कलाम ACADEMY

असिस्टेंट प्रोफेसर

टास्क आधारित

टेस्ट सीरीज

ऑनलाइन व ऑफलाइन

रसायन विज्ञान

MINOR TEST	MAJOR TEST	FINAL TEST
12	03	03

कलाम ACADEMY

सीकर सेन्टर : नवलगढ रोड़, सीकर (राज.) मो. : 72400-12121
रिद्धि–सिद्धि चौराहा, गोपालपुरा बाईपास,
जयपुर सेन्टर : जयपुर (राज.) मो. : 99828-44044

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ऑफलाइन परीक्षा केन्द्र

जयपुर	जोधपुर	भीलवाड़ा	नागौर	अलवर
सीकर	कोटा	अजमेर	डीडवाना	कोटपूतली–बहरोड़
नीमकाथाना	बीकानेर	दौसा	कुचामन सिटी	भरतपुर
बाड़मेर	गंगापुर सिटी	उदयपुर	चूरू	हनुमानगढ
सूरतगढ	पाली	बांसवाड़ा	झुंझुनूं	नोहर (हनुमागढ)

- उपर्युक्त 25 शहरों में ऑफलाइन टेस्ट सीरीज का आयोजन किया जाएगा।
- यदि किसी कारण आवेदन करने के पश्चात आपके शहर में ऑफलाइन टेस्ट सीरीज का आयोजन नहीं किया जाता है तो इस स्थिति में सम्पूर्ण फीस वापिस लौटा दी जाएगी और ऑनलाइन टेस्ट सीरीज नि:शुल्क उपलब्ध करवायी जाएगी परन्तु यदि आप वैकल्पिक रूप से अन्य सेन्टर का चयन करना चाहते है तो उसके लिए सेन्टर चयन का विकल्प प्रदान किया जायेगा।

टेस्ट सीरीज की प्रमुख विशेषताएँ

- ऑफलाइन अभ्यर्थियों को कलाम टास्क बुकलेट व समसामयिकी का वितरण किया जायेगा।
- ऑनलाइन अभ्यर्थियों के लिए कलाम टास्क बुकलेट व समसामयिकी केवल **Read Only Mode** में उपलब्ध होगी।
- प्रश्न-पत्र का माध्यम हिन्दी व अंग्रेजी दोनों होगा, परन्तु कलाम टास्क बुकलेट व समसामयिकी केवल हिन्दी माध्यम में ही उपलब्ध होगी।

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प्रथम व द्वितीय प्रश्न-पत्र- रसायन विज्ञान

टास्क आधारित टेस्ट सीरीज

TEST	DATE	REMARK
Minor Test-01	27.07.2025	
Minor Test-02	03.08.2025	
Minor Test-03	10.08.2025	
Minor Test-04	18.08.2025	
Major Test-01	24.08.2025	
Minor Test-05	01.09.2025	
Minor Test-06	07.09.2025	
Minor Test-07	14.09.2025	
Minor Test-08	21.09.2025	
Major Test-02	28.09.2025	
Minor Test-09	05.10.2025	
Minor Test-10	11.10.2025	
Minor Test-11	17.10.2025	
Minor Test-12	26.10.2025	
Major Test-03	02.11.2025	
Final Test-01	09.11.2025	Paper-1 + Paper-3
Final Test-02	16.11.2025	Paper-2 + Paper-3
Final Test-03 (Sub.)	22.11.2025	Paper-1 + Paper-2
Final Test-03 (G.K.)	23.11.2025	Paper-3

नोटः- विशेष परिस्थिति में परीक्षा के दिन एवं दिनांक में परिवर्तन किया जा सकता है।

Test Date	Syllabus
Minor Test 01 **27.07.2025**	**Inorganic Chemistry** **Chemical Periodicity:** Periodic Table, Electronic Configuration of Various Group Elements. Periodicity in properties of s, p, d and f-block elements and their trends. **Chemical Bonding:** Concept of hybridization VBT, LCAO, MOT of homo and heteronuclear diatomic and polyatomic molecules, Coulson diagrams, Valance Shell Election Pair Repulsion Theory, Hydrogen bonding, Fajans Rule and Polairty in Covalent Compounds. **Acid-bases and Non-aqueous Solvents:** Basic theories, HSAB concept. Non aqueous solvents: DMSO, THF and Liquid NH_3 their reactions and solvent action.
Minor Test 02 **03.08.2025**	**Inorganic Chemistry** **Chemistry of Non-Transition and Inner Transition Elements:** (i) Preparation, properties and bonding in diborane and higher boranes, polyhedral borane anions and carboranes, borazines, borane nitrile. Silicones and silicates, phosphonitrilic compounds, interhalogen Xenon compounds. (ii) Lanthanides and actinides Contraction, oxidation states, super heavy elements, analytical and Medicinal applications. **Transition Metal Chemistry:** Properties with special reference to variable oxidation state, magnetic, colour and complexation behaviour. Metal to Ligand and Ligand to Metal charge transfer spectra, Metal atom clusters, Nomenclature and Isomerism in co-ordination compounds, Ligand field theory, high spin and low spin complexes, CFT, CFSE and Jahn-Teller effect. **Organometallic Compounds:** Synthesis, structure, bonding, reactions and reactivity, Applications in homogeneous catalysis. Cage and Cluster Compounds.

Test Date	Syllabus
Minor Test 03 10.08.2025	**Inorganic Chemistry** **Bioinorganic and Supra Molecular Chemistry:** Iron storage and transport, oxygen carriers and transport, electron transfer reactions, Metalloenzymes; Zinc Iron and Copper enzymes, Vitamin B_{12} Coenzyme. Metal defincency and disease. Supra molecular reactions and Catalysis, supra moleculer devices. **Group Theory:** Symmetry elements and operations, point groups, mullkin symbol, GMT and charactic Table, Great Orthogonality Theorem and application hybridization and vibrational Spectroscopy. Concepts of inorganic ESR, Mass and IR Spectroscopy.
Minor Test 04 18.08.2025	**Organic Chemistry** **Nomenclature of Organic Compounds:** Common and IUPAC nomenclature of Aliphatic, Aromatic, Hetroaromatic, Bicyclo Compounds and Spiranes. **Isomerism:** Structural Isomerism, Stereoisomerism both geometrical and optical with E/Z and R/S systems respectively. Conformational analysis of alkanes and cyclo alkanes, Asymmetric Synthesis Stereoselective and Stereospecific reactions. **Basic principles of Organic Chemistry and Reaction Mechanism:** Inductive, Electromeric, Mesomeric, Hyperconjugative and Resonance effects. Reactive Intermediate species i.e. carbocation (classical and non classical), Carbanion, Carbene, free Radicals, Nitrene and Benzyne. Types of reagents- electrophiles and nucleophiles. Basic reaction mechanismAddition, Substitution, Elimination and Rearrangements. **Major Test-01 (24.08.2025)** **Minor-01 + Minor-02 + Minor-03 + Minor-04**

Test Date	Syllabus
Minor Test 05 01.09.2025	**Organic Chemistry** **Name Reactions and Mechanisms:** Aldol, Benzoin, Cannizzaro's, Perkin's, Stobbe, Dieckmann Condensations. Pinacole-Pinacolone, Wagner-Meerwin, Hoffmann, Schmidt, Lossen, Curtius, Beckmann, Fries, Baeyer-Villiger, Wittig, Reformatsky Rearrangements. **Aromatics Heteroaromatics, annulenes and heteroannulenes:** Basics of Aromaticity and antiaromaticity. Synthesis and reactions of anthracene, phenenthrene, biphenyl, furan, thiophene, pyrrole, pyridine, quinoline, isoquinoline and indole. UV, IR, NMR and mass spectroscopy of organic compounds. **Organic Photochemistry:** Jablonski diagram, photochemistry of alkenes, carbonyl compounds and aromatic compounds, photodegradation of polymers, singlet molecular oxygen reactions. Paterno-Buchi reaction, Norrish Type I and II reactions and Barton reaction.
Minor Test 06 07.09.2025	**Organic Chemistry** **Organic Transformation and Reagents:** Functional group interconversions, oxidative and reductive processes. Common catalyst and reagents (organic, inorganic organometallic and enzymatic like $LiAlH_4$, $NaBH_4$, iodobenzene diacetate, thallium (III) nitrate RuO_4, OsO_4, CH_3Li, $(CH_3)_2Hg$, $(CH_3)_2Zn$ etc. **Synthetic Application of Organometallics and Reactive Methylene Compounds:** Grignard reagent, Organo lithium compounds, Aceto acetic ester and Malonic ester. Their Synthesis, identification, estimation and important applications in the Synthesis of organic compounds.

Test Date	Syllabus
Minor Test 07 **14.09.2025**	**Organic Chemistry** **Pericyclic Reactions:** Molecular orbital symmetry, Frontier orbitals of ethylene, buta-1,3-diene, hexa1,3,5-triene. Classification of pericyclic reactions. Woodward Hoffmann correlation diagrams. electrocyclic and cycloaddition reactions and sigmatropic rearrangements, eg. Cope, Claisen, Aza-Cope, Sommlet-Hauser rearrangements. **Natural Products and Medicinal Chemistry:** Classification and structure of Carbohydrates, proteins, nucleic acids and fatty acids. Classification, Nomenclature and isolation techniques of Terpenoids, Carotenoids, Alkaloids and terpenes. Drug design and introduction to pharmacodynamics, Some Cardio Vascular Psychotic and Antipsychotic drugs.
Minor Test 08 **21.09.2025**	**Physical Chemistry** **Solid State:** Types of solids, Bravis lattices, determination of unit cell parameters, defects in solidsFrenkel, Schottky, Point, Line and Plane defects. 3 Structural classification of binary and ternary compounds, diffraction techniques, bonding, thermal, electrical and magnetic properties. Insulators, Semiconductors and Super conductors. **Solution and Colligative Properties:** Types of Solutions Concentration measurement methods. Normality, Molarity, Molality etc. Raoults law (deviation from ideal behaviour),Nernst law, Henery law, Relative lowering of Vapour Pressure, Elevation in Boiling Point, Depression in Freezing Point, Osmosis and Osmotic Pressure. **Colloids and Surface Chemistry:** Absorption and Adsorption, Adsorption isotherms and surface area analysis, Types and properties of colloids, Micelles, Micelle action and Critical Micelle Concentration. Applications of colloids.

Major Test-02 (28.09.2025)

Minor-05 + Minor-06 + Minor-07 + Minor-08

Test Date	Syllabus
Minor Test 09 05.10.2025	**Physical Chemistry** **Chemical kinetics:** Ionic Reactions, Kinetic salt effect, Steady State Kinetics, Kinetic and Thermodyanic Control of reactions, Dynamic chain, photochemical reaction, acid base and enzyme catalysis, fast reaction: study by stop flow method. **Electrochemistry:** Electrochemistry and Ionic Equilibrium, Theory of strong and weak electrolytes pH Buffer and Buffer action, Electrolysis and electrolytic Cell, Electrochemical cells and reactions, Nernst equation, emf measurement, Calculation of Gibbs free energy and equilibrium constants. Primary and Secondary cells, fuel cell, corrosion and its prevention. **Physical Chemistry of Polymers:** Molecular weight determination of polymers: Number average and Weight average molecular weights, End-group analysis, Sedimentation, Light scattering and Viscosity methods. Stereochemistry and mechanism of polymerization. Crystallisation and melting in polymers. Relation between Tm and Tg.
Minor Test 10 11.10.2025	**Physical Chemistry** **Nuclear and Radio Chemistry:** Nuclear Models, Radioactive decay, mass defect, binding energy, fission and fusion, Isotopes, Isobars, Isodiaphers and application of Isotopes in medicinal Science. **Thermodynamics:** First law: relation between Cp and Cv, enthalpies of physical and chemical changes, temperature dependence of enthalpies, Joules Law, Joules Thomson coefficient, Second law: entropy, Criteria of Spontaneity Gibbs and Helmholtz functions, evaluation of entropy and Gibbs function, GibbsHelmholtz equation, Maxwell relations. Thermodynamics of ideal and non-ideal gases and solutions. Third Law of Thermodynamics.

Test Date	Syllabus
Minor Test 11 17.10.2025	**Physical Chemistry** **Quantum Chemistry:** Basic principles and application of quantum mechanics. Schrodinger equation, hydrogen atom, hydrogen molecule ion and angular momentum. Variational and Perturbational method, term symbols and spectrascopic status. Atomic structure and its theoretical treatment. **Statistical Thermodynamics and Phase equilibria:** Boltzmann distribution law, kinetic theory of gases, partition function: vibrational, rotational, translational and electronic properties and applications of partition functions and the relation with thermodynamic quantities. Basic principles of phase equilibria.
Minor Test 12 26.10.2025	**Interdisciplinary** **Environmental Chemistry:** Air Pollution- Pollution due to SOX, NOX, Ozone Depletion and Green House Effect, photochemical smog, reaction of hydroxyl radical with CH4, SOX and NOX. Water Pollution: International Standards of drinking water, water quality parameters COD, BOD, TDS, pH etc., Treatment of potable and sewage waste water. Soil- Types of soil, soil profile and analysis of physical and chemical parameters. **Statistical Data Analysis and Analytical Technique:** Mean, Mode, Median, Standard Deviation, Regression analysis and Correlation principles and applications of AAS, DTA, TGA. Partition and adsorption chromatography. **Green Chemistry and Nano Chemistry:** Principles of Green Chemistry and Sustainable Development, Green Reagents and Green Synthesis. Introduction to Nano particles, Nano Science and Nano Technology. Optical and Magnetic properties of Nano material. Characterization of Nano materials by TEM, SEM, SPMT, AFM, X-Ray Diffraction and ASCA.

Major Test-03 (02.11.2025)
Minor-09 + Minor-10 + Minor-11 + Minor-12

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टास्क आधारित टेस्ट सीरीज

01
FINAL TEST

09.11.2025

02
FINAL TEST

16.11.2025

03
FINAL TEST

22.11.2025

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जयपुर सेन्टर : जयपुर (राज.) मो. : 99828-44044