

## PREAMBLE

*Beginning of inferential analysis of observations in Kinetic Theory of Gases (KTG), a part of chapter on Heat application of the concepts is a logical consequence of the journey in the physics. Calorimetry and Thermodynamics are the two important chapter. Accordingly, in this set of questions, problems are taken up with their illustrations.*

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 first choice for a systematic growth of excellence. 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 are graded with increasing complexity, as one proceeds with them. They involve different concepts on the chapter and integration of concepts studied earlier. As against this questions from various examination and competitions are abrupt 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 context to place on record that *solving any toughest problem is simpler than formulating a 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 taken to start with. It covers Objective Questions (both SCQ and MCQ) together with exercises. Going forward this is being supplemented with questions from other sources also.

It is a common experience that the web resource has been so much enriched that it is just 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 supplemented with illustrations. The illustrations are tend to start from first principle, to the possible extent, with special note wherever necessary. This is expected to be useful who never had an opportunity to be attached to passionate mentors. Since each illustration is handled as an independent difficulty of a student or user repetition of steps is unavoidable. This is in line with the objective of this to reach out to students who are otherwise disconnected and struggling in their journey of excellence.

Students are advised to revise basics before attempting question bank. It is advised to attempt them under examination conditions to gain proficiency in terms of accuracy and speed. In case of mismatch of answers, students are advised to retry problems after revisiting concepts. Despite, if difficulty exists the illustrations may be referred and then problem may be attempted independently. After successfully attempting question bank, students may like to refer to illustrations for appreciating nuances of concepts.

Elaboration of concepts and calculations at times might be found too trivial. Yet students are advised to start with it. Gradually as students attain proficiency in applying concepts and handling long calculations crisp steps and calculations will evolve automatically without being conscious of it. As regards brilliant students, teachers and professionals may like to pick up random illustrations or those of problems encountered with mismatch of answers. They would find the approach in illustrations worth refreshing the concepts for themselves. In case they wish to add value to illustrations by ambiguities, if found, typographical

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 their units for correctness and speed; it is a necessity for success in examination. It is also 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.

A small group of passionate persons are engaged in this initiative to mentor unprivileged children so as to groom competence to compete among them. This is driven with a sense of Personal Social Responsibility (PSR). It is a non-organizational, non-remunerative, non-commercial and non-political manner. Teachers, mentors, students and professionals who can collectively complement the efforts to the extent it is possible and it suits to their passion, experience, expertise and convenience, are gratefully welcomed.