## Fundamental Constants

| Symbol | Quantity | Established value | Value used for calculations in this book |
|---|---|---|---|
| $c$ | speed of light in a vacuum | 299 792 458 m/s | $3.00 \times 10^{8}$ m/s |
| $e^-$ | elementary charge | $1.602\ 176\ 53 \times 10^{-19}$ C | $1.60 \times 10^{-19}$ C |
| $e^1$ | base of natural logarithms | 2.718 2818 28 | 2.72 |
| $\varepsilon_0$ | (Greek *epsilon*) permittivity of a vacuum | $8.854\ 187\ 817 \times 10^{-12}$ C$^2$/(N•m$^2$) | $8.85 \times 10^{-12}$ C$^2$/(N•m$^2$) |
| $G$ | constant of universal gravitation | $6.672\ 59 \times 10^{-11}$ N•m$^2$/kg$^2$ | $6.673 \times 10^{-11}$ N•m$^2$/kg$^2$ |
| $g$ | free-fall acceleration at Earth's surface | 9.806 65 m/s$^2$ | 9.81 m/s$^2$ |
| $h$ | Planck's constant | $6.626\ 0693 \times 10^{-34}$ J•s | $6.63 \times 10^{-34}$ J•s |
| $k_B$ | Boltzmann's constant ($R/N_A$) | $1.380\ 6505 \times 10^{-23}$ J/K | $1.38 \times 10^{-23}$ J/K |
| $k_C$ | Coulomb constant | $8.987\ 551\ 787 \times 10^{9}$ N•m$^2$/C$^2$ | $8.99 \times 10^{9}$ N•m$^2$/C$^2$ |
| $R$ | molar (universal) gas constant | 8.314 472 J/(mol•K) | 8.31 J/(mol•K) |
| $\pi$ | (Greek *pi*) ratio of the circumference to the diameter of a circle | 3.141 592 654 | calculator value |