

## **REPORT OF THE COMMITTEE TO EXAMINE THE JEE SYSTEM**

### **Preamble**

In pursuance of the decision taken in the 49<sup>th</sup> IIT Council meeting held of 6<sup>th</sup> October, 2015 (Ref.: D.O. Order No.19-3/2011-TS.1 dated 8<sup>th</sup> October, 2015 from Government of India, Ministry of Human Resource Development, Department of Higher Education, Technical Section.1, New Delhi – Annexure I), it has been decided to constitute of a Committee of Eminent Persons to review the current JEE system for admission into IITs. The composition of the Committee of Eminent Persons is as under:

1.	Shri Ashok Misra, Chairperson, BoG, IIT Roorkee	Chairperson
2.	Shri Pawan Goenka, Chairperson, BoG, IIT Madras	Member
3.	Dr. Tessa Thomas, Outstanding Scientist & Director Advanced Systems Laboratory (ASL), Hyderabad	Member
4.	Prof. Gautam Barua, Mentor Director, IIIT-Guwahati	Member
5.	Prof. M.S. Ananth, Chairperson, IIITDM Kancheepuram	Member
6.	Dr. Baldev Raj, Chairman, BoG, IIT Gandhinagar	Member

2. The terms of reference of Committee of Eminent Persons review the current JEE system for admission into IITs is as under:

- To recommend structure of a single exam that tests the understanding, conceptual clarity, and innovative thinking of students for admission to IITs and NITs.
- To find means in the exam structure that would reduce the pressure on students and reduce dependence of students on the coaching centres, without diluting the quality of testing.
- To appreciably reduce the time taken from conduct of the entrance exam to declaration results, from the current 3 months.
- To review and recommend reforms if any needed in the common counseling process so that admissions in IITs, NITs, IISERs are completed without any difficulty.

3. The committee is to submit its report by 1<sup>st</sup> November. 2015.

Mr. Ajai Chowdhry, Chairperson, IIT Patna, was requested to join the above mentioned Committee as a Special Invitee.

## **Current status of Joint Entrance Examinations**

Presently there are two JEE examinations:

1. JEE (Main) conducted by CBSE in the first week of April and this came into effect since 2013. About 13+ lakh (1.3 million) students appear in this examination. It is a three hour objective type examination – with equal distribution of questions in Physics, Chemistry and Mathematics and a total 360 marks. About 20-25% take this exam online and the rest take it off line.

Further, out of these about 25,000 qualify for admission to National Institute of Technologies (NIT) and other Centrally Funded Technical Institutions (CFTI). For the NITs etc. For giving an All India Rank (AIR) 40% weightage is given to the Board marks. This has become a big challenge due to several reasons. The main one being that the marks distribution is very uneven in all the boards, which poses in several anomalies. Besides the Boards do not send the marks in time and that delays the process of giving AIRs.

2. From JEE (Main) marks only, the top 1.5 lakh (150k) are eligible to take the JEE (Advanced) for admission to the Indian Institutes of Technologies (IITs). JEE (Advanced) is conducted by the IITs in May and this consists of two 3 hour examination, with equal weightage given to Physics, Chemistry and Mathematics. This also has been in operation since 2013. Earlier the IITs had their own JEE in which 4+ lakh students appeared and dealing with these numbers was already becoming a problem. IITs admit about 10,000+ students and give ranks upto about 25000.
3. Earlier, the admission to the NITs, CFTIs etc. was done through an entrance examination conducted by CBSE, called AIEEE (All India Engineering Entrance Examination). This was done on the basis of marks alone.
4. In the new system of JEE, the counselling for IITs and NITs was done separately in 2013 and 2014. However, in 2015 the counselling was done jointly for the IITs and the NITs for the first time. This is also a bit of a challenge due to logistic issues, however it appeared to have helped in filling a larger number of seats at both these sets of institutions.

The IIT Council, through the above mentioned Office Order, has desired that there be only one entrance examination to reduce the stress level on the students and reduce the dependence on Coaching institutions. Of these about 10,000+ are to qualify for the IITs and 25,000+ to qualify for the NITs and CFTIs. The biggest challenge in this is to give AIRs to over 13 lakh candidates in a single test of 720 marks.

Another important issue is the proliferation of coaching centres. This has become a very large industry and had made students too much dependent on coaching centres. This has hurt the school education in a big way and also poses a major financial and logistics burden on the parents. A rough estimate puts the revenues of the coaching industry at Rs. 24,000 crores per

year (approx. \$ 4 billion). This presumes that 12 lakh students attend coaching for 2 years and pay Rs. 1.00 lakh per year. The actual number of years for coaching may be more than this and hence the revenues may be greater than the amount given above. It is desired that the dependence of students on the coaching centres be reduced.

### **Committee Deliberations**

The Committee held their meetings on:

1. October 6<sup>th</sup>, 2015 just after the IIT Council
2. October 19<sup>th</sup>, 2015 through a conference call
3. October 27<sup>th</sup>, 2015 through a conference call

The matters discussed were the following:

The details of the two JEE as they exist currently, both the JEE (Main) and JEE (advanced) as outlined above were discussed in detail. Further, the current status of coaching centres and quality of education in schools was discussed.

Based on this and the terms of reference for the committee, the issue was divided into parts:

- Deliberate on the merits of one or two examinations for admission to the IITs, NITs and other CFTIs in the short run and in the long run.
- Deliberate on the Coaching institutes, their effect on school education and suggestions for reducing the dependence on coaching in the selection of students for admission

### **Deliberation on One or two examinations**

The various points that emerged were:

1. The issue involves giving All India Ranks (AIR) to approximately 40,000 candidates to cover all the institutions out of 13+ lakhs students who appear for JEE. Currently 150,000 candidates are eligible to take the JEE (Advanced) and about 25,000 candidates are ranked. For this ranking the lowest aggregate qualifying marks are 35%, with minimum of 10% in each subject – Mathematics, Physics and Chemistry. For OBC candidates these numbers are 90% of this figure and for SC/ST and physically handicapped candidates these numbers become 50% of these figures i.e. 17.5% and 5%. Therefore, if more candidates have to be given ranks the numbers of marks in each subject will come close to zero or even negative. (Please note that there is negative marking). This is hardly a desirable situation. It was noted that of the 150,000 candidates eligible through JEE (Main) only about 125,000 actually choose to appear in JEE (Main). The rest choose to get admission in NITs etc. or State colleges.
2. The IITs are not in a position to conduct JEE type exam for 13+ lakh candidates with their current infrastructure and procedure of conducting the examination.

3. It was also noted that there was very little correlation to the merit list based on marks of the JEE (Main) and the AIRs given by JEE (Advanced).
4. The IITs will not accept the examination to be conducted by any other agency and there is merit in this as the IITs have maintained a standard for the examination over the past 55 years, which is well respected. The JEE (Advanced) conducted by the IITs currently, which is like the JEE in the past, is a tried and tested examination to select outstanding students for the IITs and this should not be tinkered with.
5. Further, Prof. Ashok Misra is also the Chairperson of the JEE (Main) Apex Board (JAB) and he informed the committee that JAB (Main) has recommended, vide report submitted earlier this year, that the practice of adding 40% marks from the respective boards may be discontinued due the difficulties in normalization. Instead JAB has recommended that the JEE (Main) should become a six hour exam of 720 marks – in two parts of 3 hours each of 360 marks. Currently, there is one paper of 360 marks. This will give a spread of ranks over larger maximum aggregate of 720 marks to rank 13 lakh candidates – this is a challenge in itself. The importance of Board examination will be preserved as the candidates will have to be in the top 75 percentile or have at least 65% marks (for smaller boards) to be eligible for admission. JAB (Main) also recommended that the exam be conducted twice a year, in December and April. It is noted that approx. 40% candidates are those who appear for the second time and they may prefer the December test. The minutes of JAB (Main) held on October 5<sup>th</sup> are attached (Annexure I).
6. A report was prepared by a special committee to analyse the working of the JEE (Main) over the past three years and this has some very interesting findings. The report was shared with the members and is given in Annexure II.
7. It is believed that currently students are going for coaching for the Board exams also. Removing the addition of marks for giving the AIRs will reduce the dependence of coaching to some extent.

### **Deliberations on reducing the effect of Coaching Institutions**

1. The current coaching is a very lucrative ‘industry’. As mentioned earlier, it has revenues of approximately Rs. 24,000 crores per year. However, it seems to fill a void – the absence of good teaching in schools – and does it effectively enough to make lots of money also. It is not always mindless profit, indeed at least some of the Coaching Institutions offer ‘scholarships’ for bright students who can’t afford them otherwise. There are still three objections.
  - The first is philosophical (yet important). The purpose of education is refinement of the mind not passing an entrance examination.
  - The second concerns the fact that ‘all work and no play’ makes a plus 12 grade student a dull individual with less involvement in activities other than studies.
  - The third is that students are forced to waste a lot time commuting in order to avail the benefit of ‘good’ coaching.

2. The first two can be best addressed by providing excellent facilities to school teachers including paying them well. Nationally we emphasize the importance of character building in education and the need to respect teacher socially. Of course, in order to be effective, this should be put in practice, especially for those who preach.
3. It is suggested that it would be helpful if there is a regulatory body for the coaching institutions. As an example, An All India Council for Coaching for Entrance Examinations (AICCEE) maybe established with the demand that Coaching Institutes are well equipped and maintain healthy and best practices as well as charge regulated fees.
4. It is recognized that the dependence on and the perceived need for Coaching can be reduced only over a period of time. However, we must work towards it.
5. It is also suggested that an online portal be set up for students to take mock tests while preparing for the JEE. The Corporates and the Government can use the services of good schools as well as good coaching institutes themselves to set up online coaching classes with interactivity.
6. The Committee deliberated on the possibility of an entirely new system of examination for the future, in lieu of JEE (Main), perhaps from 2017 onwards. For this, it is proposed that a National Testing Service (or a similar named agency) be set up in India along the lines of the Education Testing Service of USA. About three years ago MHRD also looked at such a possibility and a white paper on National Agency for Testing (NAT) was prepared with Mr. Vineet Joshi, the Chairman of CBSE at that time (Annexure III). Mr. Victor Menezes, an alumnus of IIT Bombay, is on the Board of ETS in USA and we may seek his advice in setting up NTS.
7. The proposal is that the Scholastic Aptitude Test (SAT) type examination be an aptitude test from which 4 or 5 lakh candidates would be chosen. This would have a quantitative and a qualitative portion. This test may be conducted several times in a year. Preferably this should be an online examination. It is believed that the SAT examination is a very good measure of the aptitude of students that get into leading universities and institutes in USA. SAT is very well tried and tested system and has shown excellent correlation with the ability of students to succeed in college. It is also believed that coaching does not have a significant role in the performance of students the in the SAT examination. Further, in due course after SAT stabilizes the scores may be used for admission in other sectors such as Medical Sciences, Sciences and Liberal Arts.
8. The second level test – JEE, to look like JEE (Advanced) – to be conducted by the IITs to give upto 40,000 AIR. Possibility of conducting these on-line to be looked into. With progress in technology we should get away from the system of carrying exam papers in steel trunks to examination centres.
9. The Committee recommended that MHRD should take steps to improve the School education in the country. It should be of such a level that the need for coaching becomes redundant. MHRD can start with the reforms in the CBSE as this is directly controlled by MHRD.
10. Currently, the desire of students to get into an IIT is too intense as there is a big gap in quality between them and the next level of institutions in the country. It is, therefore, imperative that the standard of the next level institutions – NITs, other CFTIs and State level

institutions, be increased as soon as possible. This will greatly reduce the dependence of coaching institutions in the country. In his context, there is a dire need to improve the standards of the state-level institutions, many of which were still respectable just four decades ago.

## **RECOMMENDATIONS**

In view of the several deliberations the Committee makes the two sets of recommendation as outlined below:

### **For examinations in the year 2016:**

1. The practice of two tier JEE examination for the year 2016 (and perhaps for 2017) to continue with some modifications. This will be beneficial for the students as they are currently geared up for it for this year. In any case the coaching in most places is completed by around the end of October for JEE in the coming year.
2. The JEE (Main) in its modified form, with two 3 hour papers (total 6 hours), to be conducted by CBSE and AIRs given. The total marks will be 720 and this will give a better scope of giving AIR to 40,000+ students.
3. The top 200,000 from JEE (Main) be eligible to appear in JEE (Advanced).
4. The IITs to see if the papers can be set so as to prepare the ranks with the lowest marks being a little higher than the current ones.
5. Points (c) and (d) will help in providing a platform for giving upto 40,000+ AIR, as a trial for developing a better system for selection of candidates.
6. Board marks not to be counted for giving AIR this year for NITs, CFTIs etc., as recommended by JAB (Main).
7. Joint counselling for IITs and NITs, as was done last year. With dependence on Board marks reduced, the counselling will be done in good time without stress on the system.

## **II. Develop a new system of Examination, preferably from 2017 onwards**

1. To set up National Testing Service (or a similar named agency) in India along the lines of the Education Testing Service of USA, preferably by early 2016.
2. NTS to conduct an Aptitude Test starting 2017 (or 2018), which should be developed such that it is independent of coaching. Short list about 4 lakh candidates, based on the cut off score in the NTS test, who will take the JEE. The Aptitude test may be offered 2 or more times in a year. It is proposed that this be an online test.
3. JEE will be along the lines of the current JEE (Advanced) and designed to test the knowledge in Physics, Chemistry and Mathematics. IITs to conduct the JEE for

admission to IITs, NITs, IISERs, CFTIs etc. and evolve a system to give AIRs upto 40,000+, or more as may be required.

4. The IITs be requested to set up a system for developing mock JEE examinations using the question bank from the 50+ years of JEE. This will help students prepare for the JEE significantly and wean them away from the coaching industry. The possibility of using the MOOCS platform to be explored.
5. Most importantly, MHRD to take measures for the improvement of school education in the country. The method of examination of the Boards should be critically examined and reviewed thus making the marks obtained by students more meaningful. Good emphasis to be given to teaching with an aptitude to Science subjects from early classes so the students with the Science aptitude are well prepared in the concepts involved by the time they reach 12<sup>th</sup> grade, thus removing the need for extra coaching.
6. Measures to be taken at an early date to improve the standard of the next level institutions, the NITs, CFTIs, and state level institutions. This will give the students a great canvas of institutions to choose from again reducing the need for coaching.



(Ashok Misra)  
Committee Chairperson

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