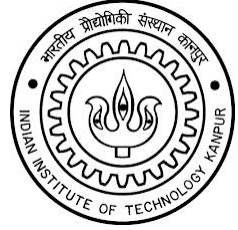


# JEE (Advanced) -2013 Information Brochure



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## 1. INTRODUCTION

Indian Institutes of Technology are institutions of national importance established through an Act of Parliament for fostering excellence in education. There are sixteen IITs at present, located at Bhubaneswar, Chennai, Delhi, Gandhinagar, Guwahati, Hyderabad, Indore, Jodhpur, Kanpur, Kharagpur, Mandi, Mumbai, Patna, Ropar, Roorkee and Varanasi. Over the years, IITs have created world class educational platform that is dynamically sustained through quality teaching and internationally acclaimed research with excellent infrastructure and the best available minds. The faculty and alumni of IITs continue to make huge impact in all sectors of society, both in India and abroad. Indian School of Mines Dhanbad is one of the oldest institutions in India and is known for its immense contributions towards society at large and for science and technology in particular.

Primary objectives of these institutions are to:

- Build a solid foundation of scientific and technical knowledge and thus to prepare competent and motivated engineers and scientists
- Create environment for freedom of thought, cultivate vision, encourage growth, develop personality and self-discipline for pursuit of excellence
- Kindle entrepreneurial streak in the students

The Institutes admit students with these objectives and prepare them to become outstanding professionals and contribute to nation building. Today, alumni of these institutions occupy key positions in industry and academia, in India and abroad.

Each institute has well-equipped modern laboratories, state-of-the-art computer network and well-stocked technical library. Teaching methods rely on direct personal contact between the teachers and the students, and the use of traditional and modern instructional techniques. Students live in a pleasant and intellectually stimulating environment with people having similar goals and aspirations, which is an exciting and unique experience.

These institutions offer courses leading to Bachelor's degree in a number of engineering, technological and science disciplines. Integrated M. Sc. courses in pure and applied sciences and Integrated M. Tech. courses in a few disciplines are also offered by some of these Institutions. In addition, some IITs offer Dual-Degree M. Tech. programmes, wherein both B. Tech. and M. Tech. degrees are awarded.

Credit-based academic programmes offer flexibility to students to progress at their own pace. A minimum level of performance is necessary for satisfactory progress. The medium of instruction is English.

Admission to all undergraduate programmes in these institutions for Indian and Foreign nationals will be made through a Joint Entrance Examination (Advanced) - 2013. Only the top 1,50,000 candidates (including all categories) who qualify in Paper - I of JEE (Main) - 2013 are eligible to appear in JEE (Advanced) - 2013. JEE (Main) - 2013 will be conducted by JEE Apex Board during the month of April, 2013. (Details of JEE (Main) - 2013 are available at <http://www.jeemain.nic.in>).

## 2. ABOUT JEE (Advanced) - 2013

JEE (Advanced) - 2013 will be jointly conducted by IIT Bombay, IIT Delhi, IIT Guwahati, IIT Kanpur, IIT Kharagpur, IIT Madras and IIT Roorkee. These institutes are henceforth referred to as the *zonal IITs*. The details of the pattern and the dates of examination, eligibility criteria and how to apply are outlined below.

### 2.1 Schedule

The JEE (Advanced) - 2013 examination will be held on **Sunday, 2 June, 2013** as per the schedule given below:

**Paper 1:** 09.00 to 12.00 hrs (IST)

**Paper 2:** 14.00 to 17.00 hrs (IST)

The schedule will remain unaltered even if the above day is declared a public holiday.

## 2.2 Type of Examination

In JEE (Advanced) - 2013, there will be two question papers, each of three hours duration. The question papers will be bilingual (in English and Hindi). Each of the question papers will consist of three separate sections on Physics, Chemistry and Mathematics. The detailed syllabi are given in **APPENDIX - 1**. The questions will be of objective type, designed to test comprehension, reasoning and analytical ability of candidates. In some sections, incorrect answers will be awarded negative marks.

The answers for each of the questions are to be marked on a separate, 2-sheet carbonless paper. **Candidate must not separate or disturb the alignment of the upper and lower sheets at any stage during the examination.** The upper sheet is specially designed machine readable sheet of paper (ORS-Optical Response Sheet). While answering each of the questions the candidate is expected to darken the bubble(s) against correct answer(s) only on the upper sheet using **black ball point pen**. The darkening on the upper sheet should be done in such a manner that the impression is seen on the lower sheet. Responses recorded on the upper sheet only will be taken as final. The candidate can take away the lower sheet with the permission of the invigilator(s) at the end of the examination.

## 2.3 Examination for Blind Candidates

A blind candidate can request for the services of amanuensis (Scribe). For this, the candidate must submit a separate request letter to the Chairman of respective Zonal IIT while registering for JEE (Advanced) - 2013 with a copy of the PD certificate obtained from the district medical board. The format of the letter is given in **APPENDIX - 2**. Amanuensis of class XI students of Commerce/Humanities without Mathematics will be provided by the Presiding Officer. One hour extra time will be allowed to such candidates.

## 2.4 Cities/Towns of Examination Centres

JEE (Advanced) - 2013 will be conducted in select major cities and towns of India. The list is given in **APPENDIX - 3**. While registering, candidates should select three **towns/cities in the same zone**. All correspondence should be addressed to that particular zonal IIT.

Efforts will be made to allot candidates' choice. However, in some exceptional circumstances, a different city in the same zone may be allotted. **The examination centre allotted to the candidates will not be changed under any circumstances.**

## 2.5 Use of Calculator and Communication Aids

Use of electronic devices like mobile phone, calculator, iPod, etc. is **NOT PERMITTED** in JEE (Advanced) - 2013. Materials like log table, book, notebook, etc. **SHOULD NOT** be brought into the examination hall.

## 3. ELIGIBILITY FOR JEE (Advanced) - 2013

Candidates who wish to write JEE (Advanced) - 2013 must write Paper - I of JEE (Main) - 2013 in the month of April 2013. For eligibility conditions to appear in JEE (Main) - 2013, please refer <http://www.jeemain.nic.in>. Only top 1,50,000 candidates (including all categories) who qualify in Paper - I of JEE (Main) - 2013 will be eligible to appear for JEE (Advanced) - 2013.

Distribution of top 1,50,000 candidates across various categories is as follows:

- Top 75750 (50.5 %) Common Merit List
- Top 40500 (27%) Other Backward Classes- Non creamy layer OBC (NCL)
- Top 22500 (15 %) Scheduled Caste (SC)
- Top 11250 (7.5 %) Scheduled Tribe (ST)

3% of the total candidates in each category are reserved for PD candidates as per Gol norms.

### 3.1 Minimum Marks in Qualifying Examination (QE)

Admission to IITs and ISM Dhanbad will be based only on category wise All India Rank (AIR) in JEE (Advanced) – 2013, subject to the condition that such candidates are in the top 20 percentile of **successful** candidates of their Boards in respective categories.

For candidates who passed their Board examination for the first time in 2012, the eligibility criteria for admission to any of the IITs or ISM Dhanbad is 60% marks (55% marks for SC/ST/PD) in their 12<sup>th</sup> Standard or equivalent qualifying examination.

In case a Board does not provide the information regarding the cut-off for top 20 percentile of successful candidates, the candidate will have to produce a certificate from the concerned Board stating that he/she falls within the top 20 percentile. In case the percentile score is not available from any testing agency, the CBSE cut-off score for top 20 percentile for the student's category will be used.

If the candidate fails to do so, then the **CBSE percentile** will be used as the criteria for deciding minimum percentage of marks in the qualifying examination.

If any Board awards only letter grades without providing an equivalent percentage of marks on the grade sheet, the candidate should obtain a certificate from the Board specifying the equivalent marks, and submit it at the time of counselling. In case such a certificate is not provided the decision taken by the Joint Implementation Committee (JIC) of JEE (Advanced) - 2013 will be final.

### 3.2 Number of JEE Attempts

A candidate can attempt JEE (Advanced) maximum two times in *consecutive* years. Candidates who had attempted IIT JEE 2012 for the first time (having passed QE in 2012) can appear in JEE (Advanced) - 2013, by qualifying in Paper - I of JEE (Main) - 2013. Those who attempted IIT-JEE in 2011 or earlier are **NOT ELIGIBLE** to appear in JEE (Advanced) - 2013.

### 3.3 Candidates Admitted Through Earlier IIT JEE

Candidates who have taken admission (irrespective of whether or not they continued in any of the programmes) or accepted the admission by paying the registration fee at any of the IITs, IT-BHU Varanasi or ISM Dhanbad, are **NOT ELIGIBLE** to appear in JEE (Advanced) - 2013.

### 3.4 Important Points

- (i) The offer of admission is subject to verification of all original certificates/documents at the time of counselling. If any candidate is found ineligible at a later date even after admission to an Institute, his/her admission will be cancelled.
- (ii) The decision of the Joint Admission Board of JEE (Advanced) - 2013 regarding the eligibility/admission of any applicant shall be final.

## 4. RESERVATION OF SEATS

As per Government of India rules candidates belonging to certain categories are admitted to seats reserved for them based on relaxed criteria. These categories are:

- Other Backward Classes (OBC) if they belong to Non-Creamy Layer (NCL)
- Scheduled Castes (SC)
- Scheduled Tribes (ST)
- Persons with Physical Disability (PD)

Benefit of reservation shall be given only to those classes/castes/tribes which are in the respective central list published by the Government of India.

### 4.1 SC/ST Candidates

For the SC and ST categories, 15% and 7.5% seats, respectively, are reserved in every programme in all IITs and ISM Dhanbad. Candidates belonging to these categories are

declared qualified on the basis of a relaxed criterion.

Candidates belonging to SC/ST categories will be required to produce the original caste/ tribe certificate issued by a competent authority in the prescribed format (**APPENDIX – 4**) during counselling. Certificates in any other format will not be accepted. Seats remaining vacant in these categories shall not be filled by candidates belonging to any other category.

Attested copies of category certificates must be submitted to the concerned Zonal IIT along with the registration number of JEE (Advanced) - 2013 during 8 May - 31 May, 2013.

#### 4.2 OBC Candidates

For candidates belonging to OBC (non creamy layer), 27% of the seats are reserved in all IITs, and ISM Dhanbad.

For the purpose of reservation of seats in JEE (Advanced) - 2013, a candidate will be considered as OBC only if he/she belongs to the **non-creamy layer of the central list of Government of India** in OBC category.

In case the reserved seats in this category are not filled, they can be filled by GE category candidates.

Attested copies of category certificates issued **after** 31 May 2012 by a competent authority in the prescribed format (**APPENDIX – 5**) must be submitted to the concerned Zonal IIT along with the registration number of JEE (Advanced) - 2013 during 8 May - 31 May, 2013.

#### 4.3 Persons with Physical Disability (PD)

In each institute 3% of seats in every category are reserved for PD candidates. For any category of disability (viz., locomotor, visual, dyslexia, speech, and/or hearing) benefit would be given to those who have at least 40% impairment. Leprosy-cured candidates who are otherwise fit to pursue the course are also included in this category. Candidates belonging to this category are qualified on the basis of a relaxed criterion.

PD Candidates will be required to produce the original certificate issued by a district medical board/competent authority in the prescribed format (**APPENDIX – 6**) at the time of counselling. Certificates in any other format will **not** be accepted.

Attested copies of PD certificates must be submitted to the concerned Zonal IIT along with the registration number of JEE (Advanced) - 2013 during 8 May - 31 May, 2013.

#### 4.4 Preparatory Course

In case the seats reserved for SC/ST/PD candidates are not filled, a limited number of candidates are admitted to a Preparatory Course of one-year duration on the basis of further relaxation of admission criterion. Admission is given to the candidates in the preparatory course provided (i) the seats reserved for the respective category are vacant (ii) candidates satisfy minimum norms, and (iii) candidates have not undergone the Preparatory Course earlier. On successful completion of the course, the students will be offered a direct admission to the undergraduate programs in July 2014, against the unfilled reserved seats of JEE (Advanced) - 2013.

#### 5. PREFERENTIAL ALLOTMENT OF SEATS FOR DS CANDIDATES

Two seats are available for preferential allotment in each institute for children of defence/paramilitary personnel killed or permanently disabled in action during war or peacetime operations (DS).

Such candidates should submit a copy of the relevant certificate issued by a competent authority in the Directorate of Resettlement and Rehabilitation, New Delhi under the Ministry of Defence, Govt. of India or in the Ministry of Home Affairs, Govt. of India, as applicable, along with the registration of JEE (Advanced) - 2013. To avail this preferential allotment, he/she must obtain a rank in the Common Merit List of JEE (Advanced) - 2013 and should produce original copy of certificate at the time of counselling.

## 6. HOW TO REGISTER FOR JEE (Advanced) - 2013

Scores of JEE (Main) - 2013 will be declared by 7 May, 2013. Top 1,50,000 candidates qualified in Paper - I (including all the categories) are eligible to register for JEE (Advanced) - 2013. To write JEE (Advanced) - 2013 all eligible candidates should register through online at [<http://jeeadv.iitd.ac.in/>] during 8 May to 13 May, 2013.

After online registration, candidates must pay the examination fee as applicable through challan (generated during registration process) of all SBI branches having core banking solution (CBS) on or before 13 May, 2013.

The examination fee for GE and OBC(NCL) male candidates is Rs.1800/-. The fee for SC, ST, PD male candidates is Rs. 900/-. There is no fee for female candidates of all categories. Registration is complete only after the payment.

**Important:** The applicants must note that application for JEE (Advanced) - 2013 cannot be withdrawn after registration and payment of fee. **Claims for refund of registration fee will not be entertained under any circumstances.**

While registering for JEE (Advanced) - 2013, candidate need to provide following information.

- **Attempt(s) at JEE**
- **Choices of Examination Cities/Towns Entitlement for DS category**

**Note:** APPENDIX - 3 lists the cities/towns and their corresponding codes where the examination centres are located. Candidates should select three different cities/towns from the **same zone**.

## 7. ADMIT CARD FOR JEE (ADVANCED) - 2013

After successful registration and payment of required fee through bank, the candidates can download their admit card for JEE (Advanced) -

2013 from 14 May to 31 May, 2013 from their Zonal IIT JEE (Advanced) - 2013 portal. Addresses of Zonal IITs JEE portals are available in **Appendix - 7**.

The admit card will bear registration number of JEE (Advanced) - 2013, photograph and the personal details of the candidate, along with name and address of the Examination Centre allotted.

If the admit card is not available in the Zonal IIT Portal by 15 May, 2013, candidates can contact immediately the Zonal IIT through Phone/Email/Fax (Details of Zonal IITs are available in **Appendix - 7**).

Candidate should carefully examine their Admit Card for all the entries made therein. In case of any discrepancy, candidate should inform the Zonal IIT immediately. Candidate must bring the hard copy of the downloaded admit card to the examination centre. **Only those candidates, who carry valid Admit Cards to the examination hall, will be allowed to write the examination.**

### 7.1 Identity Verification

At the examination hall, the admit card should be presented to the invigilators for verification. The candidate's identity will be verified with respect to his/her details on the admit card and the centre verification record. If the identity is in doubt, the candidate will not be allowed to appear in the examination. The authorities may at their discretion permit the candidate to appear for the examination after completing formalities including taking of thumb impression. No extra time will be allowed for these formalities to be completed.

The original admit card for the JEE (Advanced) - 2013 will be issued to the candidates in the respective examination centre on the day of examination after verifying their candidature. Any impersonation will lead to disqualification in JEE (Advanced) - 2013.

### 7.2 Safe-keep of the Admit Card

Since the qualified candidates are required to produce the original Admit Card at the time of



counselling and admission, it should be carefully preserved till the admission process through JEE (Advanced) - 2013 is completed.

## 8. RESULTS OF JEE (Advanced) - 2013

The answer sheets of JEE (Advanced) - 2013 are a machine-readable Optical Response Sheet (ORS). These sheets are graded and scrutinized with extreme care after the examination.

Candidates can view the answer keys of JEE (Advanced) - 2013 on Zonal IIT JEE (Advanced) portal.

Candidates will get to know their All India Ranks (AIR) / Category ranks of JEE (Advanced) – 2013 through Zonal IIT websites on **23 June, 2013**.

## 9 PROCEDURES FOR DETERMINING THE CUT-OFF MARKS AND RANKING

Only those candidates who attempted both **Paper - 1** and **Paper - 2** of JEE (Advanced) - 2013 will be considered for the ranking. Marks in Physics in JEE (Advanced) - 2013 will be equal to marks in Physics section of **Paper - 1** plus marks in Physics section of **Paper - 2**. Similar procedures will be followed for Chemistry and Mathematics. The sum of the marks obtained in the individual subjects will be the aggregate marks for the candidate.

### 9.1 Rank Lists

Based on the performance in JEE (Advanced) - 2013, a Common Merit List (CML) will be prepared. Candidates must score at least 10% in each subject and 35% in aggregate in order to be in the CML.

Separate merit lists will be prepared corresponding to OBC (NCL), SC and ST categories.

Candidates of OBC (NCL) category must score at least 9% in each subject and 31.5% in aggregate in order to be in the OBC merit list.

Candidates of SC and ST categories must score at least 5% in each subject and 17.5% in

aggregate in order to be in their respective merit lists.

### 9.2 PD Merit Lists

Separate PD merit lists will be prepared corresponding to the GE, OBC (NCL), SC and ST categories. To be in these respective merit lists, candidates must score at least 5% in each subject and 17.5% in aggregate.

### 9.3 Preparatory Course Merit Lists

Separate merit lists will be prepared for preparatory course only if the number of SC/ST/PD candidates in the respective merit lists is less than 1.4 times the number of seats available in the respective categories. To be in these merit lists, candidates must score at least 2.5% in each subject and 8.75% in aggregate. While preparing the merit lists, if a candidate belongs to more than one category of relaxed norms, then he/she for the purpose of ranking shall be considered in all the categories in which he/she qualifies. There will be no separate waiting list for such candidates.

### 9.4 Tie-break

The tie-break criterion in the various merit lists adopted for awarding ranks to the candidates who have scored the same aggregate marks is as follows: Higher rank for higher marks in Mathematics, followed by marks in Physics and same rank in case both the candidates have the same marks in each of the three subjects.

**Note: Obtaining a rank in JEE (Advanced) - 2013 does not guarantee admission to any of the courses available in IITs and ISM Dhanbad.**

## 10. COUNSELLING AND ADMISSIONS

### 10.1 Counselling

The details of courses available in the participating institutes are given in **APPENDIX - 9** (Provisional). Some institutes may offer new courses not listed in the appendix. Information regarding these courses will be available at the time of counselling.

The seats in various courses of the institutes (IITs and ISM Dhanbad) are allotted strictly on the basis of the All India Rank, category rank, and the choices indicated by each qualified candidate at the time of counselling.

The details of the counselling and admission procedure will be published on the JEE (Advanced) - 2013 zonal IIT websites.

The results of JEE (Advanced) - 2013 are also being used by other institutions for admissions to their courses / programmes. The names of these institutes will be published on the JEE (Advanced) - 2013 websites at a later date. Candidates should contact these institutes directly for admission.

## 10.2 Physical Fitness

Candidates who qualify in JEE (Advanced) - 2013 will have to submit a physical fitness certificate from a registered medical practitioner in the prescribed format that will be made available at an appropriate time. Candidates will be admitted only if they are physically fit for pursuing a course of study at the participating institutes.

## 10.3 Requirements for Mining Courses

Those who opt for Mining Engineering and Mining Machinery courses should make sure that they do not have any form of colour blindness. They will be required to submit a certificate from a registered medical practitioner to this effect at the time of counselling/ admission. The standards of visual acuity with or without glasses will be adhered to strictly for candidates seeking admission to Mining Engineering as per DGMS Circular 14 of 1972. Persons with one-eyed vision are not permitted to work underground. Candidates with the above limitations are not allowed to opt for admission to Mining Engineering or Mining Machinery Engineering.

## 10.4 Female Candidates for Mining Courses

Section 46 (1) of the Mines Act, 1952 states that *“No woman shall, notwithstanding anything*

*contained in any other law, be employed (a) in any part of a mine which is below ground, (b) in any mine above ground except between 6:00 and 19:00 hrs.”*. Hence, female candidates are not admitted to Mining Engineering and Mining Machinery Engineering at ISM Dhanbad, whereas the corresponding programmes at IIT Kharagpur and IIT (BHU) Varanasi have no such restriction.

## 10.5 Aptitude Test for B. Arch. for the IIT-JEE (Advanced) - 2013 Qualified Candidates

Candidates desirous of joining the B. Arch., courses will be required to qualify in an Aptitude Test to be conducted at all zonal IITs on **28 June, 2013**. However the seat allotment will be done based on the category wise all India Rank in the JEE (Advanced) -2013. The test will consist of one paper of three hours duration – from 09:00 to 12:00 hrs. Question papers for Aptitude Test for B. Arch. will be in English only. Syllabus for this test is given in **APPENDIX - 8**. Candidates must register online at <http://jeeadv.iitd.ac.in> for this Aptitude Test between **24 and 26 June, 2013**.

## SYLLABUS FOR JEE (Advanced) - 2013

Chemistry

## Physical Chemistry

**General topics:** Concept of atoms and molecules; Dalton's atomic theory; Mole concept; Chemical formulae; Balanced chemical equations; Calculations (based on mole concept) involving common oxidation-reduction, neutralisation, and displacement reactions; Concentration in terms of mole fraction, molarity, molality and normality.

**Gaseous and liquid states:** Absolute scale of temperature, ideal gas equation; Deviation from ideality, van der Waals equation; Kinetic theory of gases; Average, root mean square and most probable velocities and their relation with temperature; Law of partial pressures; Vapour pressure; Diffusion of gases.

**Atomic structure and chemical bonding:** Bohr model, spectrum of hydrogen atom, quantum numbers; Wave-particle duality, de Broglie hypothesis; Uncertainty principle; Qualitative quantum mechanical picture of hydrogen atom, shapes of s, p and d orbitals; Electronic configurations of elements (up to atomic number 36); Aufbau principle; Pauli's exclusion principle and Hund's rule; Orbital overlap and covalent bond; Hybridisation (involving s, p and d orbitals only); Orbital energy diagrams for homonuclear diatomic species; Hydrogen bond; Polarity in molecules, dipole moment (qualitative aspects only); VSEPR model and shapes of molecules (linear, angular, triangular, square planar, pyramidal, square pyramidal, trigonal bipyramidal, tetrahedral and octahedral).

**Energetics:** First law of thermodynamics; Internal energy, work and heat, pressure-volume work; Enthalpy, Hess's law; Heat of reaction, fusion and vapourization; Second law of thermodynamics; Entropy; Free energy; Criterion of spontaneity.

**Chemical equilibrium:** Law of mass action; Equilibrium constant, Le Chatelier's principle (effect of concentration, temperature and pressure); Significance of  $\Delta G$  and  $\Delta G^\circ$  in chemical equilibrium; Solubility product, common ion effect, pH and buffer solutions;

Acids and bases (Bronsted and Lewis concepts); Hydrolysis of salts.

**Electrochemistry:** Electrochemical cells and cell reactions; Standard electrode potentials; Nernst equation and its relation to  $\Delta G$ ; Electrochemical series, emf of galvanic cells; Faraday's laws of electrolysis; Electrolytic conductance, specific, equivalent and molar conductivity, Kohlrausch's law; Concentration cells.

**Chemical kinetics:** Rates of chemical reactions; Order of reactions; Rate constant; First order reactions; Temperature dependence of rate constant (Arrhenius equation).

**Solid state:** Classification of solids, crystalline state, seven crystal systems (cell parameters  $a, b, c, \alpha, \beta, \gamma$ ), close packed structure of solids (cubic), packing in fcc, bcc and hcp lattices; Nearest neighbours, ionic radii, simple ionic compounds, point defects.

**Solutions:** Raoult's law; Molecular weight determination from lowering of vapour pressure, elevation of boiling point and depression of freezing point.

**Surface chemistry:** Elementary concepts of adsorption (excluding adsorption isotherms); Colloids: types, methods of preparation and general properties; Elementary ideas of emulsions, surfactants and micelles (only definitions and examples).

**Nuclear chemistry:** Radioactivity: isotopes and isobars; Properties of  $\alpha, \beta$  and  $\gamma$  rays; Kinetics of radioactive decay (decay series excluded), carbon dating; Stability of nuclei with respect to proton-neutron ratio; Brief discussion on fission and fusion reactions.

## Inorganic Chemistry

**Isolation/preparation and properties of the following non-metals:** Boron, silicon, nitrogen, phosphorus, oxygen, sulphur and halogens; Properties of allotropes of carbon (only diamond and graphite), phosphorus and sulphur.

**Preparation and properties of the following compounds:** Oxides, peroxides, hydroxides, carbonates, bicarbonates, chlorides and sulphates of sodium, potassium, magnesium and calcium; Boron: diborane, boric acid and borax; Aluminium: alumina, aluminium chloride

and alums; Carbon: oxides and oxyacid (carbonic acid); Silicon: silicones, silicates and silicon carbide; Nitrogen: oxides, oxyacids and ammonia; Phosphorus: oxides, oxyacids (phosphorus acid, phosphoric acid) and phosphine; Oxygen: ozone and hydrogen peroxide; Sulphur: hydrogen sulphide, oxides, sulphurous acid, sulphuric acid and sodium thiosulphate; Halogens: hydrohalic acids, oxides and oxyacids of chlorine, bleaching powder; Xenon fluorides.

**Transition elements (3d series):** Definition, general characteristics, oxidation states and their stabilities, colour (excluding the details of electronic transitions) and calculation of spin-only magnetic moment; Coordination compounds: nomenclature of mononuclear coordination compounds, *cis-trans* and ionisation isomerisms, hybridization and geometries of mononuclear coordination compounds (linear, tetrahedral, square planar and octahedral).

**Preparation and properties of the following compounds:** Oxides and chlorides of tin and lead; Oxides, chlorides and sulphates of  $\text{Fe}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Zn}^{2+}$ ; Potassium permanganate, potassium dichromate, silver oxide, silver nitrate, silver thiosulphate.

**Ores and minerals:** Commonly occurring ores and minerals of iron, copper, tin, lead, magnesium, aluminium, zinc and silver.

**Extractive metallurgy:** Chemical principles and reactions only (industrial details excluded); Carbon reduction method (iron and tin); Self reduction method (copper and lead); Electrolytic reduction method (magnesium and aluminium); Cyanide process (silver and gold).

**Principles of qualitative analysis:** Groups I to V (only  $\text{Ag}^+$ ,  $\text{Hg}_2^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Bi}^{3+}$ ,  $\text{Fe}^{3+}$ ,  $\text{Cr}^{3+}$ ,  $\text{Al}^{3+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Ba}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Mn}^{2+}$  and  $\text{Mg}^{2+}$ ); Nitrate, halides (excluding fluoride), sulphate and sulphide.

## Organic Chemistry

**Concepts:** Hybridisation of carbon; Sigma and pi-bonds; Shapes of simple organic molecules; Structural and geometrical isomerism; Optical isomerism of compounds containing up to two asymmetric centres, (*R,S* and *E,Z* nomenclature excluded); IUPAC nomenclature

of simple organic compounds (only hydrocarbons, mono-functional and bi-functional compounds); Conformations of ethane and butane (Newman projections); Resonance and hyperconjugation; Keto-enol tautomerism; Determination of empirical and molecular formulae of simple compounds (only combustion method); Hydrogen bonds: definition and their effects on physical properties of alcohols and carboxylic acids; Inductive and resonance effects on acidity and basicity of organic acids and bases; Polarity and inductive effects in alkyl halides; Reactive intermediates produced during homolytic and heterolytic bond cleavage; Formation, structure and stability of carbocations, carbanions and free radicals.

**Preparation, properties and reactions of alkanes:** Homologous series, physical properties of alkanes (melting points, boiling points and density); Combustion and halogenation of alkanes; Preparation of alkanes by Wurtz reaction and decarboxylation reactions.

**Preparation, properties and reactions of alkenes and alkynes:** Physical properties of alkenes and alkynes (boiling points, density and dipole moments); Acidity of alkynes; Acid catalysed hydration of alkenes and alkynes (excluding the stereochemistry of addition and elimination); Reactions of alkenes with  $\text{KMnO}_4$  and ozone; Reduction of alkenes and alkynes; Preparation of alkenes and alkynes by elimination reactions; Electrophilic addition reactions of alkenes with  $\text{X}_2$ ,  $\text{HX}$ ,  $\text{HOX}$  and  $\text{H}_2\text{O}$  ( $\text{X}=\text{halogen}$ ); Addition reactions of alkynes; Metal acetylides.

**Reactions of benzene:** Structure and aromaticity; Electrophilic substitution reactions: halogenation, nitration, sulphonation, Friedel-Crafts alkylation and acylation; Effect of *o*-, *m*- and *p*-directing groups in monosubstituted benzenes.

**Phenols:** Acidity, electrophilic substitution reactions (halogenation, nitration and sulphonation); Reimer-Tiemann reaction, Kolbe reaction.

**Characteristic reactions of the following (including those mentioned above):** Alkyl halides: rearrangement reactions of alkyl

carbocation, Grignard reactions, nucleophilic substitution reactions; Alcohols: esterification, dehydration and oxidation, reaction with sodium, phosphorus halides,  $ZnCl_2$ /concentrated HCl, conversion of alcohols into aldehydes and ketones; Ethers: Preparation by Williamson's Synthesis; Aldehydes and Ketones: oxidation, reduction, oxime and hydrazone formation; Aldol condensation, Perkin reaction; Cannizzaro reaction; Haloform reaction and nucleophilic addition reactions (Grignard addition); Carboxylic acids: formation of esters, acid chlorides and amides, ester hydrolysis; Amines: basicity of substituted anilines and aliphatic amines, preparation from nitro compounds, reaction with nitrous acid, azo coupling reaction of diazonium salts of aromatic amines, Sandmeyer and related reactions of diazonium salts; carbylamine reaction; Haloarenes: nucleophilic aromatic substitution in haloarenes and substituted haloarenes (excluding Benzyne mechanism and Cine substitution).

**Carbohydrates:** Classification; mono- and disaccharides (glucose and sucrose); Oxidation, reduction, glycoside formation and hydrolysis of sucrose.

**Amino acids and peptides:** General structure (only primary structure for peptides) and physical properties.

**Properties and uses of some important polymers:** Natural rubber, cellulose, nylon, teflon and PVC.

**Practical organic chemistry:** Detection of elements (N, S, halogens); Detection and identification of the following functional groups: hydroxyl (alcoholic and phenolic), carbonyl (aldehyde and ketone), carboxyl, amino and nitro; Chemical methods of separation of mono-functional organic compounds from binary mixtures.

## Mathematics

**Algebra:** Algebra of complex numbers, addition, multiplication, conjugation, polar representation, properties of modulus and principal argument, triangle inequality, cube roots of unity, geometric interpretations.

Quadratic equations with real coefficients, relations between roots and coefficients, formation of quadratic equations with given roots, symmetric functions of roots.

Arithmetic, geometric and harmonic progressions, arithmetic, geometric and harmonic means, sums of finite arithmetic and geometric progressions, infinite geometric series, sums of squares and cubes of the first  $n$  natural numbers.

Logarithms and their properties.

Permutations and combinations, Binomial theorem for a positive integral index, properties of binomial coefficients.

Matrices as a rectangular array of real numbers, equality of matrices, addition, multiplication by a scalar and product of matrices, transpose of a matrix, determinant of a square matrix of order up to three, inverse of a square matrix of order up to three, properties of these matrix operations, diagonal, symmetric and skew-symmetric matrices and their properties, solutions of simultaneous linear equations in two or three variables.

Addition and multiplication rules of probability, conditional probability, Bayes Theorem, independence of events, computation of probability of events using permutations and combinations.

**Trigonometry:** Trigonometric functions, their periodicity and graphs, addition and subtraction formulae, formulae involving multiple and sub-multiple angles, general solution of trigonometric equations.

Relations between sides and angles of a triangle, sine rule, cosine rule, half-angle formula and the area of a triangle, inverse trigonometric functions (principal value only).

### **Analytical geometry (2 dimensions):**

Cartesian coordinates, distance between two points, section formulae, shift of origin.

Equation of a straight line in various forms, angle between two lines, distance of a point from a line; Lines through the point of intersection of two given lines, equation of the bisector of the angle between two lines, concurrency of lines; Centroid, orthocentre, incentre and circumcentre of a triangle.

Equation of a circle in various forms, equations of tangent, normal and chord.

Parametric equations of a circle, intersection of a circle with a straight line or a circle, equation of a circle through the points of intersection of two circles and those of a circle and a straight line.

Equations of a parabola, ellipse and hyperbola in standard form, their foci, directrices and eccentricity, parametric equations, equations of tangent and normal.

Locus Problems.

### **Analytical geometry (3 dimensions):**

Direction cosines and direction ratios, equation of a straight line in space, equation of a plane, distance of a point from a plane.

**Differential calculus:** Real valued functions of a real variable, into, onto and one-to-one functions, sum, difference, product and quotient of two functions, composite functions, absolute value, polynomial, rational, trigonometric, exponential and logarithmic functions.

Limit and continuity of a function, limit and continuity of the sum, difference, product and quotient of two functions, L'Hospital rule of evaluation of limits of functions.

Even and odd functions, inverse of a function, continuity of composite functions, intermediate value property of continuous functions.

Derivative of a function, derivative of the sum, difference, product and quotient of two functions, chain rule, derivatives of polynomial, rational, trigonometric, inverse trigonometric, exponential and logarithmic functions.

Derivatives of implicit functions, derivatives up to order two, geometrical interpretation of the derivative, tangents and normals, increasing and decreasing functions, maximum and minimum values of a function, Rolle's Theorem and Lagrange's Mean Value Theorem.

**Integral calculus:** Integration as the inverse process of differentiation, indefinite integrals of standard functions, definite integrals and their properties, Fundamental Theorem of Integral Calculus.

Integration by parts, integration by the methods of substitution and partial fractions, application

of definite integrals to the determination of areas involving simple curves.

Formation of ordinary differential equations, solution of homogeneous differential equations, separation of variables method, linear first order differential equations.

**Vectors:** Addition of vectors, scalar multiplication, dot and cross products, scalar triple products and their geometrical interpretations.

### **Physics**

**General:** Units and dimensions, dimensional analysis; least count, significant figures; Methods of measurement and error analysis for physical quantities pertaining to the following experiments: Experiments based on using Vernier calipers and screw gauge (micrometer), Determination of  $g$  using simple pendulum, Young's modulus by Searle's method, Specific heat of a liquid using calorimeter, focal length of a concave mirror and a convex lens using  $u-v$  method, Speed of sound using resonance column, Verification of Ohm's law using voltmeter and ammeter, and specific resistance of the material of a wire using meter bridge and post office box.

**Mechanics:** Kinematics in one and two dimensions (Cartesian coordinates only), projectiles; Uniform Circular motion; Relative velocity.

Newton's laws of motion; Inertial and uniformly accelerated frames of reference; Static and dynamic friction; Kinetic and potential energy; Work and power; Conservation of linear momentum and mechanical energy.

Systems of particles; Centre of mass and its motion; Impulse; Elastic and inelastic collisions.

Law of gravitation; Gravitational potential and field; Acceleration due to gravity; Motion of planets and satellites in circular orbits; Escape velocity.

Rigid body, moment of inertia, parallel and perpendicular axes theorems, moment of inertia of uniform bodies with simple geometrical shapes; Angular momentum; Torque; Conservation of angular momentum; Dynamics of rigid bodies with fixed axis of rotation; Rolling without slipping of rings,

cylinders and spheres; Equilibrium of rigid bodies; Collision of point masses with rigid bodies.

Linear and angular simple harmonic motions.

Hooke's law, Young's modulus.

Pressure in a fluid; Pascal's law; Buoyancy; Surface energy and surface tension, capillary rise; Viscosity (Poiseuille's equation excluded), Stoke's law; Terminal velocity, Streamline flow, equation of continuity, Bernoulli's theorem and its applications.

Wave motion (plane waves only), longitudinal and transverse waves, superposition of waves; Progressive and stationary waves; Vibration of strings and air columns; Resonance; Beats; Speed of sound in gases; Doppler effect (in sound).

**Thermal physics:** Thermal expansion of solids, liquids and gases; Calorimetry, latent heat; Heat conduction in one dimension; Elementary concepts of convection and radiation; Newton's law of cooling; Ideal gas laws; Specific heats ( $C_V$  and  $C_P$  for monoatomic and diatomic gases); Isothermal and adiabatic processes, bulk modulus of gases; Equivalence of heat and work; First law of thermodynamics and its applications (only for ideal gases); Blackbody radiation: absorptive and emissive powers; Kirchhoff's law; Wien's displacement law, Stefan's law.

**Electricity and magnetism:** Coulomb's law; Electric field and potential; Electrical potential energy of a system of point charges and of electrical dipoles in a uniform electrostatic field; Electric field lines; Flux of electric field; Gauss's law and its application in simple cases, such as, to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell.

Capacitance; Parallel plate capacitor with and without dielectrics; Capacitors in series and parallel; Energy stored in a capacitor.

Electric current; Ohm's law; Series and parallel arrangements of resistances and cells; Kirchhoff's laws and simple applications; Heating effect of current.

Biot-Savart's law and Ampere's law; Magnetic field near a current-carrying straight wire, along the axis of a circular coil and inside a long

straight solenoid; Force on a moving charge and on a current-carrying wire in a uniform magnetic field.

Magnetic moment of a current loop; Effect of a uniform magnetic field on a current loop; Moving coil galvanometer, voltmeter, ammeter and their conversions.

Electromagnetic induction: Faraday's law, Lenz's law; Self and mutual inductance; RC, LR and LC circuits with d.c. and a.c. sources.

**Optics:** Rectilinear propagation of light; Reflection and refraction at plane and spherical surfaces; Total internal reflection; Deviation and dispersion of light by a prism; Thin lenses; Combinations of mirrors and thin lenses; Magnification.

Wave nature of light: Huygen's principle, interference limited to Young's double-slit experiment.

**Modern physics:** Atomic nucleus; Alpha, beta and gamma radiations; Law of radioactive decay; Decay constant; Half-life and mean life; Binding energy and its calculation; Fission and fusion processes; Energy calculation in these processes.

Photoelectric effect; Bohr's theory of hydrogen-like atoms; Characteristic and continuous X-rays, Moseley's law; de Broglie wavelength of matter waves

**FORMAT OF REQUEST LETTER FOR SCRIBE AND EXTRA TIME FOR BLIND CANDIDATES**

Date:

Name of the candidate :

Application Number of JEE (Main)-2013:

Registration Number of JEE (Advanced) -2013:

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Mobile:

Email:

To

The Chairman

JEE (Advanced) - 2013

Indian Institute of Technology \_\_\_\_\_(Write Appropriate Zone)

Sub: Requirement of SCRIBE and EXTRA TIME

Dear Sir,

I am a blind candidate and I would like to use the services of a scribe for writing JEE (Advanced) - 2013. I also request you to provide one hour extra time in each paper.

I undertake to abide by the rules and regulations in this connection prescribed in the information brochure of JEE (Advanced) - 2013.

Thanking you,

\_\_\_\_\_

**Signature/Left Thumb Impression of the candidate**

(Name of the candidate)

**Signature of the Parent/Guardian**

(Name of the Parent/Guardian)

**Enclosure: Attested copy of PD Certificate (APPENDIX - 6) issued by competent authority.**



## APPENDIX - 3

### LIST OF EXAMINATION CITIES / TOWNS FOR JEE (Advanced)-2013

<b>IIT BOMBAY ZONE</b>		<b>ASSAM</b>		<b>ORISSA</b>		Bathinda	708
<b>State/City/Town</b>	<b>Code</b>	Guwahati	302	Bhubaneswar	510	Jalandhar	709
		Jorhat	303	Rourkela	511	Ludhiana	710
		Silchar	304			Patiala	711
<b>GOA</b>		<b>BIHAR</b>		<b>SIKKIM</b>		<b>UTTARAKHAND</b>	
Panaji	101	Gaya	305	Gangtok	512	Dehradun	712
<b>GUJARAT</b>		Katihar	306	<b>TRIPURA</b>		Roorkee	713
Ahmedabad	102	Muzaffarpur	307	Agartala	513		
Surat	103	Patna	308	<b>WEST BENGAL</b>		<b>UTTAR PRADESH</b>	
Vadodara	104	<b>MANIPUR</b>		Durgapur	514	Bareilly	714
<b>MAHARASHTRA</b>		Imphal	309	Kharagpur	515	Gautam Budh Nagar	715
Mumbai	105	<b>MEGHALAYA</b>		Kolkata (North)	516	(Noida)	
Nagpur	106	Shillong	310	Kolkata (Salt Lake)	517	Ghaziabad	716
Navi Mumbai	107	<b>WEST BENGAL</b>		Kolkata (South)	518	Meerut	717
Pune	108	Siliguri	311	Malda	519	Moradabad	718
<b>RAJASTHAN</b>						Varanasi	719
Ajmer	109	<b>IIT KANPUR ZONE</b>		<b>IIT MADRAS ZONE</b>			
Jaipur	110	<b>State/City/Town</b>	<b>Code</b>	<b>State/City/Town</b>	<b>Code</b>		
Jodhpur	111	<b>MADHYA PRADESH</b>		<b>ANDHRA PRADESH</b>			
		Bhopal	401	Hyderabad	601		
		Gwalior	402	Nellore	602		
		Jabalpur	403	Vijayawada	603		
		<b>UTTARAKHAND</b>		Warangal	604		
		Pantnagar	404	<b>KARNATAKA</b>			
		<b>UTTAR PRADESH</b>		Bangalore	605		
		Agra	405	Mangalore	606		
		Allahabad	406	<b>KERALA</b>			
		Gorakhpur	407	Kochi	607		
		Jhansi	408	Kozhikode	608		
		Kanpur	409	Thiruvananthapuram	609		
		Lucknow	410	<b>PUDUCHERRY</b>			
				Puducherry	610		
		<b>IIT KHARAGPUR ZONE</b>		<b>TAMIL NADU</b>			
		<b>State/City/Town</b>	<b>Code</b>	Chennai	611		
		<b>ANDAMAN AND NICOBAR ISLANDS</b>		Madurai	612		
		Port Blair	501	<b>IIT ROORKEE ZONE</b>			
		<b>ANDHRA PRADESH</b>		<b>State/City/Town</b>	<b>Code</b>		
		Visakhapatnam	502	<b>CHANDIGARH</b>			
		<b>CHATTISGARH</b>		Chandigarh	701		
		Bilaspur	503	<b>HARYANA</b>			
		Bilaspur	504	Kurukshetra	702		
		Raipur	505	Panipat	703		
		<b>JHARKHAND</b>		Rohtak	704		
		Bokaro	506	<b>HIMACHAL PRADESH</b>			
		Dhanbad	507	Palampur	705		
		Jamshedpur	508	Shimla	706		
		Ranchi	509	<b>PUNJAB</b>			
		<b>IIT GUWAHATI ZONE</b>		Amritsar	707		
<b>State/City/Town</b>	<b>Code</b>						
<b>ARUNACHAL PRADESH</b>							
Itanagar	301						

## APPENDIX - 4

### FORM OF CERTIFICATE TO BE PRODUCED BY SCHEDULED CASTES AND SCHEDULED TRIBES CANDIDATES

1. This is to certify that Shri/ Shrimati/ Kumari\* \_\_\_\_\_  
son/daughter\* of \_\_\_\_\_ of Village/Town\* \_\_\_\_\_  
District/Division\* \_\_\_\_\_ of State/Union Territory\* \_\_\_\_\_ belongs to  
the \_\_\_\_\_ Scheduled Caste / Scheduled Tribe\* under :-

- \* The Constitution (Scheduled Castes) Order, 1950
- \* The Constitution (Scheduled Tribes) Order, 1950
- \* **The Constitution (Scheduled Castes) (Union Territories) Order, 1951**
- \* The Constitution (Scheduled Tribes) (Union Territories) Order, 1951

[As amended by the Scheduled Castes and Scheduled Tribes Lists (Modification Order) 1956, the Bombay Reorganisation Act, 1960, the Punjab Reorganisation Act, 1966, the State of Himachal Pradesh Act, 1970, the North Eastern Areas (Reorganisation) Act, 1971, the Scheduled Castes and Scheduled Tribes Orders (Amendment) Act, 1976 and the Scheduled Castes and Scheduled Tribes Orders (Amendment) Act, 2002]

- \* The Constitution (Jammu and Kashmir) Scheduled Castes Order, 1956;
- \* The Constitution (Andaman and Nicobar Islands) Scheduled Tribes Order, 1959, as amended by the Scheduled Castes and Scheduled Tribes Order (Amendment) Act, 1976;
- \* **The Constitution (Dadara and Nagar Haveli) Scheduled Castes Order, 1962;**
- \* The Constitution (Dadara and Nagar Haveli) Scheduled Tribes Order, 1962;
- \* The Constitution (Pondicherry) Scheduled Castes Order, 1964;
- \* The Constitution (Uttar Pradesh) Scheduled Tribes Order, 1967;
- \* The Constitution (Goa, Daman and Diu) Scheduled Castes Order, 1968;
- \* The Constitution (Goa, Daman and Diu) Scheduled Tribes Order, 1968;
- \* The Constitution (Nagaland) Scheduled Tribes Order, 1970;
- \* The Constitution (Sikkim) Scheduled Castes Order, 1978;
- \* The Constitution (Sikkim) Scheduled Tribes Order, 1978;
- \* The Constitution (Jammu and Kashmir) Scheduled Tribes Order, 1989;
- \* The Constitution (Scheduled Castes) Order (Amendment) Act, 1990;
- \* The Constitution (Scheduled Tribes) Order (Amendment) Act, 1991;
- \* The Constitution (Scheduled Tribes) Order (Second Amendment) Act, 1991;

2. # This certificate is issued on the basis of the Scheduled Castes / Scheduled Tribes\* Certificate issued to Shri /Shrimati\* \_\_\_\_\_ father/mother\* of Shri /Shrimati /Kumari\* \_\_\_\_\_ of Village/Town\* \_\_\_\_\_ in District/Division\* \_\_\_\_\_ of the State State/Union Territory\* \_\_\_\_\_ who belong to the Caste / Tribe\* which is recognised as a Scheduled Caste / Scheduled Tribe\* in the State / Union Territory\* \_\_\_\_\_ issued by the \_\_\_\_\_ dated \_\_\_\_\_.

3. Shri/ Shrimati/ Kumari \* \_\_\_\_\_ and / or\* his / her\* family ordinarily reside(s)\*\* in Village/Town\* \_\_\_\_\_ of \_\_\_\_\_ District/Division\* of the State Union Territory\* \_\_\_\_\_.

Signature: \_\_\_\_\_  
Designation \_\_\_\_\_  
(with seal of the Office)

Place: \_\_\_\_\_ State/Union Territory\* \_\_\_\_\_  
Date: \_\_\_\_\_

- \* Please delete the word(s) which are not applicable.
  - # Applicable in the case of SC/ST Persons who have migrated from another State/UT.
- IMPORTANT NOTES

The term "ordinarily reside(s)\*\*\*" used here will have the same meaning as in Section 20 of the Representation of the People Act, 1950.

Officers competent to issue Caste/Tribe certificates:

1. District Magistrate / Additional District Magistrate / Collector / Deputy Commissioner / Additional Deputy Commissioner / Deputy Collector / Ist Class Stipendiary Magistrate / City Magistrate / Sub-Divisional Magistrate / Taluka Magistrate / Executive Magistrate / Extra Assistant Commissioner.
2. Chief Presidency Magistrate / Additional Chief Presidency Magistrate / Presidency Magistrate.
3. Revenue Officers not below the rank of Tehsildar.
4. Sub-divisional Officer of the area where the candidate and/ or his family normally reside(s).
5. Administrator / Secretary to Administrator / Development Officer (Lakshdweep Island).
6. Certificate issued by any other authority will be rejected.

## APPENDIX- 5

This is to certify that Shri / Smt. / Kum\*. \_\_\_\_\_ Son /  
Daughter\* of Shri / Smt.\* \_\_\_\_\_ of Village/Town\*  
\_\_\_\_\_ District/Division\* \_\_\_\_\_ in the  
\_\_\_\_\_ State belongs to the \_\_\_\_\_

### community which is recognized as a backward class under:

- (i) Resolution No. 12011/68/93-BCC(C) dated 10/09/93 published in the Gazette of India Extraordinary Part I Section I No. 186 dated 13/09/93.
- (ii) Resolution No. 12011/9/94-BCC dated 19/10/94 published in the Gazette of India Extraordinary Part I Section I No. 163 dated 20/10/94.
- (iii) Resolution No. 12011/7/95-BCC dated 24/05/95 published in the Gazette of India Extraordinary Part I Section I No. 88 dated 25/05/95.
- (iv) Resolution No. 12011/96/94-BCC dated 9/03/96.
- (v) Resolution No. 12011/44/96-BCC dated 6/12/96 published in the Gazette of India Extraordinary Part I Section I No. 210 dated 11/12/96.
- (vi) Resolution No. 12011/13/97-BCC dated 03/12/97.
- (vii) Resolution No. 12011/99/94-BCC dated 11/12/97.
- (viii) Resolution No. 12011/68/98-BCC dated 27/10/99.
- (ix) Resolution No. 12011/88/98-BCC dated 6/12/99 published in the Gazette of India Extraordinary Part I Section I No. 270 dated 06/12/99.
- (x) Resolution No. 12011/36/99-BCC dated 04/04/2000 published in the Gazette of India Extraordinary Part I Section I No. 71 dated 04/04/2000.
- (xi) Resolution No. 12011/44/99-BCC dated 21/09/2000 published in the Gazette of India Extraordinary Part I Section I No. 210 dated 21/09/2000.
- (xii) Resolution No. 12015/9/2000-BCC dated 06/09/2001.
- (xiii) Resolution No. 12011/1/2001-BCC dated 19/06/2003.
- (xiv) Resolution No. 12011/4/2002-BCC dated 13/01/2004.
- (xv) Resolution No. 12011/9/2004-BCC dated 16/01/2006 published in the Gazette of India Extraordinary Part I Section I No. 210 dated 16/01/2006.

Shri / Smt. / Kum. \_\_\_\_\_ and / or his family ordinarily reside(s) in the \_\_\_\_\_ District / Division of \_\_\_\_\_ State. This is also to certify that **he/she does not belong to the persons/sections (Creamy Layer)** mentioned in Column 3 of the Schedule to the Government of India, Department of Personnel & Training O.M. No. 36012/22/93-Estt.(SCT) dated 08/09/93 which is modified vide OM No. 36033/3/2004 Estt.(Res.) dated 09/03/2004, further modified vide OM No. 36033/3/2004-Estt. (Res.) dated 14/10/2008 or the latest notification of the Government of India.

Dated:

District Magistrate /  
Deputy Commissioner /  
Competent Authority

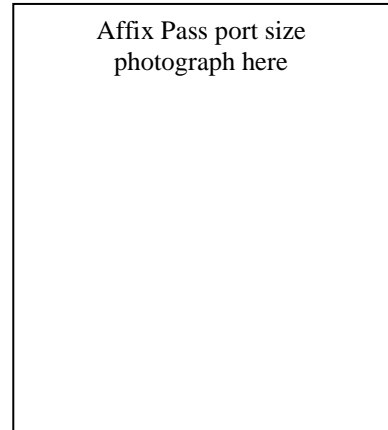
Seal

\* Please delete the word(s) which are not applicable.

### NOTE:

- (a) The term 'Ordinarily resides' used here will have the same meaning as in Section 20 of the Representation of the People Act, 1950.
- (b) The authorities competent to issue Caste Certificates are indicated below:
  - (i) District Magistrate / Additional Magistrate / Collector / Deputy Commissioner / Additional Deputy Commissioner / Deputy Collector / Ist Class Stipendiary Magistrate / Sub-Divisional magistrate / Taluka Magistrate / Executive Magistrate / Extra Assistant Commissioner (not below the rank of Ist Class Stipendiary Magistrate).
  - (ii) Chief Presidency Magistrate / Additional Chief Presidency Magistrate / Presidency Magistrate.
  - (iii) Revenue Officer not below the rank of Tehsildar' and
  - (iv) Sub-Divisional Officer of the area where the candidate and / or his family resides.

NAME & ADDRESS OF THE INSTITUTE/HOSPITAL:



Certificate No. \_\_\_\_\_ Date: \_\_\_\_\_

**DISABILITY CERTIFICATE**

This is certified that Shri/Smt/Kum \_\_\_\_\_ son/wife/daughter of Shri \_\_\_\_\_ age \_\_\_\_\_ sex \_\_\_\_\_ identification marks (s) \_\_\_\_\_ is suffering from permanent disability of following category:

**A. Locomotor or cerebral palsy:**

- i) BL-Both legs affected but not arms.
- ii) BA-Both arms affected
  - a. Impaired reach
  - b. Weakness of grip
- iii) BLA-Both legs and both arms affected
- iv) OL-One leg affected (right or left)
  - a. Impaired reach
  - b. Weakness of grip
  - c. Ataxic
- v) OA-One arm affected
  - a. Impaired reach
  - b. Weakness of grip
  - c. Ataxic
- vi) BH-Stiff back and hips (cannot sit or stoop)
- vii) MW-Muscular weakness and limited physical endurance.

**B. Blindness or Low Vision:**

- (i) B-Blind
- (ii) PB-Partially Blind

**C. Hearing impairment:**

- (i) D-Deaf
- (ii) PD-Partially Deaf

*(Delete the category whichever is not applicable)*

2. This condition is progressive/non-progressive/likely to improve/not likely to improve. Re-assessment of this case is not recommended/is recommended after a period of \_\_\_\_\_ years \_\_\_\_\_ months.\*

4. Sh./Smt./Kum.....meets the following physical requirement for discharge of his/her duties:-

- (i) F-can perform work by manipulating with fingers. Yes/No
- (ii) PP-can perform work by pulling and pushing. Yes/No

- (iii) L-can perform work by lifting. Yes/No
- (iv) KC-can perform work by kneeling and crouching. Yes/No
- (v) B-can perform work by bending. Yes/No
- (vi) S-can perform work by sitting. Yes/No
- (vii) ST-can perform work by standing. Yes/No
- (viii) W-can perform work by walking. Yes/No
- (ix) SE-can perform work by seeing. Yes/No
- (x) H-can perform work by hearing/speaking. Yes/No
- (xi) RW-can perform work by reading and writing. Yes/No

\*Strike out which is not applicable.

(Dr. _____)	(Dr. _____)	(Dr. _____)
Reg No.	Reg No.	Reg No.
Member	Member	Chairperson
Medical Board	Medical Board	Medical Board

Countersigned by the  
 Medical Superintendent/CMO/Head of  
 Hospital (with seal)

Recent attested  
 photograph showing  
 the disability affixed here.

Medical authority competent to issue such a certificate in the district of the applicant's residence/ the concerned medical authority in a government hospital where he/she may be undergoing or may have undergone treatment in connection with his/her disability

## WEBSITES, EMAIL ID AND FOR JEE (Advanced) - 2013

Institute	Website	Email ID
IIT Bombay	<a href="http://jeeadv.iitb.ac.in/">http://jeeadv.iitb.ac.in/</a>	jeeadv@iitb.ac.in
IIT Delhi	<a href="http://jeeadv.iitd.ac.in/">http://jeeadv.iitd.ac.in/</a>	jeeadv@admin.iitd.ac.in
IIT Guwahati	<a href="http://jeeadv.iitg.ac.in/">http://jeeadv.iitg.ac.in/</a>	<a href="mailto:jee@iitg.ernet.in">jee@iitg.ernet.in</a>
IIT Kanpur	<a href="http://jeeadv.iitk.ac.in/">http://jeeadv.iitk.ac.in/</a>	jeeadv@iitk.ac.in
IIT Kharagpur	<a href="http://jeeadv.iitkgp.ac.in/">http://jeeadv.iitkgp.ac.in/</a>	jeeadv@iitkgp.ac.in
IIT Madras	<a href="http://jeeadv.iitm.ac.in">http://jeeadv.iitm.ac.in</a>	jeeadv@iitm.ac.in
IIT Roorkee	<a href="http://jeeadv.iitr.ac.in/">http://jeeadv.iitr.ac.in/</a>	jeeadv@iitr.ernet.in

## ADDRESSES OF ZONAL IITs

Zone	Address	Phone	Fax
IIT Bombay	Chairman, JEE (Advanced) - 2013, IIT Bombay, Powai, Mumbai 400076	(022)25764063	(022)25720305
IIT Delhi	Chairman, JEE (Advanced) - 2013, IIT Delhi, Hauz Khas, New Delhi 110016	(011)26591785	(011)26581067
IIT Guwahati	Chairman, JEE (Advanced) - 2013, IIT Guwahati, Guwahati 781039	(0361)2692795	(0361)2582180
IIT Kanpur	Chairman, JEE (Advanced) - 2013, IIT Kanpur, Kanpur 208016	(0512)2597335	(0512)2590103
IIT Kharagpur	Chairman, JEE (Advanced) - 2013, IIT Kharagpur, Kharagpur 721032	(03222)282101	(03222)278242
IIT Madras	Chairman, JEE (Advanced) - 2013, IIT Madras, Chennai 600036	(044)22578220	(044)22578224
IIT Roorkee	Chairman, JEE (Advanced) - 2013, IIT Roorkee, Roorkee 247667	(01332)284272	(01332)285346

**SYLLABUS FOR APTITUDE TEST FOR B.Arch. PROGRAMMES**

**Freehand drawing:**

This would comprise of simple drawing depicting the total object in its right form and proportion, surface texture, relative location and details of its component parts in appropriate scale. Common domestic or day-to-day life usable objects like furniture, equipment, etc., from memory.

**Geometrical drawing:**

Exercises in geometrical drawing containing lines, angles, triangles, quadrilaterals, polygons, circles etc. Study of plan (top view), elevation (front or side views) of simple solid objects like prisms, cones, cylinders, cubes, splayed surface holders etc.

**Three-dimensional perception:**

Understanding and appreciation of three-dimensional forms with building elements, colour, volume and orientation. Visualization through structuring objects in memory.

**Imagination and aesthetic sensitivity:**

Composition exercise with given elements. Context mapping. Creativity check through innovative uncommon test with familiar objects. Sense of colour grouping or application.

**Architectural awareness:**

General interest and awareness of famous architectural creations – both national and international, places and personalities (architects, designers etc..) in the related domain.

**Candidates are advised to bring geometry box sets, pencils, erasers and colour pencils or crayons for the Aptitude Test.**

## LIST OF COURSES AVAILABLE IN ALL IITs AND ISM DHANBAD

Applicants must note that:

- (a) the titles of the courses listed below may be changed,
- (b) some of the listed courses may be dropped or altered
- (c) some new courses may be offered.

Therefore the list may not be considered as the final. Exact list will be made available at the time of counseling.

SN	Programme	IIT Bombay	IIT Delhi	IIT Guwahati	IIT Kanpur	IIT Kharagpur	IIT Madras	IIT Roorkee	IIT(BHU) Varanasi	ISM Dhanbad
<b>Programme B.Tech. 4 Years</b>										
1	Aerospace Engineering	•			•	•	•			
2	Agricultural & Food Engineering					•				
3	Biological Sciences and Bioengineering				•					
4	Biotechnology			•				•		
5	Biotechnology & Biochemical Engineering					•				
6	Ceramic Engineering								•	
7	Chemical Engineering	•	•	•	•	•	•	•	•	•
8	Chemical Science and Technology			•						
9	Civil Engineering	•	•	•	•	•	•	•	•	
10	Computer Science & Engineering	•	•	•	•	•	•	•	•	•
11	Electrical Engineering	•	•		•	•	•	•	•	•
12	Electrical Engineering (Power)		•							
13	Electronics Engineering								•	
14	Electronics & Communication Engineering			•				•		•
15	Electronics & Electrical Communication Engineering					•				
16	Electronics & Electrical Engineering			•						
17	Engineering Physics	•	•	•			•			
18	Environmental Engineering									•
19	Industrial Engineering					•				
20	Instrumentation Engineering					•				
21	Manufacturing Science and Engineering					•				
22	Materials Science and Engineering				•					
23	Metallurgical & Materials Engineering					•	•	•		
24	Mathematics and Computing			•						
25	Mechanical Engineering	•	•	•	•	•	•	•	•	•
26	Metallurgical Engineering								•	
27	Metallurgical Engineering & Materials Science	•					•			
28	Mineral Engineering									•
29	Mining Engineering					•			•	•
30	Mining Machinery Engineering									•
31	Naval Architecture & Ocean Engineering						•			



32	Ocean Engineering & Naval Architecture						•				
33	Petroleum Engineering										•
34	Polymer Science and Technology								•		
35	Production and Industrial Engineering		•						•		
36	Pulp & Paper Technology								•		
37	Textile Technology		•								
<b>Four- year B.S. Courses</b>											
38	Chemistry					•					
39	Economics					•					
40	Mathematics and Scientific Computing					•					
41	Physics					•					
<b>B. Pharm. 4 Years</b>											
42	Pharmaceutics										•
<b>B. Des. 4 years</b>											
43	Design			•							
<b>B. Arch. 5 years</b>											
44	Architecture					•			•		
<b>M. Pharm. Dual Degree 5 years</b>											
45	Pharmaceutics										•
<b>M.Sc. Integrated 5 years</b>											
46	Applied Geology					•					
47	Applied Mathematics								•		
48	Applied Physics										
49	Chemistry	•				•			•		
50	Economics					•					
51	Exploration Geophysics					•					
52	Mathematics and Computing					•					•
53	Physics					•			•		
<b>BS &amp; MS Dual Degree 5 years</b>											
54	Physics								•		
55	Biological Sciences								•		
<b>M.Sc. Tech. Integrated 5 years</b>											
56	Applied Geology										•
57	Applied Geophysics										•
<b>M.Tech. Integrated 5 year</b>											
58	Geological Technology								•		
59	Geophysical Technology								•		
60	Engineering Physics										•
61	Industrial Chemistry										•
62	Mathematics & Computing		•								•
<b>B.Tech./M.Tech. Dual Degree 5 Years</b>											
63	Aerospace Engineering					•		•			
64	Aerospace Engineering with M.Tech. in Applied Mechanics with specializations in Biomedical Engineering							•			
65	Agricultural and Food Engineering with M.Tech in any of the listed specializations					•					
66	Biochemical Engineering										•
67	Biological Engineering							•			
68	Biochemical Engineering & Biotechnology		•								

69	Bioengineering with M.Tech. in Biomedical Technology								•	
70	Biotechnology								•	
71	Biotechnology & Biochemical Engineering							•		
72	Ceramic Engineering									•
73	Chemical Engineering	•	•					•	•	
74	Chemical Engineering with M. Tech. In Hydrocarbon Engineering									•
75	Civil Engineering with M. Tech. In Applied Mechanics in any of the listed specialization								•	
76	Civil Engineering with M. Tech. In Infrastructural Civil Engineering								•	
77	Civil Engineering with M. Tech. In Structural Engineering									•
78	Civil Engineering with M. Tech. In any of the listed specialization							•	•	
79	Computer Science & Engineering		•					•	•	•
80	Computer Science & Engineering with M. Tech. In Information Technology									
81	Electrical Engineering with M. Tech. In Applied Mechanics with specialization in Biomedical Engineering								•	
82	Electrical Engineering with M. Tech. In Communications and Signal Processing	•								
83	Electrical Engineering								•	
84	Electrical Engineering with M. Tech. In Information & Communication Technology		•							
85	Electrical Engineering with M. Tech. In Microelectronics	•								
86	Electrical Engineering with M. Tech. In Micro-electronics & VLSI Design									
87	Electrical Engineering with M. Tech. In any of the listed specializations							•		
88	Electrical Engineering with M.Tech. in Power Electronics									•
89	Electrical Engineering with M. Tech. In Power Systems and Power Electronics									•
90	Electronics & Communication Engineering with M. Tech. In Wireless Communication									•
91	Electronics & Electrical Communication Engineering with M. Tech. In any of the listed specializations								•	
92	Energy Engineering with M.Tech in Energy Systems Engineering	•								
93	Engineering Design with M. Tech. In Automotive Engineering								•	
94	Engineering Design with M.Tech in Biomedical Design								•	
95	Quality Engineering Design and Manufacturing								•	
96	Engineering Physics with M.Tech in Engineering Physics with specialization in Nano Science	•								
97	Industrial Engineering with M. Tech. In Industrial Engineering and Management								•	
98	Manufacturing Science & Engineering with M. Tech. In Industrial Engineering & Management								•	
99	Material Science & Technology									•
100	Mechanical Engineering									•
101	Mechanical Engineering with M. Tech. In Computer Aided Design & Automation	•								
102	Mechanical Engineering with M. Tech. In Computer Integrated Manufacturing	•								

103	Mechanical Engineering with M. Tech. In Thermal Engineering						•			
104	Mechanical Engineering with M. Tech. In Intelligent Manufacturing						•			
105	Mechanical Engineering with M. Tech. In Product Design						•			
106	Mechanical Engineering with M. Tech. In any of the listed specialization					•				
107	Metallurgical Engineering								•	
108	B. Tech. In Metallurgical and Materials Engineering and M. Tech. In Materials Engineering							•		
109	Metallurgical Engineering & Materials Science with M. Tech. in Ceramics & Composites	•								
110	Metallurgical Engineering & Materials Science with M. Tech. in Metallurgical Process Engineering	•								
111	Metallurgical & Materials Engineering						•			
112	Metallurgical & Materials Engineering with M. Tech. in Metallurgical & Materials Engineering					•				
113	Mineral Engineering with M.Tech. in Mineral Engineering									•
114	Mineral Engineering with MBA									•
115	Mining Engineering					•			•	
116	Mining Engineering with M.Tech. in Mining Engineering									•
117	Mining Engineering with MBA									•
118	Mining Engineering with M.Tech. in Safety Engineering and Disaster Management in Mines					•				
119	Naval Architecture & Ocean Engineering						•			
120	Naval Architecture Engineering with M.Tech. in Applied Mechanics in any of the listed specializations						•			
121	Ocean Engineering & Naval Architecture					•				
122	Petroleum Engineering with M.Tech. in Petroleum Management									•
123	Process Engineering with MBA							•		

<b>Programme B.Tech. 4 Years</b>										
SN	Programme B.Tech. 4 Years	IIT Bhubaneswar	IIT Gandhinagar	IIT Hyderabad	IIT Indore	IIT Mandi	IIT Patna	IIT Ropar	IIT Rajasthan	
1	Chemical Engineering		•	•						
2	Civil Engineering	•		•						
3	Computer Science and Engineering			•	•	•	•	•	•	•
4	Engineering Science			•						
5	Electrical Engineering	•	•	•	•	•	•	•	•	•
6	Mechanical Engineering	•	•	•	•	•	•	•	•	•
7	Systems Science									•
8	Biologically-inspired Systems Science									•

## APPENDIX-10

### IMPORTANT DATES

Start of Online Application for JEE(Main) – 2013	8 Nov. (Thursday) 2012
<b>Closing of Online Application Process</b>	<b>15 Dec. (Saturday) 2012</b>
<b>JEE (Main)- 2013</b>	<b>7 April (Sunday) 2013</b>
<b>Results of JEE (Main)-2013</b>	<b>7 May (Tuesday) 2013</b>
Opening of website for eligible candidates to register for JEE(Advanced) - 2013	8 May (Wednesday) – 13 May (Monday) 2013
<b>Opening of website for payment of registration fee for JEE (Advanced) – 2013</b>	8 May (Wednesday) – 13 May (Monday) 2013
Downloading of Admit cards by candidates from zonal IIT JEE (Advanced) – 2013 Portal	16 May (Thursday) - 31 May (Friday) 2013
<b>JEE (Advanced) – 2013</b>	<b>2 June (Sunday) 2013</b>
Declaration of Results (including Preparatory) through website	23 June (Sunday) 2013
Online registration open for registering for courses and for appearing Architecture Aptitude Test	24 June (Monday) – 25 June (Tuesday) 2013
<b>Architecture Aptitude Test</b>	<b>28 June (Friday) 2013</b>
Declaration of Architecture Aptitude Test results	2 July (Tuesday) 2013