Answer on question #61332, Physics, Electromagnetism

The electric potential difference between two points A and B is 42 V. What is the work done by an external agent in carrying a charge of 5.0×10−5C from A to B at constant speed?

a) 2.1×10−3J
b) 8.4×10−4J
c) 21×10−4J
d) 8.4×10−3J

Solution:

By definition, the electric potential difference is the difference in electric potential (V) between the final and the initial location when work is done upon a charge to change its potential energy. In equation form, the electric potential difference is

$$\Delta U = \frac{A}{q}$$

Therefore,

$$A = \Delta U q$$

$$A = 42 \cdot 5.0 \cdot 10^{-5} = 2.1 \cdot 10^{-3} J$$

Answer: a) 2.1×10−3J