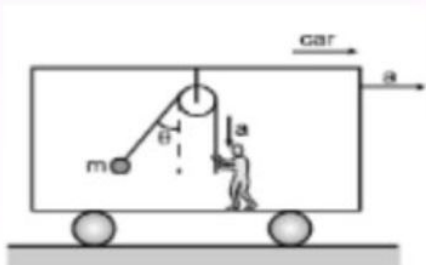


A bob is hanging over a pulley inside a car through a string. The second end of the string is in the hands of a person standing in the car. The car is moving with constant acceleration a directed horizontally as shown. The other end of the string is pulled with constant acceleration a vertically down. Find the tension in the string.



A $m\sqrt{g^2 + a^2}$

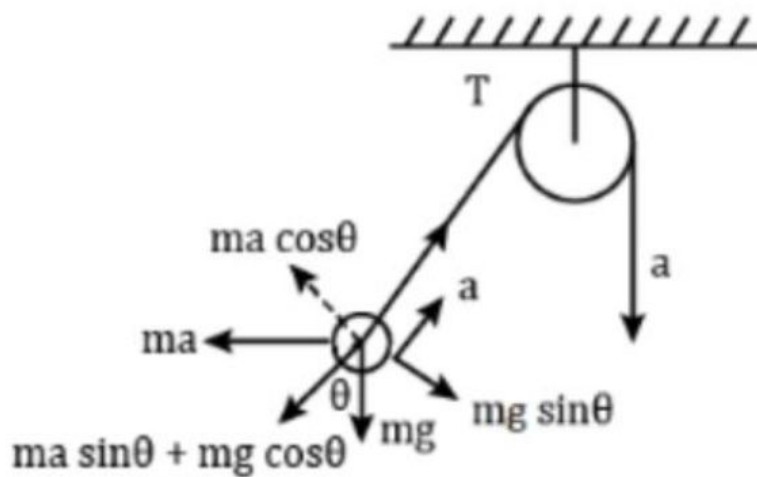
B $m\sqrt{g^2 + a^2} - ma$

C $m\sqrt{g^2 + a^2} + ma$

D $m(g + a)$

The correct option is **C** $m\sqrt{g^2 + a^2} + ma$

Using the concept of pseudo force in the frame of the car, we have



Perpendicular to string, we get

$$ma \cos \theta = mg \sin \theta \Rightarrow \tan \theta = \frac{a}{g}$$

Along the string, we get

$$T - mg \cos \theta - ma \sin \theta = ma$$

$$\Rightarrow T = m\sqrt{g^2 + a^2} + ma$$