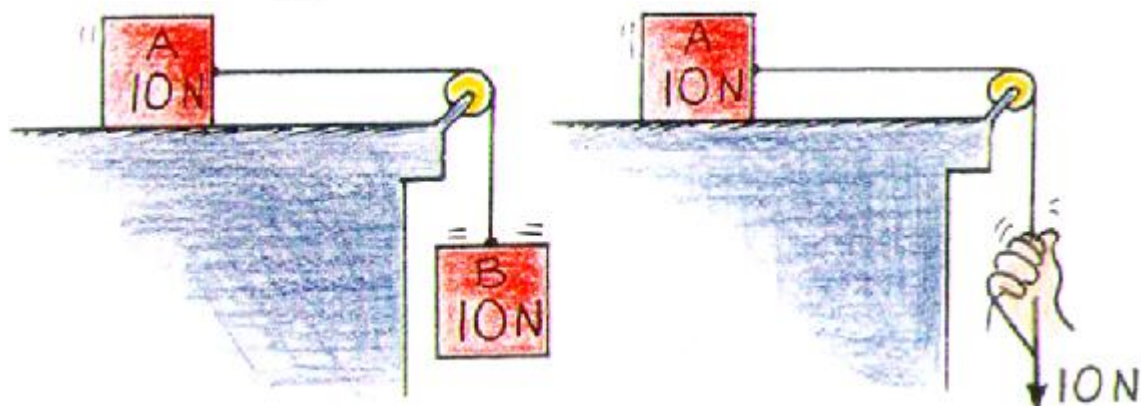


NEXT-TIME QUESTION



In both systems an applied force of 10 N causes Block A to accelerate. The acceleration of Block A is

- a) the same in both systems.
- b) greater in the one-block system.
- c) greater in the two-block system.

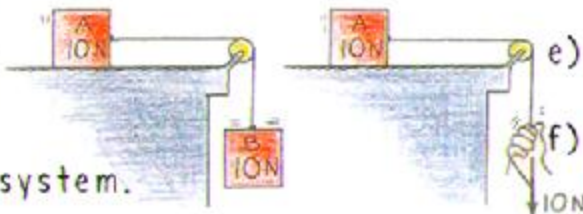
The tension in the string is

- d) the same in both systems.
- e) greater in the one-block system.
- f) greater in the two-block system.

NEXT-TIME QUESTION

In both systems an applied force of 10 N causes Block A to accelerate. The acceleration of Block A is

- a) the same in both systems.
- b) greater in the one-block system.
- c) greater in the two-block system.



The tension in the string is

- d) the same in both systems.

- e) greater in the one-block system.
- f) greater in the two-block system.

Answers: b, e

Although the applied force is the same in both systems, the mass being accelerated is different. In the single-block system, only Block A accelerates. In the two-block system, both Blocks A and B accelerate. Twice as much mass in the two-block system results in half as much acceleration. So acceleration is greater for the one-block system.

By Newton's second law, $a = \frac{F_{net}}{m}$, the same force acting on half the mass produces twice the acceleration.



String tension is 10 N in the one-block system—but not in the two-block system (if it were 10 N in the two-block system, F_{net} on hanging Block B would be zero—with *no* acceleration). Since acceleration of the two-block system is half, string tension in the two-block system is half.

Block A is pulled with 5 N of string tension.

