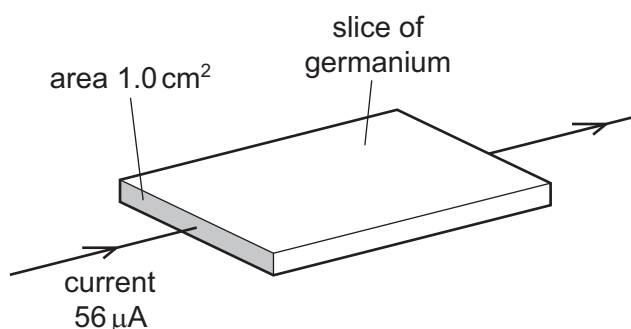


29 What is a possible charge on a particle?

- A $6.40 \times 10^{-20} \text{ C}$
- B $4.00 \times 10^{-19} \text{ C}$
- C $1.12 \times 10^{-18} \text{ C}$
- D $9.11 \times 10^{-18} \text{ C}$

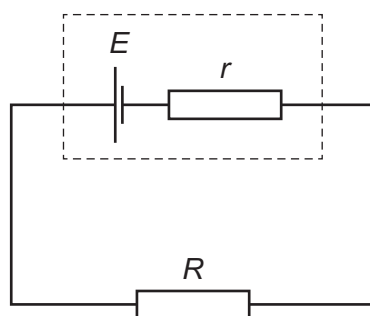
30 A slice of germanium of cross-sectional area 1.0 cm^2 carries a current of $56 \mu\text{A}$. The number density of charge carriers in the germanium is $2.0 \times 10^{13} \text{ cm}^{-3}$. Each charge carrier has a charge equal to the charge on an electron.



What is the average drift velocity of the charge carriers in the germanium?

- A 0.18 ms^{-1}
- B 18 ms^{-1}
- C 180 ms^{-1}
- D 1800 ms^{-1}

31 A cell of electromotive force (e.m.f.) E and internal resistance r is connected to an external resistor of resistance R , as shown.



What is the power dissipated in the external resistor?

- A $\frac{E^2(R+r)}{R^2}$
- B $\frac{E^2 R}{(R+r)^2}$
- C $\frac{E^2(R+r)}{r^2}$
- D $\frac{E^2 r}{(R+r)^2}$