Question#18437

A pulley system with 76% efficiency is set up to lift a 18kg bag of nails. The bag is lifted to a height of 2.1m by a person pulling on the rope with a force of 58.0N.

1) What is the work done on the bag of nails by the pulley?

2) How much work is input to the system?

Solution:

Let:

$m = 18\ kg$

$H = 2.1\ m$

$k = 76\% = 0.76$

$A(pulley) - ?$

$A(input) - ?$

$$A(pulley) = FH = mgH = 18 * 9.8 * 2.1 = 370.44\ J$$

$$A(input) = \frac{A(pulley)}{k} = \frac{370.44}{0.76} = 487.42\ J$$

Answer: the work by the pulley is 370.44 J, the work input to the system is 487.42 J

http://www.AssignmentExpert.com