

PREAMBLE

Heat and thermodynamics has departure from mechanics in the sense that it's study is based on inferences of observations, while in mechanics study is based on observations. In this pursuit Kinetic Theory of Gases (KTG) is first step to relate observed behavior of gases from internal dynamics of gases. Thus KTG sets a tone for inferential analysis of observations, which keeps growing as journey into physics proceeds into those areas where even direct observations are not possible.

Any understanding of theory is useful in problem solving only when it is followed by rigorous practice in solving problems of verities involving various concepts. In this connection there are various test books and question banks available at book stores. Yet books by Resnick-Halliday-&-Krane and H.C. Verma are placed at the highest choice. This choice is not by any other consideration except that the authors have formulated problems so nicely that taking any of two books would give a good spectrum of problems with increasing complexity and involving all concepts on the chapter and integration of concepts studied earlier. Questions from various examination and competitions are abrupt and may involve integration of all concepts from the syllabus, and at the level of competition being targeted. It is, therefore, appropriate to practice such questions only when problems from such text books have been practiced.

It may not be out of place to place on record that *solving any problem is simpler than formulating the problem*. In light of this efforts of the authors in writing book and supplementing it with question bank is highly revered. In view of this, in the supplement to Mentors' Manual while preference is given to the books, question bank in the book by H.C. Verma, has been preferred here. It covers Objective Questions (both SCQ and MCQ) together with exercises. This is being supplemented with questions from other sources as we go forward.

It is a common experience that the web resource has been so much enriched that it is a matter of posing a problem and solution is available either free or some on price. Here, it is pertinent to emphasize that web resource is meant to reach students who are not able to connect the solution provider. While, students from deprived section of society may find it difficult to always make sense with the available web solution. In view of this question banks are supplement with illustration. The illustrations are attempts to start from first principle, to the possible extent, with special note wherever necessary. This whole initiative is aimed at to connect students who are otherwise disconnected, and make it explicit to the possible extent so that they can use it independently.

In this methodology, uniformly adopted to objective and subjective questions, students may find some basic concepts or equations being referred to time and again in illustrations. It is generally seen that most of the solutions available user is presumed to be aware of the concepts. This does help in making solution crisp and direct. It is advised that students attempt questions and match their answer. In case of mismatch in their answer, they are advised retry questions encountered with their incorrect answers. Only in the event of mismatch on second attempt, they may refer to the illustration. It is likely that students who are well versed with concept would need to refer to illustration to some random problems. Thus illustration so made will not discomfort such students. *Student who finds themselves comfortable with questions and answers, they deserve to be complemented*. Yet, if they at all choose to refer to illustrations, they are advised to bear with repetition of concepts for those students who did not have grooming at their level. This will enrich in them a sensible human sensitivity as much as complement this initiative.

Practicing of problems at times involves numerical skills and handling of data in different system of units. This requires care and clarity of variables and associated units for correctness and speed; it is a necessity for success in examination. It is advised that during solution, students stick to one system of units, preferably SI, and convert the given data into it wherever necessary. It facilitates burden of remembering standard values in different system of units. This approach may take some extra efforts, yet it would certainly avert possibility of errors. Loss of an error is much bigger due to negative marking.

This initiative is aimed at to mentor unprivileged children is being pursued by a small group of passionate persons is driven with a sense of Personal Social Responsibility (PSR) in a non-organizational, non-remunerative, non-commercial and non-political manner. Teachers, mentors, students and professionals are welcome to add value to this initiative by way of suggestion, advising correction or new type of questions. They are also welcome to choose any other form of support which suits to their passion, experience, expertise and convenience.