

Preface to the Student's Solutions Manual

For the sixth edition of **Concepts of Modern Physics**, most problem solutions have not changed substantially. Several considerations that have been made reflect a further trend towards greater use of more sophisticated calculational techniques, from more elaborate handheld devices to symbolic manipulation and graphing software. None of the problems or exercises in the text require powerful tools, but it is expected that those with access to these tools will be inclined to use them. When such methods might be advantageous for specific problems, the solution to those problems try to identify the methods.

With few exceptions, the values of physical constants used are from the front endpapers or the Appendix of atomic masses. In doing the calculations for this solutions manual, extra significant figures were retained in intermediate calculations, and the answers rounded to the appropriate number of significant figures. For several of the problems, additional features have been used as alternatives.

- **Reference to Other Sources** has been kept to a minimum; the text itself contains all of the information needed. If values of physical constants are desired to better accuracy, a suggested source is the **Particle Data Group** tables of **Constants, Units, Atomic and Nuclear Properties**, available at

http://pdg.lbl.gov/2001/contents_sports.html

- **Plotting and Analysis of Data** problems were done using a spreadsheet program, primarily for the convenience of obtaining legible plots. The text problems that do require fits to data sets can be done to the desired precision by hand-graphing, and those with statistics capabilities on handheld calculators will be able to find least-squares best-fit linear fits to the desired precision.

- **Symbolic Manipulation and Graphics Programs** make some problems simpler, but are not required for any specific problem. For some problem solutions, examples of commands that will run on most releases of MAPLE are given.

- **Special Methods of Integration** are given for some problems, including numerical integration of functions that would otherwise rely on judicious approximation. The special analytic methods given are mainly for finding moments of distributions, using techniques familiar to physicists.

- **Numerical Approximations** for some problems requiring a high degree of precision are available in some circumstances; when these methods are included, the

analytic approximations, usually involving Taylor Series, are intended as the primary method of solution.

Mistakes and transcription errors may be reduced but are unlikely to be eliminated. All problems have been rechecked from the fifth edition, and many (too many, of course) errors have been corrected. “Solutions” to the shorter odd-numbered discussion-type questions do not differ substantially from the answers at the back of the text. Any corrections or suggestions for improvements will be appreciated.

Thanks to Professor Beiser for cross-checking the rough answers, and many thanks to the folks at the **Experimental Study Group** at **MIT** for their help, advice and patience.

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