

Numbers in italics refer to the Exercise number in the 12th Edition of Young & Freedman's "University Physics". Answers to odd-numbered questions are at the back of the book.

- [25.2] A silver wire 2.6 mm in diameter transfers a charge of 420 C in 80 min. Silver contains  $5.8 \times 10^{28}$  free electrons per cubic metre. a) What is the current in the wire? b) What is the magnitude of the drift velocity of the electrons in the wire? c) Given that the resistivity of silver is  $1.47 \times 10^{-8} \Omega\text{m}$ , if the wire is 1 m long what is the voltage difference between the two ends?
- [25.29] A strand of wire has resistance  $5.6 \mu\Omega$ . Find the net resistance of 120 such strands if they are (a) placed side by side to form a cable of the same length as a single strand, and (b) connected end to end to form a wire 120 times as long as a single strand.

Some possibly useful information and formulae:

$j = nqv_d$	Symbol	Value	Units
$j = E/\eta$	$\epsilon_0$	$8.85 \times 10^{-12}$	$\text{C}^2/\text{N m}^2$
	$1/4\pi\epsilon_0$	$8.99 \times 10^9$	$\text{N m}^2/\text{C}^2$
	$m_e$	$9.11 \times 10^{-31}$	kg
	$e$	$1.60 \times 10^{-19}$	C