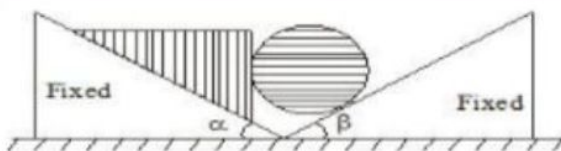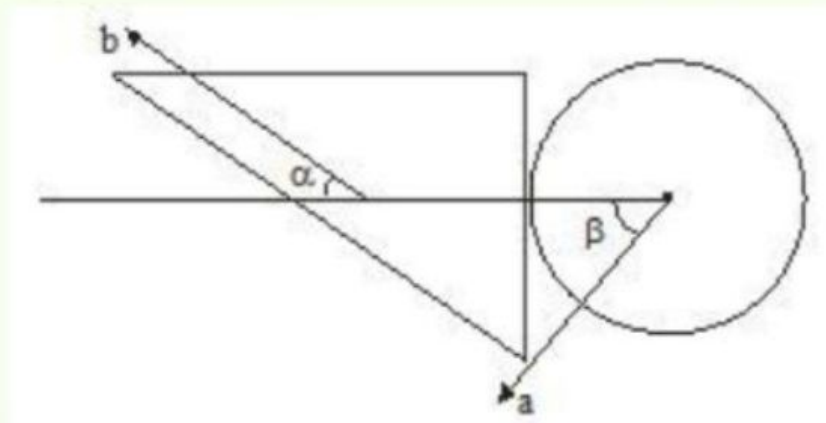A cylinder and a wedge of same mass (m) with a vertical face, touching each other, move along two smooth inclined planes forming an angle and respectively with horizontal as shown in the figure. Determine the force of normal N (In newton) exerted by the wedge on the cylinder, neglecting the friction between them. Consider $m = \frac{1}{\sqrt{3}}$kg; $a = 60°$; $\beta = 30°$ and $g = 10m/s^2$. ____

5

By constrained motion

$a \cos\beta = b \cos\alpha \quad \cdots \text{ (i)}$
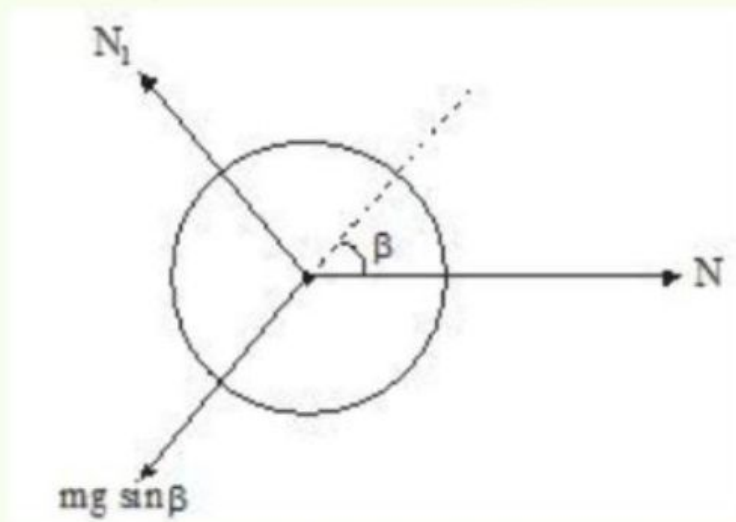
$mg\sin\beta - N\cos\beta = ma \quad \cdots \text{ (ii)}$

For wedge:
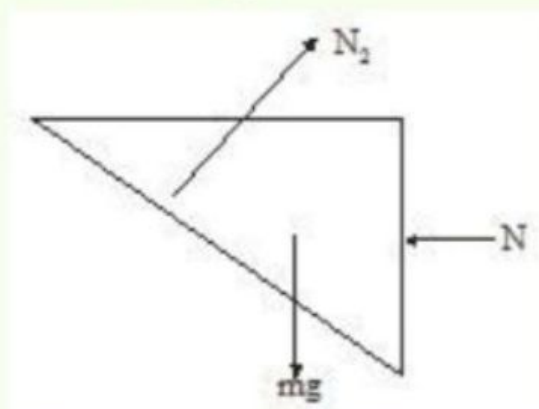
$N\cos\alpha - mg\sin\alpha = mb \quad \cdots \text{ (iii)}$

From (i), (ii) and (iii), we get

$N = 5$ newton