IX — Uniform Circular Motion

Q] Why uniform circular motion is an accelerated motion?

Ans] When the body is in a uniform circular motion, the velocity changes continuously due to change in direction of motion at every point even though the speed remains constant. Hence due to change in velocity uniform circular motion is an accelerated motion.

Linear motion	Circular motion
1] Body is moving in a straight line	1] Body is moving in a circular path.
2] If the body is moving with continuous speed, then there is no acceleration.	2] There is acceleration even if the body is moving with a constant speed.
3] Eg. - car moving on a straight road.	3] Eg. - earth moving around sun.

* In UCM direction of motion at any point is along the tangent to the circular path.

Q] State which of the following situation is possible & give an example for each:-

(a) an object with a constant acceleration but with zero velocity
an object moving in a certain direction with an acceleration in the perpendicular direction.

Ans (a) When a body is thrown vertically upwards the body comes to rest for a small moment at the highest point from where it starts falling back. At this point velocity is zero but acceleration is $a = 9.8\ m/s^2$ (due to gravity).

(b) When a body is in circular path, the direction of motion at any point is along the tangent at that point but acceleration is along the radius of circle directed towards centre. Hence acceleration & direction of motion are perpendicular to each other.