

**PREAMBLE**

*Specific Heat of Gases is very special section of Heat and Thermodynamics. Compressibility of gases and the process that it undergoes under varying pressure and volume, both or only one of them affects thermal properties of gases and in turn its specific heat. This section involves concepts of everything learnt in heat and thermodynamics together with mechanics. Thus it is a good drill into the integrated assimilation of the subject matter. Accordingly, in this set of questions, problems are taken up with their illustrations from the Chapter 27, Vol II, Concepts of Physics, a book by Prof. H.C. Verma.*

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 questions from different sources 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 initial preference is given to the by H.C. Verma. It covers Objective Questions (both SCQ and MCQ) together with exercises. Going forward this is to be supplemented with questions from other sources also.

It is a common experience that a rich web resource is available on a wide spectrum. 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 a sense with the available web solution. Moreover, there are multiple solutions, videos and/or responses to each quarry on web. This makes it difficult for students to choose what to bank upon in his pursuit of learning. In view of this question banks for the students that we target are supplemented with illustrations. The illustrations to start from first principle, to the possible extent, with special note wherever necessary. This is expected to be useful to those students who never had an opportunity to learn from passionate mentors. Since each illustration is handled as an independent difficulty of a student or user repetition of steps is unavoidable. In illustrations figures wherever necessary for elaborations have been used, else student is supposed to use figure given in the problem supposed to be readily available with him while referring to the illustration.

Students are advised to revise basics before attempting question bank under examination conditions. It will help 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 again the problem may be attempted independently. After successfully attempting question bank, students may like to refer to illustrations for appreciating nuances of concepts.

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 pointing out ambiguities and typographical errors, they are gratefully welcome.

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 and loss 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.