



**ALL INDIA ONLINE TEST SERIES**  
**IIT JAM CHEMISTRY 2020**  
**STARTING – Aug 2019**

**57 TESTS: 31 Unitwise Practice Test + 13 Minor Test + 5 Major Test + 3 Part Test + 5 Full Length Tests**

**Value Addition Material + Supplementary Material: Soft copy & Hard copy (Expert Support: Telephonic Discussion/ Email Interaction)**

**Program Objective:** This is a comprehensive and intensive ‘interactive’ program focussing on sincere IIT JAM Aspirants who will appear in IIT JAM 2020 . Our experts provide steps by step guidance to aspirants for understanding the concepts chemistry and preparing them for scoring good marks.

**Approach & Strategy:** Our Simple, practical and focussed approach will help aspirants understand the demand of IIT JAM Exam effectively. Our strategy is to constantly innovate to keep the preparation process dynamic and give personalized attention to individual aspirants based on factor core competence, availability of time and resource and the requirement of IIT JAM Exam.

**Our interactive Learning approach (Email/Telephonic Discussion: Expert with Aspirants) will continuously improve aspirant’s performance and move their preparation in the right direction.**

**Number of Mock Test: 57 TESTS: 31 Unitwise + 13 Minor + 5 Major + 3 Part + 5 Full Length**

**Fee (Incl. all taxes): Rs 4500/-**

**Nature Flexible- Date of Mock Test: Reschedule on the demand of aspirants. (POSTPONE, BUT NOT PREPONE)**

**What you will get:**

- Login ID Password for performance analysis of aspirants. (Innovative Assessment System including POST TEST ANALYSIS)
- 57 Mock Test Papers & detailed conceptual Answer Explanations.
- Analysis of Mock Test papers based on difficulty level & nature of questions.
- Comprehensive analysis of previous year questions papers.

## INNOVATIVE ASSESSMENT SYSTEM:

Static & dynamic Potential of Mock test papers (Scoring Potential). Macro & Micro performance Analysis of aspirants, Section wise analysis, Difficulty Analysis, All India Rank, comparison with toppers, Geographical Analysis, Integrated Score Card, Analysis of Mock Test paper based on difficulty level & nature of question etc.

**HOW IT WORKS: The tests are planned at Five different levels of preparation required for a student to succeed in IIT JAM.**

**1. Unit level- Test 1 to 31:** Each test will be based entirely on the most unit sources of that particular section. Here we will test whether you have thoroughly prepared these unit sources or not and if you have understood all the basic concepts or not. These tests will be available on Chem Academy Portal right from your date of enrolment, you can give these test anytime as per your convenience. These papers are developed in order to boost your foundation and effective preparation of every particular unit mentioned in IIT JAM Syllabus. These are three hour tests each containing 60 questions based on IIT JAM Syllabus and Pattern.

**2. Applied level (Minor, Major) – Test 32 to 44 & 45 to 49:** In this level, we will test your subject knowledge at an applied level. Test would be more analytical in nature, application oriented with relevance to recent concepts. These tests would not be restricted to few particular sources and it would cover the entire primary, Secondary and other sources. These tests are of 3 hours, each containing as expected 60 questions pertaining to Chemistry subject.

**3. Comprehensive level ( Part and Full test) -Test 50 to 52 AND 53 TO 57:** These are Full Length (FLT) covering all the levels of difficulty and all the types of questions similar to the IIT JAM paper. These tests will validate that your preparation is complete and you have achieved that extra edge to succeed in IIT JAM. Part test will again comprise of 100 questions each. In Part Tests number of topics (from each Physical, Inorganic and Organic Chemistry) are more compared to Major tests and eventually in Full tests you will have 60 questions from complete syllabus.

## **DISCLAIMER**

- **Chem academy material is for the individual only. In case a student is found involved in any violation of copyrights of Chem academy material, the admission to the test series will be cancelled.**
- **We have facility of fee payment in cash too.**
- **Fee once paid is non-refundable and non-transferable in all circumstances**
- **Chem academy reserves all rights related to admission.**
- **Chem academy reserves all rights to make any changes in test series schedule/ test writing days and timing etc., if need so arises.**

### **UNITWISE SYLLABUS, CONTENT & STANDARD REFERENCES**

<b>Unit No.</b>	<b>Topics</b>	<b>Syllabus covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)</b>	<b>Primary (Essential) Reference</b>	<b>Secondary (Additional) Reference</b>
1	Basic Mathematical Concepts	Functions; maxima and minima integrals; ordinary differential equations, vectors and matrices, determinants, Elementary statistics and probability theory	11 <sup>th</sup> , 12 <sup>th</sup> NCERT	RD Sharma
2	Atomic and Molecular Structure	Fundamental particles; Bohr's theory of hydrogen-like atom; wave – particle duality; uncertainty principle; Schrodinger's wave equation; quantum numbers; shapes of orbitals; Hund's rule and Pauli's exclusion principle; electronic configuration of simple homonuclear diatomic molecules	11 <sup>th</sup> NCERT, class notes, Chem Academy (DLP Kit)	Peter Atkins, Engel & Reid,
3	Basic organic chemistry/GOC	Electronic effects (resonance, inductive, hyperconjugation, Aromaticity) and steric effects and its applications (acid/base property).	11 <sup>th</sup> , 12 <sup>th</sup> NCERT, Classnotes, Chem Academy (DLP Kit)	Paula Bruise, Carey Sandberg, Jerry March
4	Theory of gases	Equation of state for ideal and non-ideal (vander Waals) gases; Kinetic theory of gases; Maxwell-Boltzmann distribution law; equipartition of energy	11 <sup>th</sup> NCERT, class notes, Chem Academy JAM (DLP Kit)	K L Kapoor Engel & Reid, Charles Mortimer
5	Stereochemistry	Optical isomerism in compounds with and without any stereocenters (allenes, biphenyls); conformation of acyclic systems (substituted ethane/ <i>n</i> -propane/ <i>n</i> -butane) and cyclic systems (mono- and di-substituted cyclohexanes).	Class notes, Chem Academy (DLP Kit)	Subratosen Gupta, P S Kalsi, jonathanclayden, Ernest Eliel
6	Chemical bonding	Different types of bonding theories VSEPR, VBT and MOT, shapes of molecules, hybridization, dipole moment	11 <sup>th</sup> NCERT, Class notes Chem Academy (DLP Kit)	HueeyKieter, Shriver Atkins, MiesslerTarr E. Housecraft
7	Colligative properties	Dilute solutions; lowering of vapour pressure, Raoult's and Henry's Laws and their applications. Excess thermodynamic functions. Thermodynamic derivation using chemical potential to derive relations between the four colligative	12 <sup>th</sup> NCERT Class notes Chem Academy (DLP Kit)	K.L Kapoor, Puri-Sharma-Pathania, R.CMu kherjii, Martin siberberg

Unit No.	Topics	Syllabus covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)	Primary (Essential) Reference	Secondary (Additional) Reference
		properties [(i) relative lowering of vapour pressure, (ii) elevation of boiling point, (iii) Depression of freezing point, (iv) osmotic pressure] and amount of solute. Applications in calculating molar masses of normal, dissociated and associated solutes in solution.		
8	Solid state	Crystals and crystal systems; X-rays; NaCl and KCl structures; close packing; atomic and ionic radii; radius ratio rules; lattice energy; Born-Haber cycle; isomorphism; heat capacity of solids.	12 <sup>th</sup> NCERT Class notes, Chem Academy ( DLP Kit )	K L Kapoor, Hueey, Castellen, Charles Mortimer
9	Reaction mechanism	Nucleophilic and electrophilic substitution (SN1,SN2, SNi, E1,E2,E1cb, anchimeric assistance)	12 <sup>th</sup> NCERT Class notes, Chem Academy JAM ( DLP Kit )	Jonathan clayden, paulabruice, Carey Sandberg, George Zweifel
10	Chemical thermodynamics	Reversible and irreversible processes; first law and its application to ideal and nonideal gases; thermochemistry; second law; entropy and free energy; criteria for spontaneity.	11 <sup>th</sup> NCERT Class notes, Chem Academy JAM ( DLP Kit)	K L Kapoor, Peter Atkin, Castellen, Charles Mortimer, Ira Lavine
11	Aromatic Electrophilic and Nucleophilic substitution Addition elimination reactions	Nitration,sulphonation,halogenations Di and tri electrophilic substitution in benzene rings and fused polycyclic rings systems	12 <sup>th</sup> NCERT Class notes, Chem Academy JAM ( DLP Kit)	Jonathan clayden, Peter Sykes,Carey Sandberg, George Zweifel Jerry March
12	Periodic properties of elements	Periodic classification of elements and periodicity in properties; general methods of isolation and purification of elements	11 <sup>th</sup> NCERT class notes, Chem Academy JAM ( DLP Kit)	Shriver Atkins, Cathrine E Housecraft, MiesslerTarr, Hueeykieter
13	Reaction Intermediates	Chemistry of reactive intermediates (carbocations, carbanions, free radicals, carbenes, nitrenes, benzynes etc ...)	class notes, Chem academy JAM (DLP Kit)	Peter Sykes, Jonathan clayden, Jerry March, George Zweifel, Ernest Eliel

Unit No.	Topics	Syllabus covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)	Primary (Essential) Reference	Secondary (Additional) Reference
14	Main group elements	General concepts on group relationships and gradation in properties; structure of electron deficient compounds involving main group elements	11 <sup>th</sup> , 12 <sup>th</sup> NCERT, Classnotes, Chem academy JAM (DLP Kit)	Hueey, Shriver Atkins, GreenWood, Cotton & Wilkinson, Ajay Kumar
15	Chemical Equilibrium	Criteria of thermodynamic equilibrium, degree of advancement of reaction, chemical equilibria in ideal gases, concept of fugacity. Thermodynamic derivation of relation between Gibbs free energy of reaction and reaction quotient. Coupling of exoergic and endoergic reactions. Equilibrium constants and their quantitative dependence on temperature, pressure and concentration. Freeenergy of mixing and spontaneity; thermodynamic derivation of relations between the various equilibrium constants $K_p$ , $K_c$ and $K_x$ . Le Chatelier principle (quantitative treatment); equilibrium between ideal gases & a pure condensed phase.	11 <sup>th</sup> NCERT, Class notes, Chem academy JAM (DLP Kit)	Peter Atkins, K L Kapoor Ira Levine, Charles Mortimer, Castellen
16	Reagents	Oxidation and reduction reactions (Clemmensen, Wolff-Kishner, $\text{LiAlH}_4$ , $\text{NaBH}_4$ , MPV, PDC and PGC etc) in organic chemistry, organometallic reagents in organic synthesis (Grignard, organolithium and organocopper).	Class notes, Chem academy JAM (DLP Kit)	Jerry March, Paula Bruce, Carey Sandberg, Carruthers Jonathan clayden, George Zweifel
17	D Block elements	Characteristics of 3d elements; oxide, hydroxide and salts of first row metals	12 <sup>th</sup> NCERT, Chem academy JAM (DLP Kit)	Ajay kumar, MiesslerTarr, GreenWood, Cotton & Wilkinson, shriver Atkins

Unit No.	Topics	Syllabus covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)	Primary (Essential) Reference	Secondary (Additional) Reference
18	Ionic equilibrium	Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono-, di- and tri-protic acids (exact treatment). Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications; buffer capacity, buffer range, buffer action and applications of buffers in analytical chemistry, biochemical processes in the human body. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle. Theory of acid – base indicators; selection of indicators & their limitations. Multistage equilibria in polyelectrolyte systems; hydrolysis and hydrolysis constants	11 <sup>th</sup> NCERT Class notes, Chem academy JAM ( DLP Kit)	K.L Kapoor, Puri-Sharma- Pathania, Charles Mortimer, R.C Mukherji
19	Radioactivity	nuclear theories, nuclear reactions, applications of isotopes.	Class notes, Chem academy JAM ( DLP Kit)	Asim K Das vol 1, Puri-Sharma pathania,
20	Phase equilibrium	Concept of phases, components and degrees of freedom, derivation of Gibbs Phase Rule for non-reactive & reactive systems; Clausius-Clapeyron equation and its applications to solid-liquid, liquid-vapour and solid vapour equilibria, phase diagram for one component systems, with applications. Phase diagrams for systems of solid-liquid equilibria	Class notes, Chem academy JAM ( DLP Kit)	Castellen, Charles Mortimer, Peter Atkins, K L Kapoor

Unit No.	Topics	Syllabus covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)	Primary (Essential) Reference	Secondary (Additional) Reference
		involving eutectic, congruent and incongruent meltingpoints, solid solutions. Binary solutions: Gibbs-Duhem-Margules equation, its derivation and applications to fractional distillation of binary miscible liquids (ideal and nonideal), azeotropes, lever rule, partial miscibility of liquids, CST, miscible pairs, steam distillation. Nernst distribution law: its derivation and applications.		
21	Name reactions and rearrangements	Hofmann-Curtius-Lossen rearrangement, Wolff rearrangement, Simmons-Smith reaction, Reimer-Tiemann reaction, Michael reaction, Darzens reaction, Wittig reaction and McMurry reaction; Pinacol-pinacolone, Favorskii, benzylic acid rearrangement, dienone-phenol rearrangement, Baeyer-Villiger reaction etc.	12 <sup>th</sup> NCERT, Class notes, Chem academy JAM (DLP Kit)	George Zweifel, Ernest Eliel, Carey Sandberg, Paula Bruice, Jonathan Clayden, I. L. Finar
22	Titration	Acid-base, oxidation-reduction and complexometric titrations using EDTA; precipitation reactions	Physical chemistry (wiley) JEE book Classnotes	K L Kapoor, Puri-Sharma-pathania
23	Electrochemistry	Galvanic cells; EMF and free energy, concentration cells with and without transport; polarography; concentration cells with and without transport.	12 <sup>th</sup> NCERT Class notes, Chem Academy JAM (DLP Kit)	K L Kapoor, Engel & Reid, Castellen, Charles Mortimer, Ira Levine
24	Pericyclic Reactions	Diels-Alder, electrocyclic and sigmatropic reactions.	Class notes, Chem Academy JAM (DLP Kit)	Jonathan Clayden, Paul Bruice, C. Sandberg, Jerry March, George Zweifel
		Structure, isomerism, reaction	12 <sup>th</sup> NCERT,	Huey Kieter,

Unit No.	Topics	Syllabus covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)	Primary (Essential) Reference	Secondary (Additional) Reference
25	Coordination complexes	mechanism and electronic spectra; VB, MO and Crystal Field theoretical approaches for structure, color and magnetic properties of metal complexes	Class notes, Chem academy JAM (DLP Kit)	shriverandatkings, MiesslerTarr, Catherine E.Housecraft, G.Lawrence.
26	Conductance	Conductance and its applications; transport number, Debye-Huckel-Onsagar theory of strong electrolytes.	12 <sup>th</sup> NCERT Chem academy JAM (DLP Kit)	Castellen, Charles Mortimer, K L Kapoor Puri-Sharma-Pathania
27	Aromatic and Hetrocyclic chemistry	Monocyclic, bicyclic and tricyclic aromatic hydrocarbons, and monocyclic compounds with one hetero atom: synthesis, reactivity and properties.	Class notes, Chem academy JAM (DLP Kit)	Jonathan clayden, S P Bhutani, John Joule and Keith Mills, Beena Negi and R.K Parashar
28	Bio inorganic	Essentials and trace elements of life; basic reactions in the biological systems and the role of metal ions, especially Fe <sup>2+</sup> , Fe <sup>3+</sup> , Cu <sup>2+</sup> and Zn <sup>2+</sup> ; structure and function of hemoglobin and myoglobin and carbonic anhydrase	Class notes, Chem academy JAM (DLP Kit)	Hueey, Asim K Das, Stephen J. Lippard, J D Lee
29	Chemical kinetics	Reactions of various order; Arrhenius equation; collision theory; transition state theory; chain reactions - normal and branched; enzyme kinetics	12 <sup>th</sup> NCERT Class notes, Chem academy JAM (DLP Kit)	K L Kapoor, Castellen, Charles Mortimer, Peter Atkins, Ira Levine, Laidler, Engel & Reid
30	Qualitative Organic Analysis	Identification of functional groups by chemical tests; elementary UV, IR and <sup>1</sup> H NMR spectroscopic techniques as tools for structural elucidation.	Class notes, Chem academy JAM (DLP Kit) Y R Sharma, JDS Yadev	Clayden, Pavia, Lampman, kriz, C.Banwell, Silversteen.
		Basic principles;		



Unit No.	Topics	Syllabus covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)	Primary (Essential) Reference	Secondary (Additional) Reference
31	Instrumental Method of Analysis	instrumentations and simple applications of conductometry, potentiometry and UV-vis spectrophotometry; analysis of water, air and soil samples.	Chem academy Booklet and class notes	R S Khandpur, Skoog.
32	Adsorption	Gibbs adsorption equation; adsorption isotherm; types of adsorption; surface area of adsorbents; surface films on liquids	12 <sup>th</sup> NCERT Pradeep's class notes, Chem academy JAM (DLP Kit)	K L Kapoor, Puri Sharma Pathania, Castellen
33	Natural Products Chemistry	Chemistry of alkaloids, steroids, terpenes, carbohydrates, amino acids, peptides and nucleic acids	Class notes, Chem academy JAM (DLP Kit)	Jonathan Clayden, Paula Bruice, S P Bhutani, Sujata V bhat, Yang Ye, SPBhutani
34	Analytical chemistry	Principles of qualitative and quantitative analysis	Class notes, Chem academy JAM (DLP Kit)	F.W. Fifield, Jessica Carol
35	Photochemistry	Photochemical processes, Quantum yield	Class notes, Chem academy JAM (DLP Kit)	K L Kapoor, Puri Sharma Pathania, Castellen, Laidler
36	Spectroscopy	Beer-Lambert law; fundamental concepts of rotational, vibrational, electronic and magnetic resonance spectroscopy	Class notes & Chem academy (DLP Kit)	Banwell, K L Kapoor, Levine, Peter Atkin, Charles Mortimer
37	Organometallic	Organometallic compounds having ligands with back bonding capabilities such as metal carbonyls, carbenes, nitrosyls and metallocenes; homogenous catalysis.	Class notes & Chem academy (DLP Kit)	Huey, Atkins, Greenwood, Housecraft, J. Hartwig, Crabtree, Elias, Asim K Das

**UNITWISE TOPICS TEST SCHEDULE**

TEST No.	Syllabus	Topic covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)
1	Basic Mathematical Concepts	Functions; maxima and minima, integrals; ordinary differential equations; vectors and matrices, determinants, Elementary statistics and probability theory
2	Atomic and Molecular Structure	Fundamental particles; Bohr's theory of hydrogen-like atom; wave – particle duality; uncertainty principle; Schrodinger's wave equation; quantum numbers; shapes of orbitals; Hund's rule and Pauli's exclusion principle; electronic configuration of simple homonuclear diatomic molecules
3	Basic organic chemistry/GOC	Electronic effects (resonance, inductive, hyperconjugation, Aromaticity) and steric effects and its applications (acid/base property).
4	Theory of gases	Equation of state for ideal and non-ideal (vander Waals) gases; Kinetic theory of gases; Maxwell-Boltzmann distribution law; equipartition of energy
5	Stereochemistry	Optical isomerism in compounds with and without any stereocenters (allenes, biphenyls); conformation of acyclic systems (substituted ethane/ <i>n</i> -propane/ <i>n</i> -butane) and cyclic systems (mono- and di-substituted cyclohexanes).
6	Chemical bonding	Different types of bonding theories VSEPR, VBT and MOT, shapes of molecules, hybridization, dipole moment
7	Solid state	Crystals and crystal systems; X-rays; NaCl and KCl structures; close packing; atomic and ionic radii; radius ratio rules; lattice energy; Born-Haber cycle; isomorphism; heat capacity of solids.
8	Reaction mechanism	Nucleophilic and electrophilic substitution (SN1, SN2, SNi, E1, E2, E1cb, anchimeric assistance)
9	Chemical thermodynamics	Reversible and irreversible processes; first law and its application to ideal and nonideal gases; thermochemistry; second law; entropy and free energy; criteria for spontaneity.
10	Aromatic Electrophilic and Nucleophilic substitution Addition elimination reactions	Nitration, sulphonation, halogenations Di and tri electrophilic substitution in benzene rings and fused polycyclic rings systems
11	Periodic properties of elements	Periodic classification of elements and periodicity in properties; general methods of isolation and purification of elements
12	Reaction Intermediates	Chemistry of reactive intermediates (carbocations, carbanions, free radicals, carbenes, nitrenes, benzyne etc ...)
13	Main group elements	General concepts on group relationships and gradation in properties; structure of electron deficient compounds involving main group elements
		Criteria of thermodynamic equilibrium, degree of advancement of reaction, chemical equilibria in ideal gases, concept of fugacity. Thermodynamic derivation of

TEST No.	Syllabus	Topic covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)
14	Chemical Equilibrium	relation between Gibbs free energy of reaction and reaction quotient. Coupling of exoergic and endoergic reactions. Equilibrium constants and their quantitative dependence on temperature, pressure and concentration. Free energy of mixing and spontaneity; thermodynamic derivation of relations between the various equilibrium constants $K_p$ , $K_c$ and $K_x$ . Le Chatelier principle (quantitative treatment); equilibrium between ideal gases & a pure condensed phase.
15	Reagents	Oxidation and reduction reactions (Clemmensen, Wolff-Kishner, $\text{LiAlH}_4$ , $\text{NaBH}_4$ , MPV, PDC and PGC etc) in organic chemistry, organometallic reagents in organic synthesis (Grignard, organolithium and organocopper).
16	Ionic equilibrium	Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono-, di- and tri-protic acids (exact treatment). Salt hydrolysis - calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications; buffer capacity, buffer range, buffer action and applications of buffers in analytical chemistry, biochemical processes in the human body. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle. Theory of acid – base indicators; selection of indicators & their limitations. Multistage equilibria in polyelectrolyte systems; hydrolysis and hydrolysis constants
17	Radioactivity	nuclear theories, nuclear reactions, applications of isotopes.
	Titrations	Acid-base, oxidation-reduction and complexometric titrations using EDTA; precipitation reactions
18	Bio inorganic	Essentials and trace elements of life; basic reactions in the biological systems and the role of metal ions, especially $\text{Fe}^{2+}$ , $\text{Fe}^{3+}$ , $\text{Cu}^{2+}$ and $\text{Zn}^{2+}$ ; structure and function of hemoglobin and myoglobin and carbonic anhydrase
19	Phase equilibrium	Concept of phases, components and degrees of freedom, derivation of Gibbs Phase Rule for non-reactive & reactive systems; Clausius-Clapeyron equation and its applications to solid-liquid, liquid-vapour and solid vapour equilibria, phase diagram for one component systems, with applications. Phase diagrams for systems of solid-liquid equilibria involving eutectic, congruent and incongruent melting points, solid solutions. Binary solutions: Gibbs-Duhem-Margules equation, its derivation and applications to fractional distillation of

TEST No.	Syllabus	Topic covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)
		binary miscible liquids (ideal and nonideal), azeotropes, lever rule, partial miscibility of liquids, CST, miscible pairs, steam distillation. Nernst distribution law: its derivation and applications.
20	Name reactions and rearrangements	Hofmann-Curtius-Lossen rearrangement, Wolff rearrangement, Simmons-Smith reaction, Reimer-Tiemann reaction, Michael reaction, Darzens reaction, Wittig reaction and McMurry reaction; Pinacol-pinacolone, Favorskii, benzilic acid rearrangement, dienone-phenol rearrangement, Baeyer-Villiger reaction etc.
21	Electrochemistry	Galvanic cells; EMF and free energy, concentration cells with and without transport; polarography; concentration cells with and without transport.
	Conductance	Conductance and its applications; transport number, Debye-Huckel-Onsager theory of strong electrolytes.
22	Pericyclic Reactions	Diels-Alder, electrocyclic and sigmatropic reactions.
23	Coordination complexes	Structure, isomerism, reaction mechanism and electronic spectra; VB, MO and Crystal Field theoretical approaches for structure, color and magnetic properties of metal complexes
	D Block elements	Characteristics of 3d elements; oxide, hydroxide and salts of first row metals
24	Aromatic and Heterocyclic chemistry	Monocyclic, bicyclic and tricyclic aromatic hydrocarbons, and monocyclic compounds with one hetero atom: synthesis, reactivity and properties.

TEST No.	Syllabus	Topic covered (The list is indicative to help students; however, it is not exhaustive. A topic may have more subtopics)
25	Chemical kinetics	Reactions of various order; Arrhenius equation; collision theory; transition state theory; chain reactions - normal and branched; enzyme kinetics
	Photochemistry	Photochemical processes, Quantum yield
26	Qualitative Organic Analysis	Identification of functional groups by chemical tests; elementary UV, IR and $^1\text{H}$ NMR spectroscopic techniques as tools for structural elucidation.
27	Instrumental Method of Analysis	Basic principles; instrumentations and simple applications of conductometry, potentiometry and UV-vis spectrophotometry; analysis of water, air and soil samples.
	Analytical chemistry	Principles of qualitative and quantitative analysis
28	Adsorption	Gibbs adsorption equation; adsorption isotherm; types of adsorption; surface area of adsorbents; surface films on liquids
29	Natural Products Chemistry	Chemistry of alkaloids, steroids, terpenes, carbohydrates, amino acids, peptides and nucleic acids
30	Spectroscopy	Beer-Lambert law; fundamental concepts of rotational, vibrational, electronic and magnetic resonance spectroscopy
31	Organometallic	Organometallic compounds having ligands with back bonding capabilities such as metal carbonyls, carbenes, nitrosyls and metallocenes; homogenous catalysis.

## Revision plan

Revision is evenly all-important after thorough study of surplus syllabus of IIT JAM. There are copious concepts and students need strenuous efforts to harken back to numberless conceptual topics. Your success principally relies upon the strategy of Revision work. How seriously you do your Revision work.

Revision is done in two parts

- 1). Through studying theory and concepts written in the class notes
- 2). Application of concepts through solving the question banks (class booklet, daily assignments, Previous year JEE, JAM ,NET and GATE questions)

For getting sure success students are supposed to attend regular classes, but it is accidental that any student has 100% attendance. Usually most sincere and serious students have approx. 95% attendance and there is always unintentional absence due to some unavoidable circumstances. Beside this, most students attend 90% classes and there is always a (much expected) demand from students for respective faculty to take Revision Class in which teacher is required to discuss and solve student's problems (in booklets and other reference material, question bank etc ). Teacher will sort out each and every query regarding the topic. **He/she will suggest students very importantly how to prepare the class notes, how to do revision (orally or by making notes), solving how many questions are adequate for firm concepts, what should be your approach to complete your syllabus, what should be your study time table, how many hours needed to study daily, how to study effectively with class notes, what to study and what to leave for examination, how much you need to study, how to synchronize the notes, what to do if you stuck in understanding any concept, which type of question should be practiced, what are the recommended book, where you need reference books, at last which topic are relatively more important and should give utmost attentions etc.** These are some elementary and common hardship which students can frequently encounter. So to address these aforementioned difficulties Revision program becomes worthwhile and much needed and valuable course for every student.

Revision course at Chem Academy starts in last week of August and continues till 2<sup>nd</sup> week of November. Its is roughly a 2 and a half month program in which students from any following batches (Y,S,A,R,Z ...) can take participation. These revision classes will take place between Tuesday to Friday from 10:00 am onwards.

## ALL INDIA ONLINE TEST SERIES (AIOTS)

All India Online Test Series at Chem Academy starts from 1<sup>st</sup> June and resume till 1<sup>st</sup> week of February. Interested students are required to register validate themselves at Chem Academy for appearing in test series.

Student will get an id & password. These id / password are very important because upon using this only aspirant can become part of online test series.

Student are required to login for test an allotted date and time. Paper will be based on the same questions pattern (MCQ 1 marks, 2 marks, MSQ 2 marks, NAT 1 marks, 2 marks) and a virtual calculator as in IIT JAM exam. You can give this paper on Laptop, PC and Mobile also. Eventually you need to click an submit button for evaluation of answer sheet.

You will immediately get your score card. You get to know your

1. No. Of attempted questions.
2. Correct answer question
3. Incorrect answer question
4. Time taken
5. Average time per question
6. Accuracy
7. Negative Marks
8. All India Rank (AIR)

If somehow any student is not able to participate in test then he/she need not to worry. After 48 hours this question paper will appear on Chem Academy portal by default and absentees can give the exam and go for evaluation process. In case you have to quite amid examination session, you can simply forsake the paper (need not to click on submit button) and next time (after 48 hours) you can continue from the same place by pressing RESUME option. Once you submit the paper, you will not get another opportunity to give that exam, but of course you can visit the question papers and their correct responses, simply means every question paper can be dealt only once.

Academy will provide pdf solutions and detailed video solution of these question papers.

### FEE STRUCTURE OF AIOTS

No. of Test	Duration	Doubt Session	Fee Structure	Additional Facilities
65	6 month	Student care program + emails	4,500/-	Pdf solutions + Video solutions of test series

Unit Test - 1 (Chemical Equilibrium)

**25.66**  
Score

**1.34**  
Negative Marks

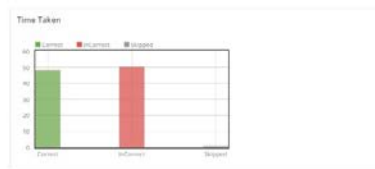
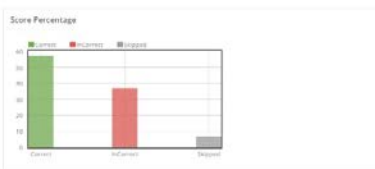
**205.00s**  
Avg. Time Per Question

**61**  
Accuracy %

Section Level Area Level Topic Level Solution Rank Rank: 22 out of 172

Score Card

Section	Questions	Time Taken	Attempt	Correct	InCorrect	Skipped	Score	Accuracy %	Percentage	Cut Off
Unit Test - 1 (Chemical Equilibrium)	30	1:35:40	28	17	11	2	25.66	60.71	-	-





### MINOR TEST SERIES & REVISION CLASS SCHEDULE

No of tests	Batch	Topic	Test Date (online)
1	Classroom Prog, DLP course, Online live course, Online Test series	Electrochemistry, Phase Equilibrium, Adsorption	04 <sup>th</sup> September (5:00 PM – 8:00 PM)
2	Classroom Prog, DLP course, Online live course, Online Test series	Metallurgy, Periodic Properties and Organometallics	09 <sup>th</sup> September (5:00 PM – 8:00 PM)
3	Classroom Prog, DLP course, Online live course, Online Test series	General Organic Chemistry, Carbocation and Free radical	14 <sup>th</sup> September (5:00 PM – 8:00 PM)
4	Classroom Prog, DLP course, Online live course, Online Test series	Solid State, Chemical Equilibrium and Ionic Equilibrium	19 <sup>th</sup> September (5:00 PM – 8:00 PM)
5	Classroom Prog, DLP course, Online live course, Online Test series	d-Block, Coordination Chemistry, Chemical Bonding	24 <sup>th</sup> September (5:00 PM – 8:00 PM)
6	Classroom Prog, DLP course, Online live course, Online Test series	Stereochemistry and Reaction Mechanism	29 <sup>th</sup> September (5:00 PM – 8:00 PM)
7	Classroom Prog, DLP course, Online live course, Online Test series	Main Group Elements, s-Block, Dipole Moment, Weak Forces and Titration, Conductance	04 <sup>th</sup> October (5:00 PM – 8:00 PM)
8	Classroom Prog, DLP course, Online live course, Online Test series	Chemical Kinetics, Photochemistry and Nuclear Chemistry	09 <sup>th</sup> October (5:00 PM – 8:00 PM)
9	Classroom Prog, DLP course, Online live course, Online Test series	Solutions, Gaseous State, Atomic Structure and Quantum Chemistry	14 <sup>th</sup> October (5:00 PM – 8:00 PM)
10	Classroom Prog, DLP course, Online live course, Online Test series	Enolate Chemistry, Name Reaction and Reagents	19 <sup>th</sup> October (5:00 PM – 8:00 PM)
11	Classroom Prog, DLP course, Online live course, Online Test series	Redox Reaction, Thermochemistry, NMR spectroscopy, IR Spectroscopy, UV spectroscopy	24 <sup>th</sup> October (5:00 PM – 8:00 PM)
12	Classroom Prog, DLP course, Online live course, Online Test series	Bioinorganic, Physical Spectra and Thermodynamics	29 <sup>th</sup> October (5:00 PM – 8:00 PM)

13	Classroom Prog, DLP course, Online live course, Online Test series	Carbene, Nitrene, Benzyne, Biomolecules and Heterocyclic Compound	04 <sup>th</sup> November (5:00 PM – 8:00 PM)
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### MAJOR TESTS SCHEDULE

**Major Test 1                      Time: 2:00 PM to 5:00 PM                      Date: 11<sup>th</sup> Dec. 2019**

Physical Chemistry	Atomic Structure, Quantum Chemistry, Physical Spectroscopy, Basic Mathematical concept
Inorganic Chemistry	Main Group Elements
Organic Chemistry	GOC – Electronic Effect + Aromaticity + Steric Effects (SIR/SIP/NBEPR) Reaction Intermediates (Carbocation and Free Radical)

**Major Test 2                      Time: 2:00 PM to 5:00 PM                      Date: 17<sup>th</sup> Dec. 2019**

Physical Chemistry	Theory of gases, Thermodynamics, Thermochemistry
Inorganic Chemistry	d-Block, Coordination Chemistry, Organometallics
Organic Chemistry	Stereochemistry, Reaction Mechanism (SN/E)

**Major Test 3                      Time: 2:00 PM to 5:00 PM                      Date: 21<sup>st</sup> Dec. 2019**

Physical Chemistry	Chemical Equilibria, Ionic Equilibria, Phase Equilibria, Colligative Properties
Inorganic Chemistry	Periodic Properties, Chemical Bonding
Organic Chemistry	Intermediates (Carbene + Nitrene + Benzyne + Carbanion) Reagents, Name Reaction

**Major Test 4                      Time: 2:00 PM to 5:00 PM                      Date: 25<sup>th</sup> Dec. 2019**

Physical Chemistry	Electrochemistry, Conductance, Solid State, Redox Reaction
Inorganic Chemistry	Bioinorganic chemistry, Instrumental Method of analysis, Titrations
Organic Chemistry	Pericyclic Reactions, Structural Problems using Chemical Reactions, Organic Spectroscopy

**Major Test 5                      Time: 2:00 PM to 5:00 PM                      Date: 29<sup>th</sup> Dec. 2019**

Physical Chemistry	Chemical Kinetics, Adsorption, Photochemistry, Radioactivity
Inorganic Chemistry	Analytical Chemistry, Qualitative Analysis
Organic Chemistry	Natural Product Chemistry, Heterocyclic Chemistry

## PART TESTS SCHEDULE

**Part Test 1**                      **Time: 2:00 PM to 5:00 PM**                      **Date: 02<sup>nd</sup> Jan. 2019**

Physical Chemistry	Basic Mathematical Concepts, Atomic Structure, Quantum Chemistry, Theory of gases, Solid State, Colligative Properties
Inorganic Chemistry	Periodic Properties, Chemical Bonding, Main Group Elements
Organic Chemistry	GOC, Stereochemistry, Reaction Intermediates (Carbocation & Free Radicals), Reaction Mechanism

**Part Test 2**                      **Time: 2:00 PM to 5:00 PM**                      **Date: 06<sup>th</sup> Jan. 2020**

Physical Chemistry	Thermodynamics, Thermochemistry, Equilibrium, Chemical Equilibrium, Ionic Equilibrium, Phase Equilibrium
Inorganic Chemistry	d-Block, Coordination Chemistry, Organometallics, Bioinorganic
Organic Chemistry	Intermediates (Carbanion + Carbene + Nitrene + Benzyne) Reagents, Name Reaction

**Part Test 3**                      **Time: 2:00 PM to 5:00 PM**                      **Date: 10<sup>th</sup> Jan 2020**

Physical Chemistry	Electrochemistry, Chemical Kinetics, Adsorption, Physical Spectra, Redox Reaction
Inorganic Chemistry	Instrumental Method of Analysis, Analytical Chemistry, Titration, Radioactivity
Organic Chemistry	Organic Spectroscopy, Natural Products Chemistry, Heterocyclic Compounds, Pericyclic Reactions

## FULL TESTS SCHEDULE

**Full Test 1                      Time: 2:00 PM to 5:00 PM                      Date: 15<sup>th</sup> Jan. 2020**

Physical Chemistry	Complete Syllabus for JAM
Inorganic Chemistry	Complete Syllabus for JAM
Organic Chemistry	Complete Syllabus for JAM

**Full Test 2                      Time: 2:00 PM to 5:00 PM                      Date: 20<sup>th</sup> Jan. 2020**

Physical Chemistry	Complete Syllabus for JAM
Inorganic Chemistry	Complete Syllabus for JAM
Organic Chemistry	Complete Syllabus for JAM

**Full Test 3                      Time: 2:00 PM to 5:00 PM    Date: 25<sup>th</sup>Jan. 2020**

Physical Chemistry	Complete Syllabus for JAM
Inorganic Chemistry	Complete Syllabus for JAM
Organic Chemistry	Complete Syllabus for JAM

**Full Test 4    Time: 2:00 PM to 5:00 PM    Date: 30<sup>th</sup>Jan. 2020**

Physical Chemistry	Complete Syllabus for JAM
Inorganic Chemistry	Complete Syllabus for JAM
Organic Chemistry	Complete Syllabus for JAM

**Full Test 5                      Time: 2:00 PM to 5:00 PM    Date: 04<sup>th</sup> Feb. 2020**

Physical Chemistry	Complete Syllabus for JAM
Inorganic Chemistry	Complete Syllabus for JAM
Organic Chemistry	Complete Syllabus for JAM

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