Sticking of a Block with Accelerated Cart.

When a cart moves with some acceleration toward right then a pseudo force (ma) acts on block toward left.
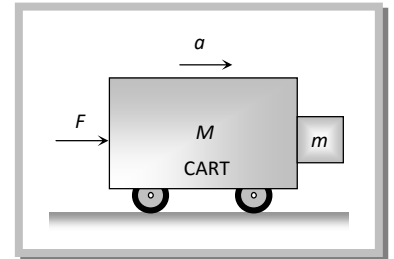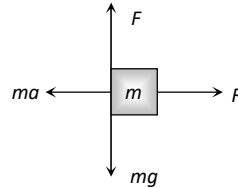
This force (ma) is action force by a block on cart.

Now block will remain static *w.r.t.* block. Iffriction force $\mu R \geq mg$

$\Rightarrow \mu ma \geq mg \ [\text{As } R = ma]$

$\Rightarrow a \geq \dfrac{g}{\mu}$

$\therefore \qquad a_{min} = \dfrac{g}{\mu}$

This is the minimum acceleration of the cart so that block does not fall.

and the minimum force to hold the block together

$\qquad F_{min} = (M+m)a_{min}$

$\qquad F_{min} = (M+m)\dfrac{g}{\mu}$