.6 :- Explain the circumstances .....

ANS. :- (i) when '$\vec{v}$' and '$\vec{a}$' are parallel, then velocity of the car is increasing.

(ii) when '$\vec{v}$' and '$\vec{a}$' are anti-parallel, then velocity of the car is decreasing.

(iii) when "$\vec{v}$" and "$\vec{a}$" are perpendicular, the car is moving along a circular path.

Here velocity is along the tagent and acceleration is along the radius.

(IV) $\vec{v}$ is zero at the moment when the car comes to rest but acc. was -ve and not zero at that moment or when there is a hurdle in front of the car and it can't move even in the presence of force. (V) when car moves on a straight road with uniform speed (neglecting friction).

Q. 3.7 :- Motion with .....

ANS. :- yes, motion with constant velocity is a special case of motion with constant acceleration. In this case the acc. of an object is zero and velocity is uniform.

Q. 3.8 : Find the Change ....

ANS. :- Please see theory - Book P-56 to 57, Topic on: "Momentum and Newton's 2nd law of motion".

Q. 3.9 :- Define Impulse .....

ANS. :- Impulse is defined as the product of force and time i.e. Impulse = Force x time.

or $\vec{I} = F \times t = m\vec{v}_f - m\vec{v}_i$

or $\vec{I} = \vec{p}_f - \vec{p}_i = \Delta\vec{p}$ = change in mom.

$\therefore \quad \vec{I} = \Delta\vec{p}$.

Q. 3.10 :- State the law .....

ANS. :- **Law of cons. of linear Momentum**:- This

law states that "the total linear momentum of an isolated system remainst constant." An isolated system is a system of bodies free from external influence. This law holds good only for an isolated system. But under certain conditions where external forces are very small as compared to mutually interacting forces, the law can lee applied to a good approximation.

Q. 3.11 :- Explain the difference .....

ANS. :- A collision in which total momentum and K.E. remains constt before and after collision is called elastic collision. In a collision where K.E. is not constt, is called inelastic collision.

Ideally the bouncing ball should rebound to the same height in case of an elastic collision, but if it rebounds to very nearly to the initial height, the collision is considered as elastic one. In case of in-elastic collision, the ball will rebound to a small height as compared to the dropping height.

In most cases where two or more bodies collide, some of their K.E. is changed into heat and sound and some is lost due to friction. Hence K.E. is not conserved in most cases.

Q. 3.12: Explain what is .....

ANS. :- Please see theory – Topic on : Projectile Motion.

Q.No. 3.13 : At what point .....

ANS. :- A projectile has its min. speed at the max. height where vertical component of velocity becomes zero. The projectile has its maximum speed at the pt. of projection and at the point of landing if air friction is neglected.

Q.No. 3.14 : Each of the .....

ANS :- (i) The statement (a) is correct, as "a ballistic trajectory is the path followed by an un-powered and un-guided projectile".

(ii) The statement (b) is correct, as momentum of the system does not change.