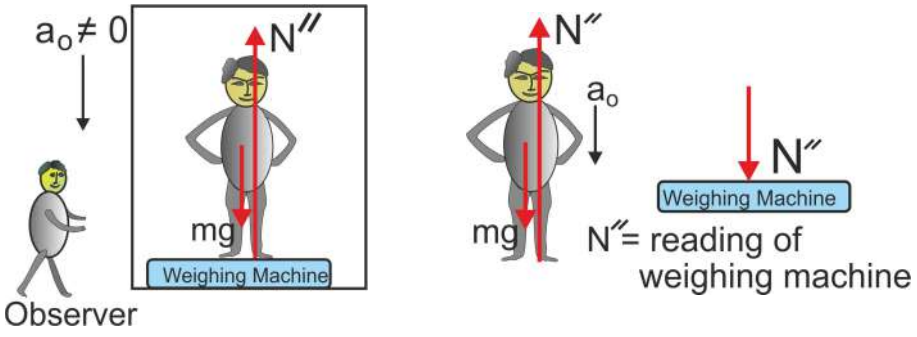
$$g' = \frac{N'}{m} \quad \text{or} \quad g' = g + a \qquad \ldots\ldots\ldots \text{(iv)}$$

Case (C): When the lift moves down with acceleration '*a*'.



$$\sum F_y = ma_y$$

$$mg - N'' = ma$$

Or $$mg - ma = N''$$

Or $$N'' = m(g - a) \qquad \ldots\ldots\ldots\ldots \text{(v)}$$

i.e., $$N'' < mg$$

i.e, the effective weight of the body inside a lift moving down with acceleration is lesser than its actual weight.

Effective value of acceleration due to gravity

$$g' = \frac{N''}{m}$$

$$\boxed{g' = g - a} \qquad \ldots\ldots\ldots\ldots \text{(vi)}$$

If suddenly the rope holding the lift breaks then the lift moves down with

$$a = g$$

Then by eq. (v) $$N'' = 0$$

That is the body feels weightlessness.

Case (D) : If the lift is accelerated downwards such that a > g:

In this case by equation (v)

$\therefore$ Apparent weight = m(g – a) = – ve

So the man will be accelerated upward and will stay at the ceiling of the lift.