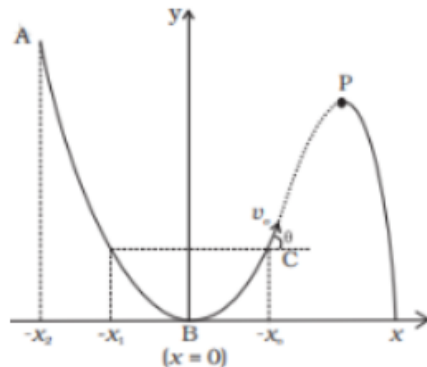


## QUES 02:-

A particle slides down a frictionless parabolic ( $y = x^2$ ) track (A – B – C) starting from rest at point A (Fig.). Point B is at the vertex of the parabola and point C is at a height less than that of point A. After C, the particle moves freely in the air like a projectile. If the particle reaches the highest point at P, then



- i. KE at P = KE at B
- ii. height at P = height at A
- iii. total energy at P = total energy at A
- iv. time of travel from A to B = time of travel from B to P

**Sol.** Energy is always conserved (unless it is an inelastic collision), therefore total energy at point A and P will always be equal as no energy is being lost due to friction.

But, Kinetic Energy will not always remain the same, as it depends on the velocity of the particle. When Object is at Point P, its velocity will be zero (Highest point) but the velocity at B will not be equal to zero.

Height at P will be less than Height at A as the object at the highest point has zero velocity that means it is devoid of any kinetic energy, and has only potential energy. Whereas at point A, the object has partly kinetic and partly potential energy (Energy conservation law)

Time Taken from A to B will be more compared to B to P, as the distance from A to B is more compared to B to P. (Height A is more compared to Height P)