# YAKEEN NEET 2.0

2026

## Laws of motion

Laws of motion

PHYSICS | Lecture 16

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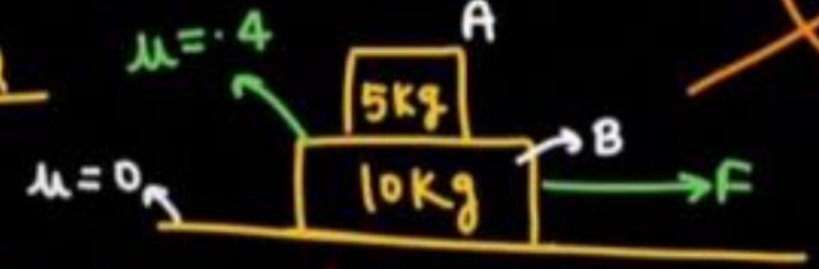
# Topics to be covered

1. Friction problem problem
2.
3.
4.

# Two Block Problem

Q

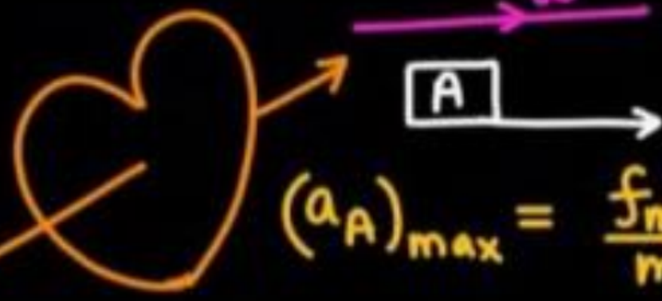



(a) Find max value of F so that Both block move together with same acc (without slipping)

Sol

Ans $F \leq 60$ साथ-साथ

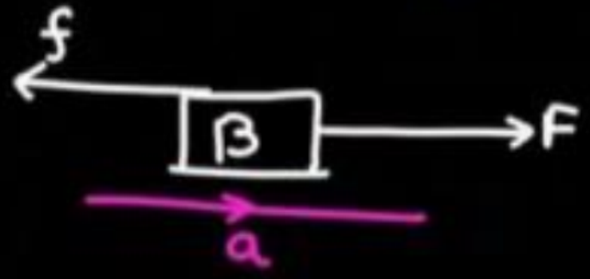
$F > 60$ अलग-अलग




$(f_s)_{max} = \mu N$

$= .4 \times 50 = 20$

$(a_A)_{max} = \frac{f_{max}}{m_A} = \frac{20}{5} = 4$



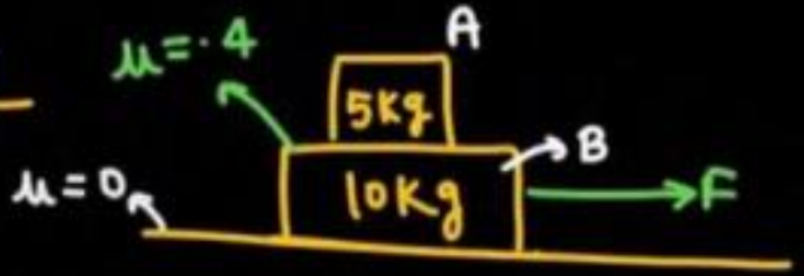

$(a_{commm})_{max} = 4$

or


$F = 15 \times 4 = 60$

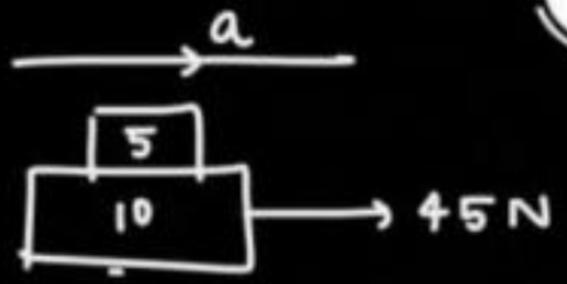
# Two Block Problem

Q




(b) If $F = 45N$

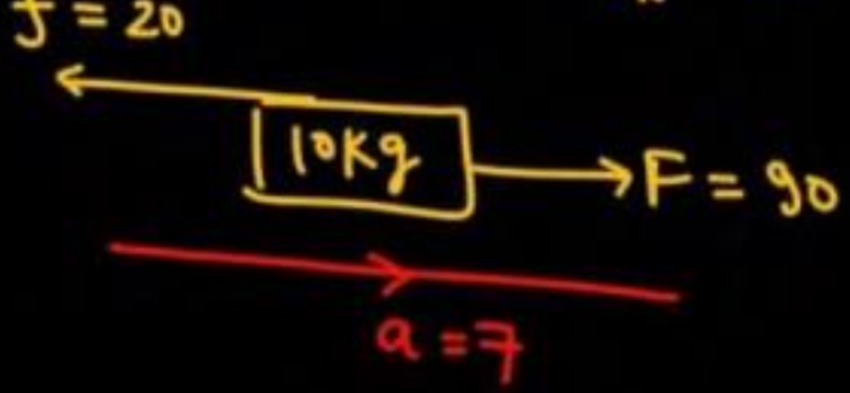
$$a_A = a_B = \frac{45}{15} = 3$$




(c) $F = 90\,N$ ≡ अलग


$f_k = 20$

$$a_1 = \frac{f}{m} = \frac{20}{5} = 4$$



$F_{max} \equiv a_1 = a_2 \Rightarrow$ ✓ साथ-साथ ✓

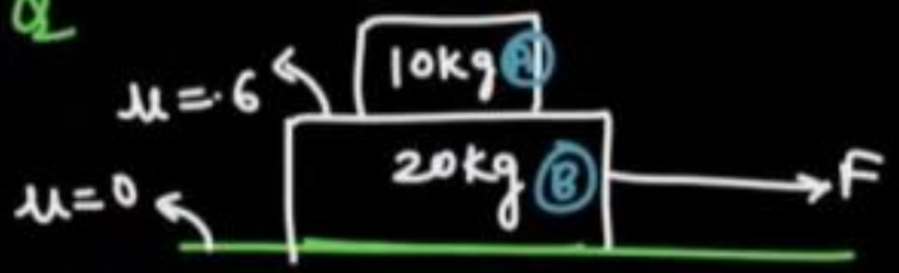
① $(f_s)_{max} =$ ✓

② $(a_{\text{मोहन}})_{max} = (a_{common})_{max}$ साथ-साथ

③ पूरे FBD ✓ $F_{net} = ma$ लगा दो

find $F_{max}$ so that both move together

Q




$(f_s)_{max} = .6 \times 100 = 60$

$(a_A)_{max} = \frac{60}{10} = 6 = (a_{common})_{max}$

$F = (10+20) \times 6$

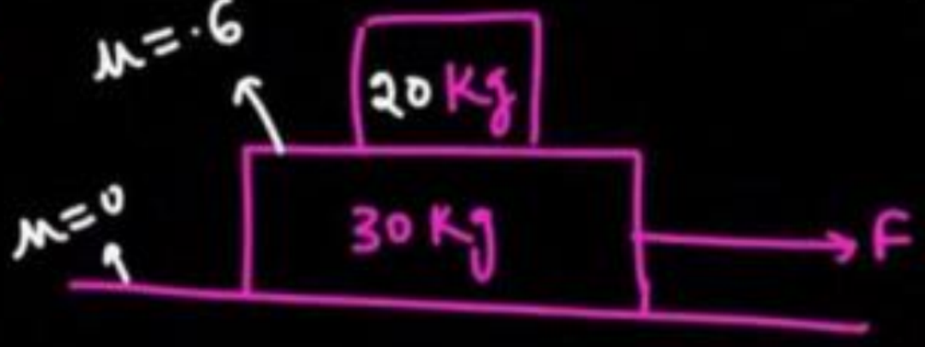
$F = 180\,N$

$F \leq 180$ $\quad a_1 = a_2$ together

$F > 180$ $\quad a_1 \neq a_2$, अलग-अलग Slipping

Repeat the last qun

Q



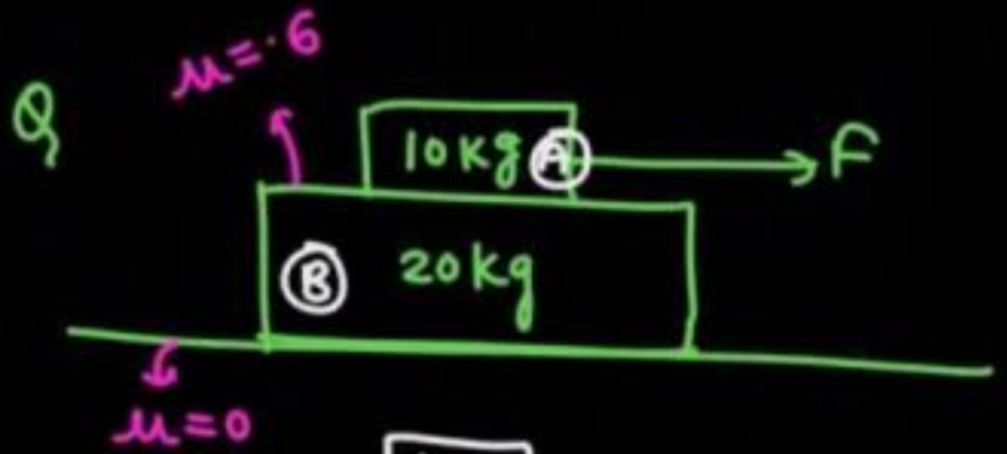

$F \leq 300$ साथ-साथ

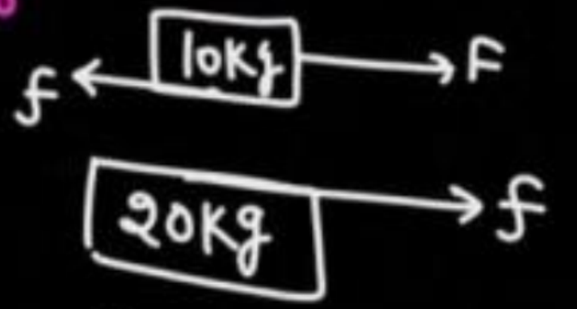
$F > 300$ अलग = 2

(b) If $F = 600\ N$


$a_1 = \frac{120}{20} = 6$


$a_2 = \frac{600 - 120}{30}$




$$(a_B)_{max} = \frac{f_{max}}{m_B}$$

find $f_{max}$ so that both move together

$$(f_s)_{max} = .6 \times 100 = 60$$

$$(a_B)_{max} = \frac{60}{20} = 3 = (a_{comm})_{max}$$

$$F = (10+20) \times 3 = 90$$

$F \leq 90$ together

$F > 90$ अलग-अलग

Q

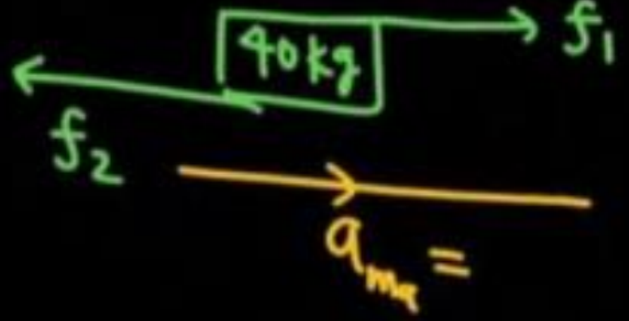

$(f_1)_{max} = .6 \times 200 = 120$

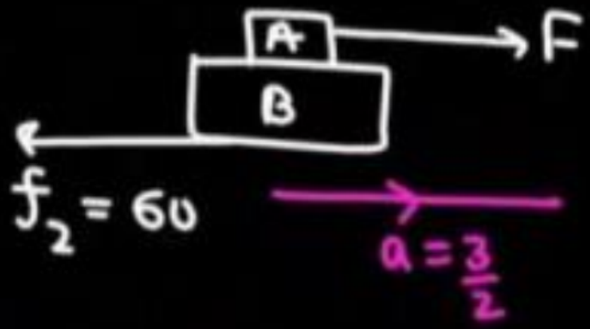
$(f_2)_{max} = \mu_2 N_{\text{जमीन}} = .1 \times 600 = 60$

$$(a_B)_{max} = \frac{(f_1)_{max} - f_2}{m} = \frac{120-60}{40}$$

$$= \frac{3}{2}$$

$a_{common} = \frac{3}{2}$


$F - 60 = 60 \times \frac{3}{2}$

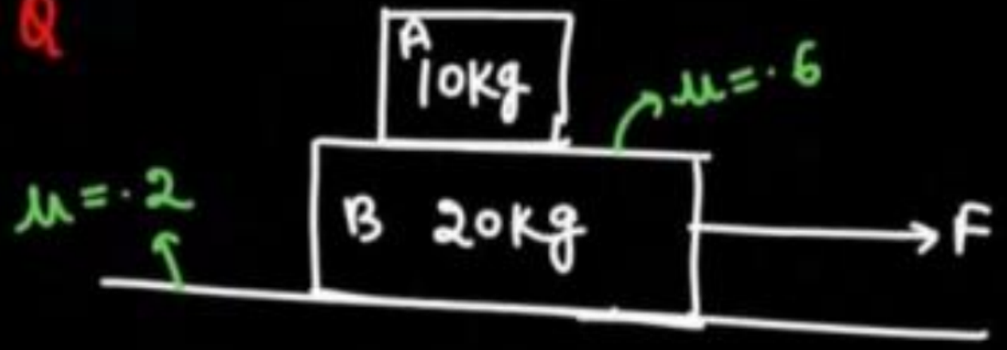
$F = 150$

$F \leq 60 \quad a_1 = a_2 = 0$

$60 < F \leq 150$ साथ-साथ

$F > 150$ अलग-अलग

Q

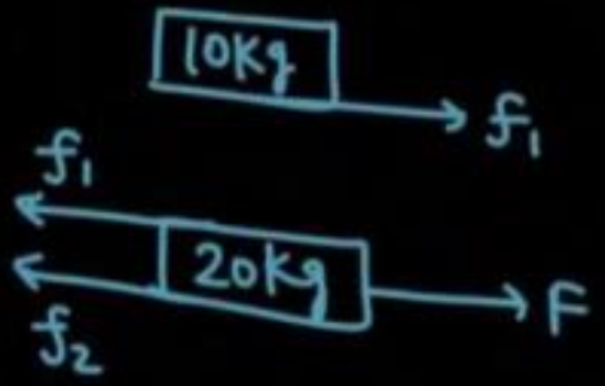



Rest

$F \leq 60$ $a_1 = a_2 = 0$

$60 < F \leq 240$ साथ - साथ

$F \geq 240$ अलग - अलग




$(a_A)_{max} = \frac{60}{10} = 6 = a_{common}$

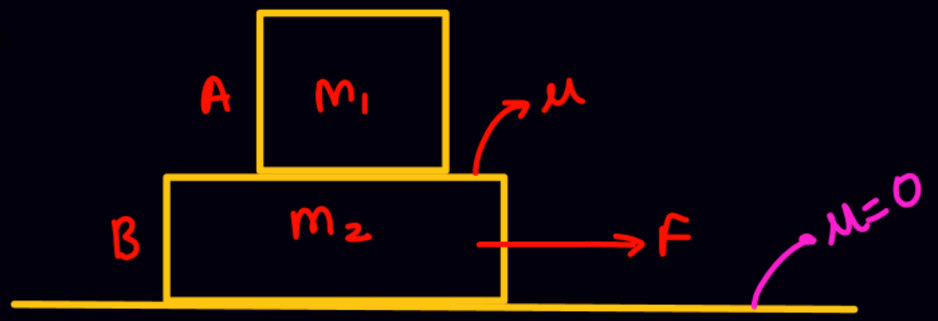
$F_{net} = m_{total}\, a_{com}$

$F - 60 = (10 + 20) \times 6$

$F = 240$

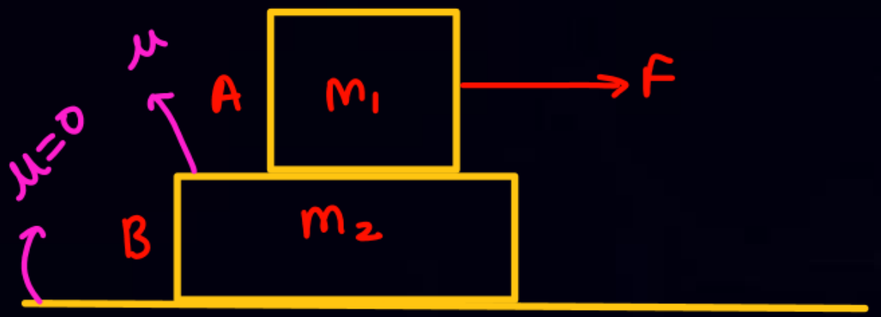
$(f_2)_K = .2 \times 300$

$= 60$



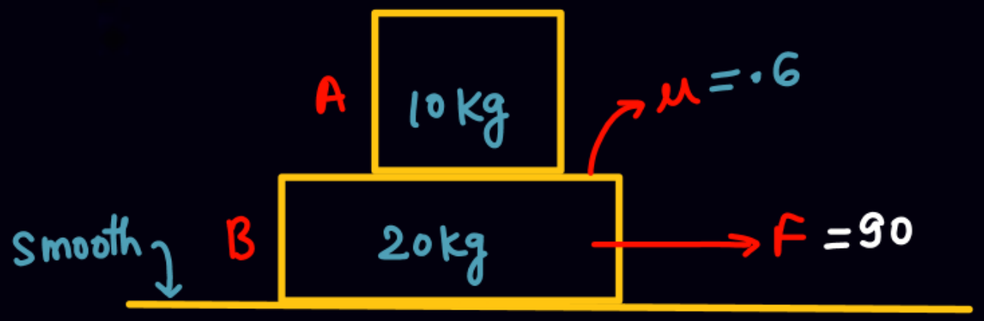

$$(a_A)_{max} = \mu_s g = (a_{common})_{max}$$

$$(F_{max})_{\text{for साथ-}\underline{2}} = (m_1+m_2)\mu g.$$




$$(a_B)_{max} = \frac{\mu m_1 g}{m_2} = (a_{comm})_{max} = a$$

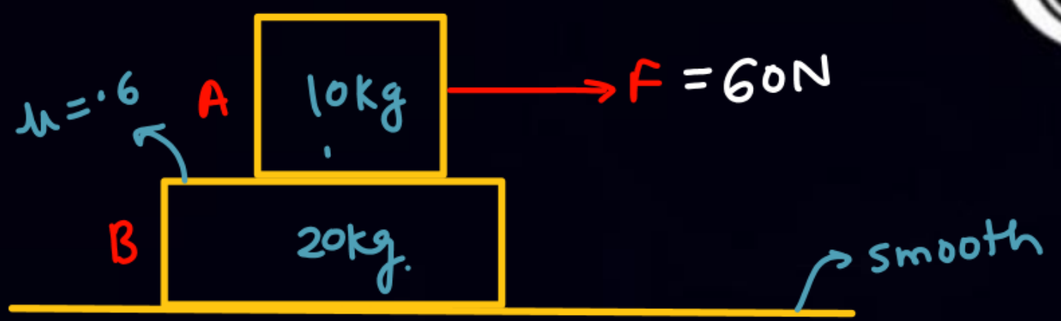
$$(F_{max})_{\text{साथ-}\underline{2}} = (m_1+m_2)\,a$$




$(F_{max})_{\text{साथ}} = 30 \times 6 = 180$

$a = \frac{90}{30} = 3$

$f = 10 \times 3 = 30$

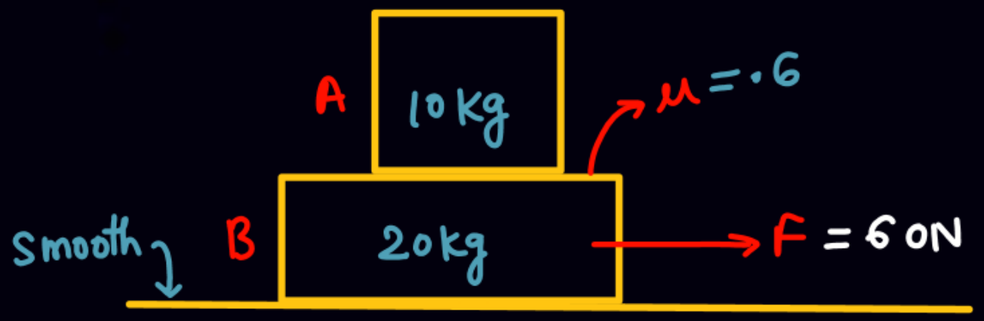



$a = \frac{.6 \times 100}{20} = 3$

$F = 30 \times 3 = 90 \Rightarrow$ (साथ-3)

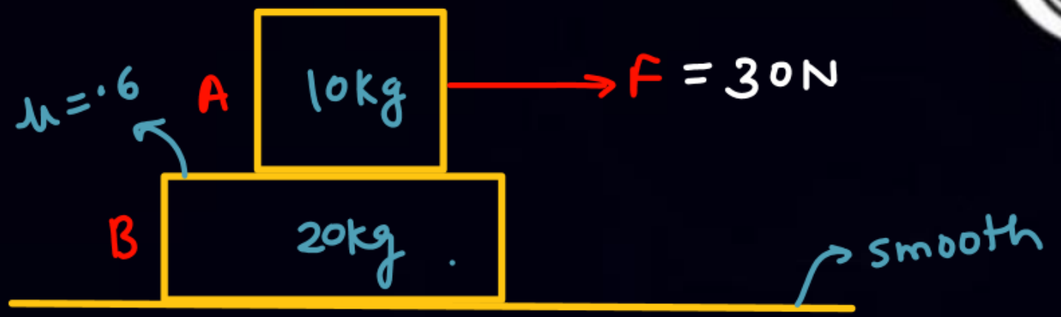
$a = \frac{60}{30} = 2$

$f = 20 \times 2 = 40$



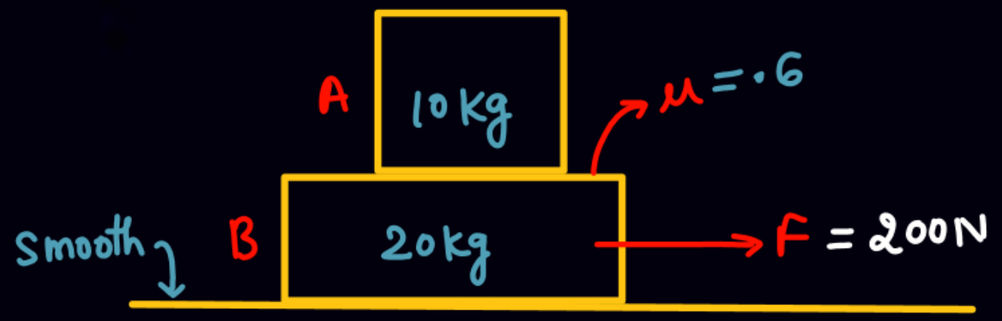

$a_1 = a_2 = 2$

$f_s = 10 \times 2$




$a = 1$

$f = 20 \times 1 = 20$




$a_1 \neq a_2$

$a_A = \mu g = 6$

$f = .6 \times 100 = 60$

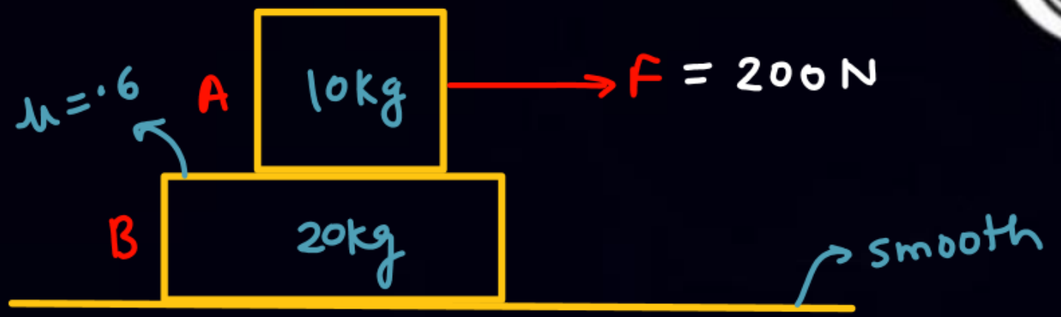

$200 - 60 = 20 \times a$

$a = 7$


$F = m_1a_1 + m_2a_2$

$200 = 10 \times 6 + 20 \times a_2$

$a_2 = 7$




$f = .6 \times 100 = 60$

$a_{नीचे} = \frac{60}{20} = 3$

$200 = 10a_1 + 20 \times 3$

$a_1 = 14$


$200 - 60 = 10 \times a$

$a = 14$

# THANK YOU