CHEM ACADEMY

ALL INDIA ONLINE TEST SERIES
IIT JAM CHEMISTRY 2021
STARTING – Feb. 2020

55 TESTS: 29Unitwise 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 2021 . Our experts provide steps by step guidance to aspirants for understanding the concepts of chemistry and preparing them for scoring good marks.

Approach &Strategy: Our Simple, practical and focussed approach will help aspirants to 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:55 TESTS: 29Unitwise + 13 Minor + 5 Major + 3 Part + 5 Full Length

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

NatureFlexible- 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)
- 55 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 29: 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 30 to 42 & 43 to 47: 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 48 to 50 AND 51 TO 55: These are Full Length Test (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

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
1	Basic Mathematical Concepts	Functions; maxima and minima integrals; ordinary differential equations, vectors and matrices, determinants, Elementary statistics and probability theory	11^{th},12^{th} NCERT	RD Sharma
2	Atomic Structure & Quantum	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^{th} 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^{th} , 12^{th} 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^{th} 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/*n*-propane/*n*-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^{th} 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	12^{th} NCERT Class notes Chem Academy (DLP Kit)	K.L Kapoor, Puri-Sharma-Pathania,R.CMukherjii, Martin siberberg

		chemical potential to derive relations between the four colligative 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^{th} 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^{th} 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^{th} 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^{th} 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^{th} NCERT class notes, Chem Academy JAM (DLP Kit)	Shriver Atkins, Cathrine E Housecraft, MiesslerTarr, Hueey kieter
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 Zwiefel, Ernest Eliel
14	Main group elements	General concepts on group relationships and gradation in properties; structure of electron deficient compounds involving	11^{th}, 12^{th} NCERT, Classnotes, Chem academy JAM	Hueey, Shriver Atkins, GreenWood, Cotton &

		main group elements	(DLP Kit)	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 equilibriumconstants *Kp, Kc* and *Kx.* Le Chatelier principle (quantitative treatment); equilibrium between ideal gases &a pure condensed phase.	11^{th} 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, LiAlH4, NaBH4, 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 bruice, Carey Sandberg, Carruthers Jonathan clayden, George Zweifel
17	D Block elements	Characteristics of 3d elements; oxide, hydroxide and salts of first row metals	12^{th} NCERT, Chem academy JAM (DLP Kit)	Ajay kumar, MiesslerTarr, GreenWood, Cotton & Wilkinson, shriver Atkins
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	11^{th} NCERT Class notes, Chem academy JAM (DLP Kit)	K.L Kapoor, Puri-Sharma-Pathania, Charles Mortimer,R.C Mukherji

		hydrolysis and pH for different salts. Buffer solutions;derivation of Henderson equation and its applications; buffer capacity, buffer range, buffer actionand 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		
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 solidvapour equilibria, phase diagram for one component systems, with applications.Phase diagrams for systems of solid-liquid equilibria 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.	Class notes, Chem academy JAM (DLP Kit)	Castellen, Charles Mortimer, Peter Atkins, K L Kapoor
21	Name reactions and	Hofmann-Curtius-Lossen rearrangement, Wolff	12^{th} NCERT, Class notes,	George Zweifel, Ernest Eliel,

	rearrangements	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-Villegerreaction etc.	Chem academy JAM (DLP Kit)	Carey Sandberg,Paula bruice Jonathan clayden,ILFinar
22	Titrations	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 th 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, paulabruice, C. Sandberg, Jerry March, George Zweifel
25	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	12^{th}NCERT , Class notes, Chem academy JAM (DLP Kit)	HueeyKieter, shriverandatkins, MiesslerTarr, Catherine E.Housecraft, G.Lawrence.
26	Conductance	Conductance and its applications; transport number, Debey-Huckel-Onsagar theory of strong electrolytes.	12^{th} 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^{2+}, Fe^{3+}, Cu^{2+} and Zn^{2+}; 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^{th} 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 ^{1}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.
31	Instrumental Method of Analysis	Basic principles; 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^{th} 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	Class notes & Chem academy (DLP Kit)	Hueey,Atkins, Greenwood, Housecraft, J. Hartwig,

		and metallocenes; homogenous catalysis.		Crabtree, Elias, Asim K Das

ALL INDIA ONLINE TEST SERIES (AIOTS)

All India Online Test Series at Chem Academy starts from 15th February and resume till 1st week of February of next year. 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

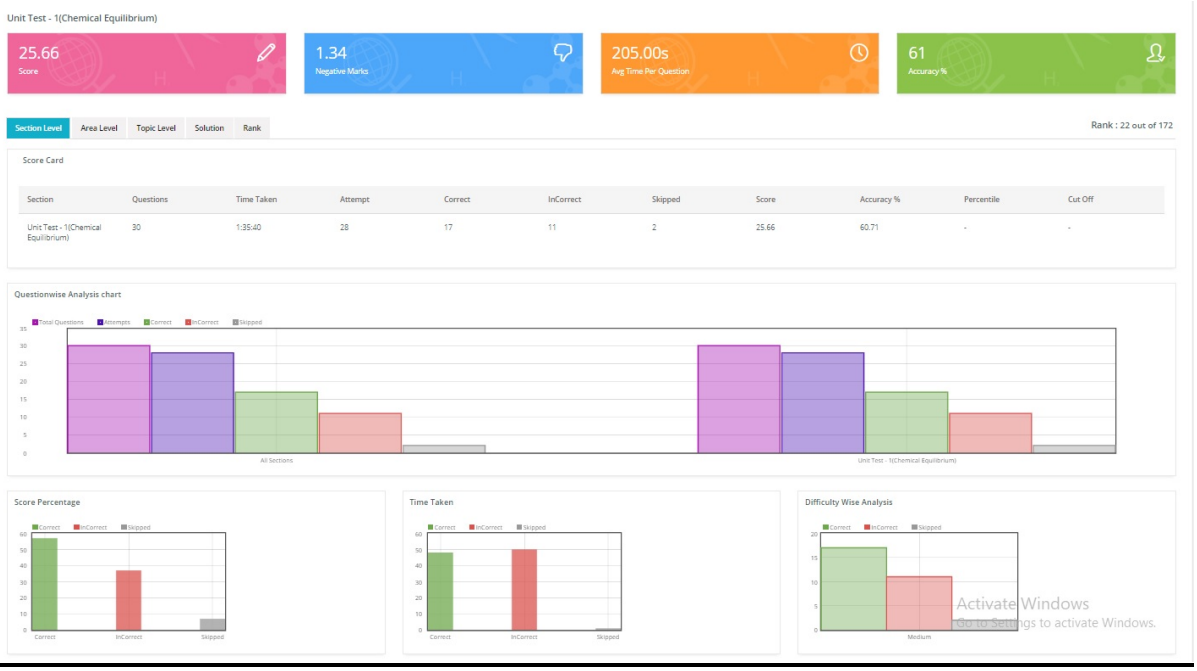
1. No. of attempted questions.
2. Correct answer question
3. Incorrect answer question
4. Time taken
5. Average time per question
6. Accuracy
7. Negative Marks
8. All India Rank (AIR)

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
55	1 Year	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 %
Percentile
Cut Off
Unit Test - 1(Chemical Equilibrium)
30
1:35:40
28
17
11
2
25.66
60.71
-
-
Questionwise Analysis chart
Total Questions
Attempts
Correct
InCorrect
Skipped
All Sections
Unit Test - 1(Chemical Equilibrium)
Score Percentage
Correct
InCorrect
Skipped
Time Taken
Difficulty Wise Analysis
Medium
Activate Windows
Go to Settings to activate Windows.

UNITWISE TOPICS TEST SCHEDULE

Test No.	Unit	Topic Covered	Uploading Date
1 (Part - 1)	Electrochemistry	Galvanic cells; EMF and free energy, concentration cells with and without transport; polarography; concentration cells with and without transport.	15 Feb. 2020
1 (Part - 2)	Conductance	Conductance and its applications; transport number, Debey-Huckel-Onsagar theory of strong electrolytes.	15 Feb. 2020
2	Stereochemistry	Optical isomerism in compounds with and without any stereocenters (allenes, biphenyls); conformation of acyclic systems (substituted ethane/*n*-propane/*n*-butane) and cyclic systems (mono- and di-substituted cyclohexanes).	21 Feb. 2020
3 (Part - 1)	Thermodynamics	Reversible and irreversible processes; first law and its application to ideal and nonideal gases; second law; entropy and free energy; criteria for spontaneity	27 Feb. 2020
3 (Part - 2)	Thermochemistry	Thermochemistry	27 Feb. 2020
4	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.	4 March 2020
5	Basic organic chemistry/GOC and Acid Base	Electronic effects (resonance, inductive, hyperconjugation, Aromaticity) and steric effects and its applications (acid/base property).	11 March 2020
6	Chemical bonding	Different types of bonding theories VSEPR,VBT and MOT, shapes of molecules, hybridization, dipole moment	17 March 2020
7	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 equilibriumconstants *Kp, Kc* and *Kx.* Le Chatelier principle (quantitative treatment); equilibrium between ideal gases &a pure condensed phase.	23 March 2020
8	Periodic properties of	Periodic classification of elements and periodicity in properties; general methods of	29 March 2020

	elements	isolation and purification of elements	
9 (Part - 1)	Chemical kinetics	Reactions of various order; Arrhenius equation; collision theory; transition state theory; chain reactions - normal and branched; enzyme kinetics	4 April 2020
9 (Part - 2)	Photochemistry	Photochemical processes, Quantum yield	4 April 2020
10 (Part - 1)	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	10 April 2020
10 (Part - 2)	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 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.	10 April 2020
11	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-Villegerreaction etc.	16 April 2020
12 (Part - 1)	Aromatic and Hetrocyclic chemistry	Monocyclic, bicyclic and tricyclic aromatic hydrocarbons, and monocyclic compounds with one hetero atom: synthesis, reactivity and properties.	22 April 2020
12 (Part - 2)	Natural Products Chemistry	Chemistry of alkaloids, steroids, terpenes, carbohydrates, amino acids, peptides and nucleic acids	22 April 2020
13 (Part - 1)	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	28 April 2020
13 (Part - 2)	D Block elements	Characteristics of 3d elements; oxide, hydroxide and salts of first row metals	28 April 2020
14	Reaction Intermediates	Chemistry of reactive intermediates (carbocations, carbanions, free radicals, carbenes, nitrenes, benzynes etc ...)	04 May 2020
15	Reaction mechanism	Nucleophilic and electrophilic substitution (SN1,SN2, SNi, E1,E2,E1cb, anchimeric	10 May 2020

		assistance)	
16	Aromatic Electrophilic and Nucleophilic substitution Addition elimination reactions	Nitration,sulphonation,halogenations Di and tri electrophilic substitution in benzene rings and fused polycyclic rings systems	16 May 2020
17	Reagents	Oxidation and reduction reactions (Clemmensen, Wolff-Kishner, LiAlH4, NaBH4, MPV, PDC and PGC etc) in organic chemistry, organometallic reagents in organic synthesis (Grignard, organolithium and organocopper).	22 May 2020
18 (Part - 1)	Radioactivity	nuclear theories, nuclear reactions, applications of isotopes	28 May 2020
18 (Part - 2)	Adsorption	Gibbs adsorption equation; adsorption isotherm; types of adsorption; surface area of adsorbents; surface films on liquids	28 May 2020
18 (Part - 3)	Redox Titrations	Acid-base, oxidation-reduction and complexometric titrations using EDTA; precipitation reactions, Redox reactions	28 May 2020
19	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 actionand 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	03 June 2020
20	Bio inorganic	Essentials and trace elements of life; basic reactions in the biological systems and the role of metal ions, especially Fe^{2+}, Fe^{3+}, Cu^{2+} and Zn^{2+}; structure and function of hemoglobin and myoglobin and carbonic anhydrase	09 June 2020
21	Organometallic	Organometallic compounds having ligands with back bonding capabilities such as metal carbonyls, carbenes, nitrosyls and	15 June 2020

		metallocenes; homogenous catalysis.	
22	Atomic Structure & Quantum	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	21 June 2020
23 (Part - 1)	Qualitative Organic Analysis	Identification of functional groups by chemical tests	27 June 2020
23 (Part - 2)	Organic Spectroscopy	elementary UV, IR and ^{1}H NMR spectroscopic techniques as tools for structural elucidation	27 June 2020
24	Pericyclic Reactions	Diels-Alder, electrocyclic and sigmatropic reactions	03 July 2020
25	Main group elements	General concepts on group relationships and gradation in properties; structure of electron deficient compounds involving main group elements	09 July 2020
26	Physical Spectra	Beer-Lambert law; fundamental concepts of rotational, vibrational, electronic and magnetic resonance spectroscopy	15 July 2020
27	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 solidvapour 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 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 July 2020
28	Instrumental Method of Analysis Analytical chemistry	Basic principles; instrumentations and simple applications of conductometry, potentiometry and UV-vis spectrophotometry; analysis of water, air and soil samples. Principles of qualitative and quantitative analysis	27 July 2020
29	Basic Mathematical Concepts	Functions; maxima and minima, integrals; ordinary differential equations; vectors and matrices, determinants, Elementary statistics and probability theory	02 August 2020

MINOR TEST SCHEDULE

No of tests	Batch	Topic	Test Date (online)
1	Classroom Prog, DLP course, Online live course, Online Test series	Electrochemistry, Conductance, Stereochemistry	24th August 2020
2	Classroom Prog, DLP course, Online live course, Online Test series	Thermodynamics, Thermochemistry, Solid State	30th August 2020
3	Classroom Prog, DLP course, Online live course, Online Test series	Basic Organic Chemistry / GOC + Acid Base	05th September 2020
4	Classroom Prog, DLP course, Online live course, Online Test series	Chemical Equilibrium, Chemical Bonding	11th September 2020
5	Classroom Prog, DLP course, Online live course, Online Test series	Theory of Gases, Colligative Properties, Chemical Kinetics	17th September 2020
6	Classroom Prog, DLP course, Online live course, Online Test series	Aromatic and Hetrocyclic Chemistry; Natural Products; Name Reaction and Rearrangements	23rd September 2020
7	Classroom Prog, DLP course, Online live course, Online Test series	Coordination Complexes; D block; Reaction Mechanism	29th September 2020
8	Classroom Prog, DLP course, Online live course, Online Test series	Reagents; Reaction Intermediate	05th October 2020
9	Classroom Prog, DLP course, Online live course, Online Test series	Radioactivity; Adsorption; Redox Titration	11th October 2020
10	Classroom Prog, DLP course, Online live course, Online Test series	Organometallics; Bioinorganic; Ionic Equilibrium	17th October 2020
11	Classroom Prog, DLP course, Online live course, Online Test series	Qualitative Organic Analysis; Organic Spectroscopy; Atomic Structure & Quantum	23rd October 2020
12	Classroom Prog, DLP course, Online live course, Online Test series	Main Group Elements; Physical Spectroscopy; Pericyclic Reaction	29th October 2020

13	Classroom Prog, DLP course, Online live course, Online Test series	Basic Mathematical Concepts; Instrumental Method of Analysis, Analytical Chemistry; Phase Equilibrium	04th November 2020

MAJOR TESTS SCHEDULE

Major Test 1 **Date: 19th Dec. 2020**

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 **Date: 23rd Dec. 2020**

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

Major Test 3 **Date: 27th Dec. 2020**

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 **Date: 31st Dec. 2020**

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 **Date: 04th Jan. 2021**

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 **Date: 08th Jan. 2021**

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 **Date: 12th Jan. 2021**

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 **Date: 16th Jan 2021**

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 **Date: 20th Jan. 2021**

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

Full Test 2 **Date: 24th Jan. 2021**

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

Full Test 3 **Date: 28th Jan. 2021**

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

Full Test 4 **Date: 01st Feb. 2021**

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

Full Test 5 **Date: 05th Feb. 2021**

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