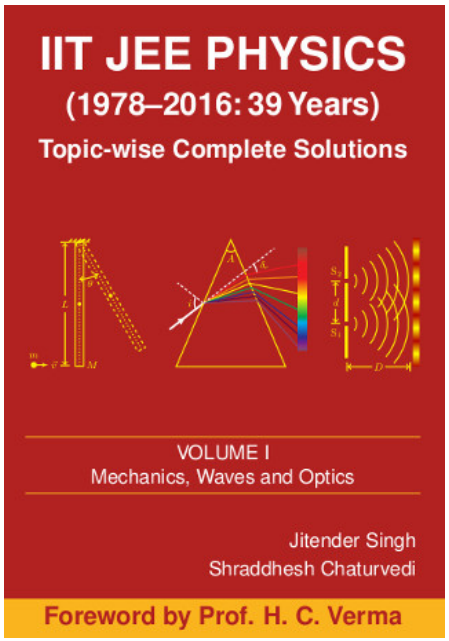
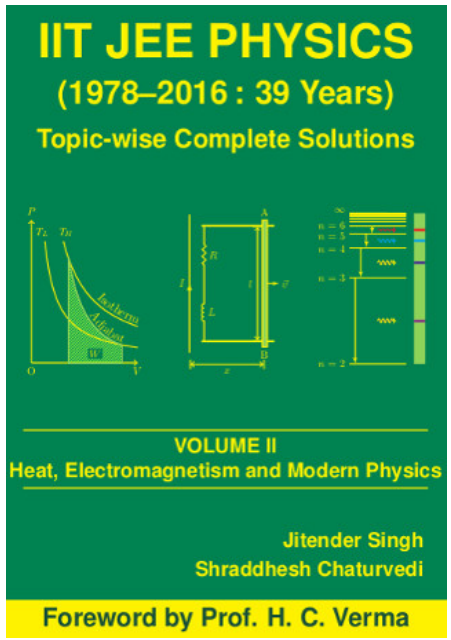
IIT JEE Physics (1978–2016: 39 Years)

Topic-wise Complete Solutions





Who are We?

Jitender Singh

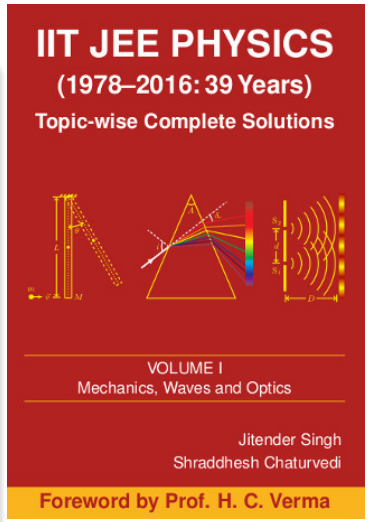
Shraddhesh Chaturvedi

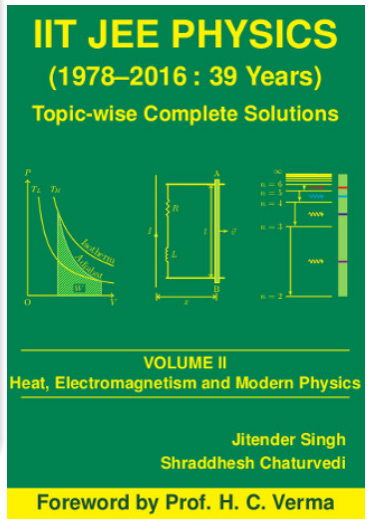
Prof. H.C. Verma

The Authors, Jitender Singh and Shraddhesh Chaturvedi, are IITians with a degree in Integrated M. Sc. (5 Years) in Physics from IIT Kanpur. Both have more than a decade of experience in Industry. They loves to solve physics problems and are dedicated to improve quality of physics education in the country. This work was inspired and guided by Prof HC Verma of IIT Kanpur, who was kind enough to write foreword for the book.

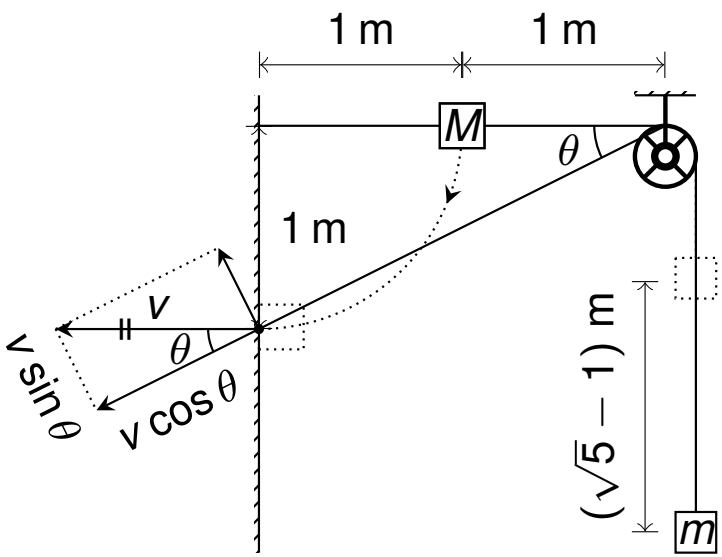
Key Features of the Book

- Focus on building concepts through problem solving
- Comprehensive collection of question from past 39 years of IIT JEE (more than 1350 questions)
- Correct and complete solutions
- Topic-wise arrangement of questions
- Year-wise sorting of problems on each topic
- Categorisation of question according to its type
- High quality of figures and mathematical typesetting
- Leads to extend questions for further learning
- Simple language and highly readers friendly





Correct and Beautiful Graphics



- Figures are Correct, Includes all Detail and Look Beautiful.
- Correct Shapes Generated through Exact Angles and Length Ratios.
- Necessary Details like Axes, Label, Annotations, and Mathematical Symbols using TEX and PGF.
- Controlled to the Minutest Level.
- Figure Placement on the Side of Text for Easy Reference.

Mathematical Symbols and Equations

Net force on this element, $\mathrm{d}F$, provides centripetal acceleration to it i.e.,

$$\mathrm{d}F = m\omega^2 x = \frac{M\omega^2}{L} x\,\mathrm{d}x. \qquad (1)$$

Integrate equation (1) from $x = 0$ to $x = L$ to get the force at the right end

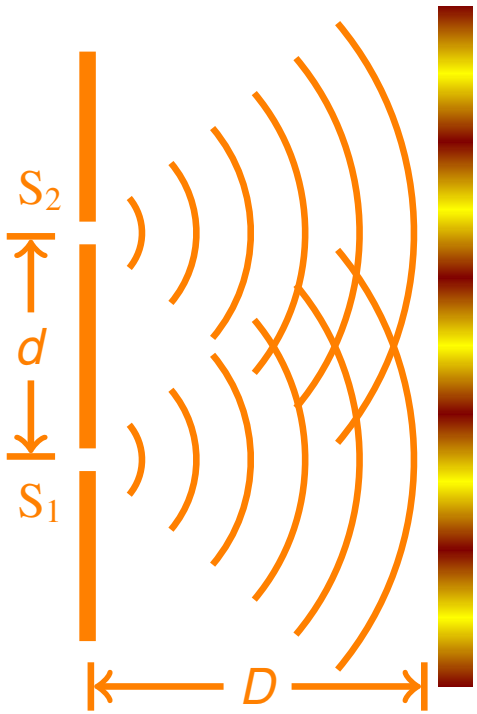
$$F = \frac{M\omega^2}{L}\int_0^L x\,\mathrm{d}x = \frac{M\omega^2 L}{2}. \qquad (2)$$

This is radially inward force on the liquid.

- Religiously Followed the Rules and Conventions set by Mathematicians.
- Even Trivial Things are Taken Care e.g., $\hat{i} \neq \hat{\imath}$.
- Equations are Numbered and Correctly Referenced.
- Exploited TEX Typesetting System and its Extensions for Beautiful Mathematics.

Focus is on the Concepts

- Our philosophy is to use correct physics to get the correct answer
- Identified the critical points in each problem
- The laws used to solve the problem are clearly mentioned
- The pre-conditions for conservation laws are verified before using them
- If a student seriously attempts the problems in this book, he/she will naturally develop the ability to analyze and solve complex problems in a simple and logical manner using a few, well-understood principles.

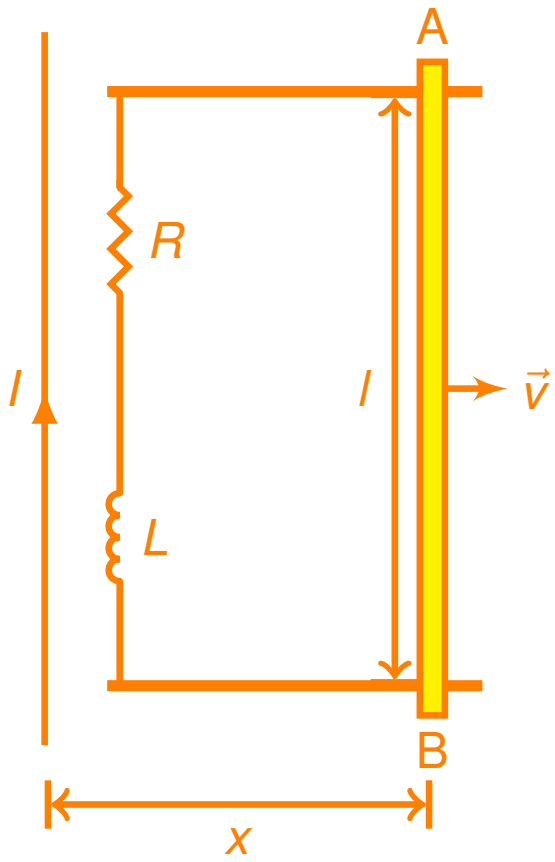


Getting the Answer is Not the End

- You will find a large number of solution ending with something like this:

  The readers are encouraged to apply the gravitational Gauss's law, $\oint \vec{E} \cdot \mathrm{d}\vec{s} = -4\pi G M_{\text{enc}}$, to find the gravitational field and potential in symmetrical problems like sphere, shell, cylinder etc.

- These are leads to explore more challenging and interesting physics. We believe that learning should not stop at the answer.
- A clear understanding of the concepts and their application to solve complex problems is the key to success.



Book Organization: We care for the students

IIT JEE preparation should be seamlessly integrated with school education. We made an effort in this direction by,

- Topic-wise arrangement of questions in different chapters.
- The questions based on multiple topic are put in later chapters
- The question of different type are arranged in separate sections
- In each section, questions are arranged year-wise (in descending order)
- We organize the book from the student's perspective