2018-Ph-H1-Q3

Section: Our Dynamic Universe
Topic: Forces, Energy and Power

Summary:
Two blocks (6.0 kg and 8.0 kg) are connected and pulled by a force of 32 N. Each block experiences 4.0 N of friction. The question asks for the acceleration of the 6.0 kg block.

Solution:

- Total mass:
$m = 6.0 + 8.0 = 14.0\,\text{kg}$

- Total friction:
$F_{\text{friction}} = 4.0 + 4.0 = 8.0\,\text{N}$

- Net force:
$F_{\text{net}} = 32 - 8 = 24\,\text{N}$

- Acceleration:
$a = \frac{F_{\text{net}}}{m} = \frac{24}{14} = 1.71\,\text{m/s}^2$

Answer: A. 1.7 m/s²

Guidance for Students:

- Combine the masses when the blocks are pulled together by the same force.
- Friction must be subtracted from the applied force to find net force.
- Apply Newton's second law $F = ma$ to the total system.

Revision Tips:

- **Add all frictional forces.**
- **Check total mass** if blocks are linked and accelerate together.
- **Direction matters**, but magnitudes of force can be treated as scalars in this case.