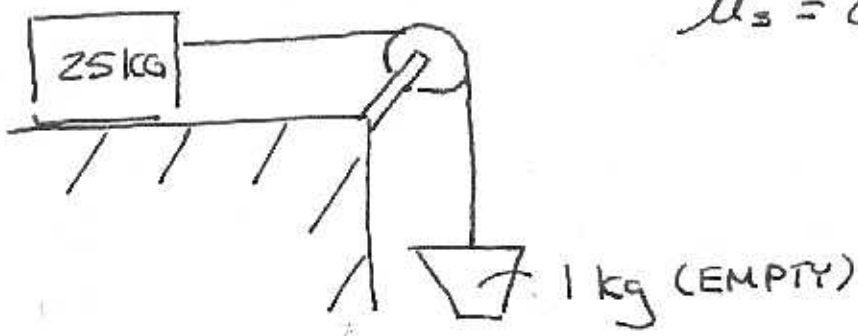


EVERYTHING "MKS!"



$\mu_s = 0.475$ } STATIC COEFFICIENT OF FRICTION

NOTE: WEIGHT of 25kg BOX = 245.25 N

FOR THE SOL PROBLEM of 03.01.07 WE CALCULATED THE TOTAL MASS of THE BUCKET WITH SAND TO BE 11.87 kg TO GET THE BUCKET TO "JUST START" TO BE MOVED. WITH A COEFFICIENT OF DYNAMIC FRICTION GIVEN TO BE 0.320 ($= \mu_D$) THE NEXT QUESTION WAS TO FIND THE ACCELERATION OF THE BOX & BUCKET ONCE IT STARTED TO MOVE.

LOOK AT THE BUCKET



$$W = mg = (11.87)(9.81) = 116.45 \text{ N}$$

$$\sum F_{sy} = ma$$

$$T - 116.45 = (11.87)(a) \leftarrow \text{EQ (1)}$$

NOW LOOK AT THE BOX



$$F_f = \mu F_N = (0.32)(245.25) = 78.48 \text{ N}$$

$$\sum F_{sx} = ma$$

$$T - 78.48 = (25)(a) \leftarrow \text{EQ (2)}$$

TWO EQUATIONS
TWO UNKNOWNS

SOLVE FOR T IN EQ (1)

$$T = -11.87a + 116.45$$

PLUG T INTO EQ (2)

$$[-11.87(a) + 116.45] - 78.48 = 25a$$

SOLVE FOR "a":

$$37.97 = 36.87a$$

$$\therefore a = 1.03 \text{ m/s}^2$$