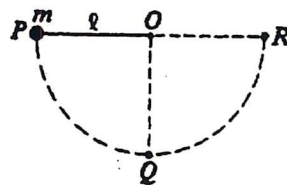


23. A bowling ball of mass  $M$  and radius  $R$ , whose moment of inertia about its center is  $\frac{2}{5}MR^2$ , rolls without slipping along a level surface at speed  $v$ .

The maximum vertical height to which it can roll if

it ascends an incline is

- (A)  $\frac{1}{5} \frac{v^2}{g}$   
 (B)  $\frac{2}{5} \frac{v^2}{g}$   
 (C)  $\frac{1}{2} \frac{v^2}{g}$   
 (D)  $\frac{7}{10} \frac{v^2}{g}$   
 (E)  $\frac{v^2}{g}$



24. A ball of mass  $m$  is attached to the end of a string of length  $l$  as shown above. The ball is released from rest from position  $P$ , where the string is horizontal. It swings through position  $Q$ , where the string is vertical, and then to position  $R$ , where the string is again horizontal. What are the directions of the acceleration vectors of the ball at positions  $Q$  and  $R$ ?

	<u>Position <math>Q</math></u>	<u>Position <math>R</math></u>
(A)	Downward	Downward
(B)	Downward	To the right
(C)	Upward	Downward
(D)	Upward	To the left
(E)	To the right	To the left