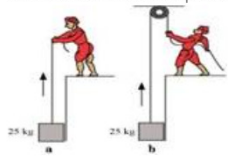## QUES 08

A block of mass 25 kg is raised by a 50 kg man in two different ways as shown in Fig. What is the action on the floor by the man in the two cases? If the floor yields to a normal force of 700 N, which mode should the man adopt to lift the block without the floor yielding?

Sol. Given,

mass of block is given by(m) = 25 Kg

mass of the man is given by(M) = 50 Kg

Force required to lift the block is (F) = weight of block = mg = 25 × 10 = 250 N

also, the weight of a man is = Mg

hence, weight is given by = 50 × 10 = 500 N

For Case a.

see figure (a), if block raised by man as shown in figure (a) then, force is applied by man in the upward direction by which weight of mass increases.

hence, Normal reaction on the floor by man is given by = Force applied by man + weight of the man

= F + weight of the man

= 250 N + 500 N = 750 N

For Case b

if block raised in such as shown in figure (b). then, force is applied by man in the downward direction. Hence, the weight of man decreases in this situation. Hence,

Normal reaction applied on the floor applied by man is given by = weight of man - the force required to lift the block

= 500 - 250 = 250 N

if the floor yields a normal reaction force of 700 N, it means action on the floor exceed 700 N in case (a) and less then 700 N in case (b).

hence, 2nd case has adopted to lift the block without the floor yielding.