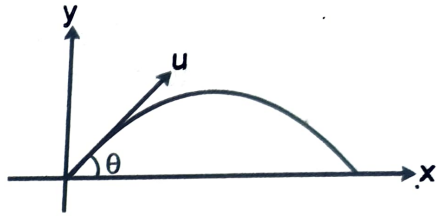
A particle of mass'm' is projected on horizontal ground with an initial velocity of u making an angle θ with horizontal . Find out the angular momentum at any time t of particle p about :

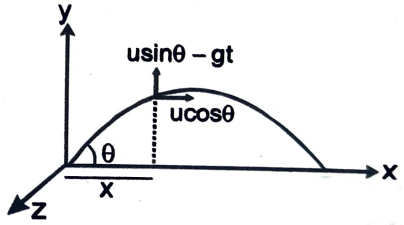


(i) y axis

(ii) z-axis

Solution :

(i) velocity components are parallel to the y-axis. so, L = 0



(ii) $\tau = \frac{dL}{dt} - 1/2\ mu \cos\theta .\ gt^2$

$-mgx = \frac{dL}{dt}$

$-mgx\,dt = dL$

$$\int_0^t -mgx\,dt = \int_0^L dL$$

angular momentum about the z-axis is :

$L = -1/2\ mu \cos\theta .\ gt^2$ Ans.