QUES 03:-

The minimum force required to start pushing a body up a rough (frictional coefficient μ) inclined plane is F_1 while the minimum force needed to prevent it from sliding down is F_2. If the inclined plane makes an angle θ from the horizontal such that $\tan\theta = 2\mu$ then the ratio $\frac{F_1}{F_2}$ is :- **[AIEEE - 2011]**

(1) 4 (2) 1 (3) 2 (4) 3

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Solution 2) friction will always act to prevent relative motion.

(i) when we push up.

$f_1 = f_r + mg\sin\theta$

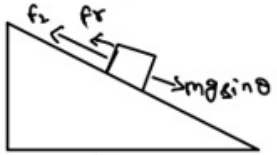
$= \mu mg\cos\theta + mg\sin\theta$

$= \frac{mg\sin\theta}{2} + mg\sin\theta$

$f_1 = \frac{3mg\sin\theta}{2}$

(ii) When we try to prevent it from sliding (tendency to go down)

↓ friction act up.



$f_r + f_2 = mg\sin\theta$

$f_2 = mg\sin\theta - \frac{mg\sin\theta}{2}$

$f_2 = \frac{mg\sin\theta}{2}$

$\boxed{\frac{f_1}{f_2} = 3}$