How To Prepare For IIT-JEE

Start by doing what is required, then do what is possible and you will realise that you have done the impossible.

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IIT-JEE remains one of the toughest examinations conducted at the Plus-2 level by far. The toughness of this exam is felt more because of the competition than its syllabus content. If the hard work for JEE is done in a systematic and tactful manner, then the success in IIT-JEE is sure.

For this year, the IIT-JEE will be held on April 12, 2009 and is going to be on the pattern similar to the 2008 IIT-JEE, i.e. objective type. There will be two papers of three-hour duration each. As both papers will test areas of Physics, Chemistry and Mathematics, students who do not do well in a particular subject in the first paper can improve their score in the second one. In short, all candidates get a second chance to cover up. Also, since the pattern of questions is similar in the second paper, the chances of scoring high go up.

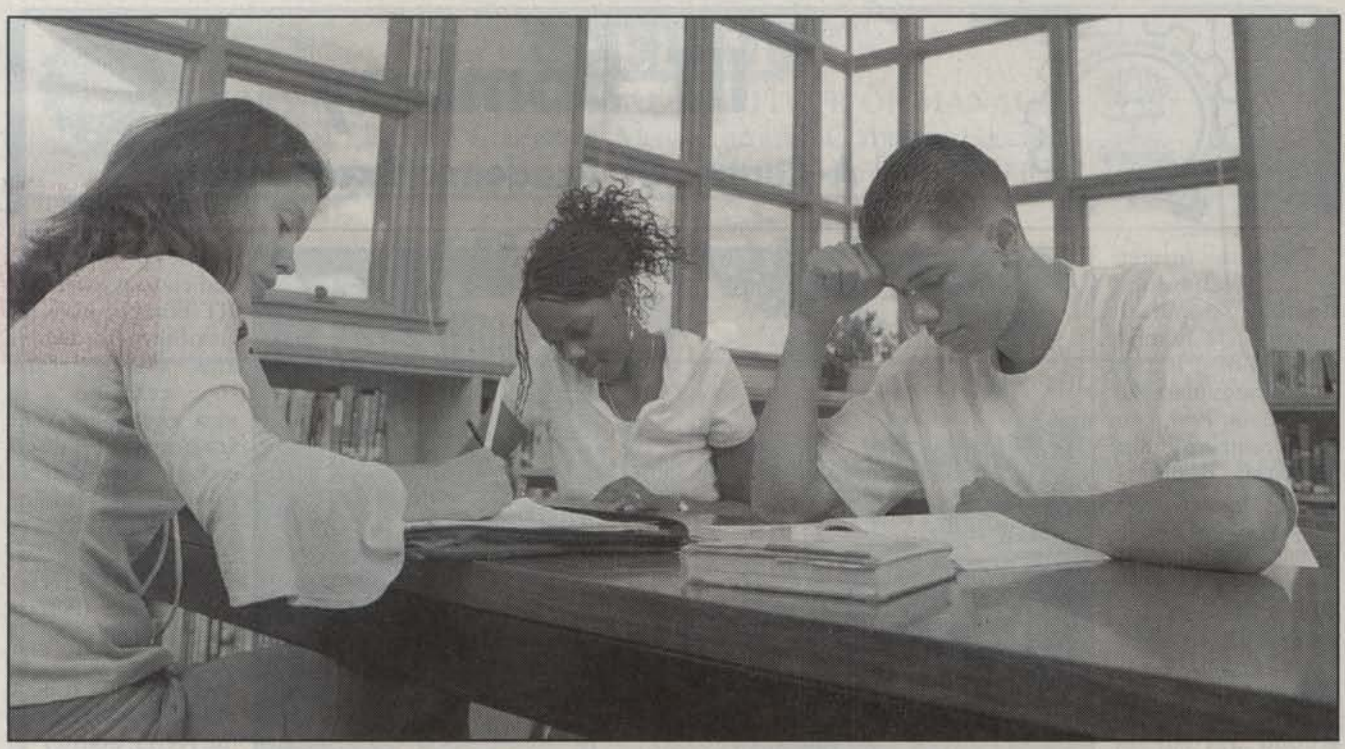
To be successful in the JEE, a student should first master the fundamentals of Class 11th and 12th syllabus, followed by attempts to get into the depth of the subject by solving relevant short but twisted problems from various text books.

Unlike exams like AIEEE, where it is enough for the student to know which answer, among the four choices, is correct, the IIT-JEE expects a student to know why the remaining three choices are incorrect. This may seem obvious and simple but to master this difference in preparation approach makes the whole difference. For example, the comprehension type questions asked in IIT-JEE demand a more thorough understanding of the questions compared to other exams like AIEEE and State CETs. So a true aspirant for JEE must emphasise on honing his/her comprehension and analytical abilities.

In this article, we will discuss some of the key areas and topics in Physics, Chemistry and Mathematics where emphasis should be laid. Choosing the right topics for maximum hard work and study is very important not only for clearing JEE but also for getting a higher rank. Lots of topics in JEE syllabus require a lot of time as compared to some of the other topics. Spending too much time on topics which may also have less likelihood of coming in the exam can lead to drastic failure in rank or, for that matter, in selection of the candidate. Lots of topics in JEE are very easy and are of NCERT level. The key to topping JEE is to maximise your scoring in these topics which boosts the rank. Many such topics require considerably less time and are much less than the time required by certain other topics with proportionate marks. You should spend more time on these topics and try to earn full marks in such topics. Some of such easier topics in Physics for JEE include Modern Physics & Optics, where most of the questions asked are easy and are similar to past JEE questions. Similarly in the subject of Chemistry, the questions asked in Inorganic Chemistry, General Chemistry and Solid State are mostly of NCERT level and simple. In Mathematics, the questions asked on topics such as Probability, Differentiation and Differential Equations are most simple and a student can expect easier level of problems in the JEE.

Spending good time on these topics can help a student score well in JEE. However, this does not mean that other topics should be neglected. Since, unlike other entrance exams, in JEE the questions are asked on multiple concepts, the student should not depend on his/her ability or knowledge on specific topics independently. A student needs to get out of the compartment mode of thinking and look for applicability of concepts across subject areas. For example, in this article in Physics, we will focus on the Mechanics portion. The Mechanics broadly constitutes of three units i.e. Unit-I containing "Kinematics", Unit-2 containing "Laws of Motion & Work-Energy-Power" and Unit-3 containing "Centre of Mass, Collisions & Rotational Motion". The study of Unit-1 should be limited to solving objective type questions. The basic concepts used in entire Mechanics, better to say, in entire Physics lie in Unit-2 i.e. Laws of motion and Work-Energy-Power. On the other hand, the Unit-3 is application of all that has been learnt in Unit 1 & 2. Subjective type problems based on Unit-3 should also be solved.

Secondly, a student should also realise that the same concept may be present in each of the five topics, viz., Motion in one dimension, Motion in two dimensions,



Work Energy Power, Rotational Dynamics and Laws of Motion. Which means that the student should be able to use one concept in different areas to get these types of 'Match the following' questions. This is exactly what the JEE intends to seek in young aspirants—can you 'size up the situation'?

Moreover, in Mechanics, on a specific topic-wise analysis, special stress should be given to three conservation laws viz. Conservation of mechanical energy, Conservation of linear momentum and Conservation of angular momentum.

In Chemistry, we will take up the Physical Chemistry part in this article. It is a known fact that Physical Chemistry holds an important role in preparation of competitive entrance examinations. If the basic concepts in Physical Chemistry are clear, then, one can be assured of scoring high in Chemistry.

For the IIT-JEE 2009, one can expect a comprehension type of questions from topics like Electrochemistry, Thermodynamics and Gaseous State. Topics such as Solid State, Solutions, Atomic Structure, Equilibrium and Chemical Kinetics may throw a couple of MCQ pattern questions. As far as questions on Assertion & Reason type are concerned, one can expect it from Surface Chemistry. Similarly, for Matrix-match type of questions, one must not leave topics like Azeotropic mixtures or Crystal systems.

Overall, 35% to 40% questions asked in entrance exams shall be from Physical Chemistry. A good performance of a student in Physical Chemistry not only helps a student in securing his/her admission in IITs but also gives a competitive advantage over others, thereby boosting the rank. High performance in Physical Chemistry is correlated with a student's prowess in Mathematics. Therefore, a good student with a good score in Mathematics and Physics can definitely improve his rank by scoring in Physical Chemistry.

Similarly, in Mathematics, we will discuss the Algebra & Trigonometry part in this article. Mathematics is at the heart of any competitive exam and thus it is of prime importance. To excel in exams like JEE, a student should concentrate on 4 C's of Mathematics, i.e. Complex Numbers, Combinatorics (which include portion of Algebra), Coordinate Geometry and Calculus. These 4 C's cover approximately 80% to 85% of the questions asked in competitive examination.

In complex numbers, students should concentrate on the concept of roots, and problems based on locus. The beauty of this chapter is that by simple effort aspirants can solve problems of these chapters with ease and are able to augment their scores. In IIT-JEE 2009, one objective question and one comprehension based on locus and modulus may be asked from this chapter.

Combinatorics includes permutations and combinations, Binomial Theorem and Probability. These chapters are first choice of a question setter and with transparent concept of the chapter one can solve the problem very confidently. In IIT-JEE 2009, two to three objective problems and one comprehension or matrix match may be asked on the notion of combinatorics.

Trigonometry is relatively less important (one or two questions may be asked) from the competition point of view but the concept of transformation formulae is the backbone of Calculus and Coordinate Geometry. Therefore, a student should thoroughly study Trigonometry which will help to solve miscellaneous problems. Additionally, stress should be given on the solution of trigonometric equations with boundary conditions.

In subsequent articles, more of such topics and their importance will be explained.