

The mass of the empty plastic box is  $m$  and its acceleration  $a = g/6$  is upward. If sand of mass  $M$  is put into box the mass becomes  $m+M$  and acceleration becomes  $a = -g/6$ . Let  $B$  be the force of buoyancy. Then

$$\begin{cases} -mg + B = \frac{mg}{6} \\ -(m + M)g + B = -\frac{(m + M)g}{6} \end{cases} \gg -Mg + \frac{mg}{6} = -\frac{(m + M)g}{6} \gg M = \frac{2}{5}m$$