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Sr. No.	Test Name	Test Date	Test Syllabus
1	FT-01	08-May-20	**Physics : Physical World, Units & Measurements** Chemistry : Some Basic Concepts of Chemistry-I: Nature of Matter, Properties of matter and their measurement SI unit, Mass weight, Volume temperature, Need for standard reference, Scientific notation, Precision and accuracy : (i) Significant figure and calculation involving significant figure., Law of chemical combination : (i) Law of conservation of mass, (ii) Law of constant combination, (iii) Law of multiple proportion, (v) Gay-Lussac's law, (vi) Avagdro law, (vii) Dalton's atomic theory Atomic mass : (i) Relative atomic mass, (ii) Average atomic mass, (iii) Molecular mass calculation using atomic mass. Mole concept : (i) Calculation based on mole concept : (i) Molar mass and concept of gram atom, gram molecule, Formula representation of molecule : (i) Empirical formula, (ii) Molecular formula, (iii) Formula unit, (ii) Concentration term : (i) Molarity, (ii) Molality, (iii) Mole fraction. **Mathematics : Basics of Mathematics, Sets:, Wavy curve method and Inequalities**
2	FT-02	22-May-20	**Physics : Motion in a Straight Line-I** Concept of position, path length, displacement, average velocity & average speed, Instantaneous velocity and speed., Differentiation, Its physical significance, Important formulae for Differentiation, Application of Differentiation, Integration, Its physical significance, Important formulae, Application of Integration **Chemistry : Some Basic Concepts of Chemistry-II:** Concept of limiting reagent : Use of stoichiometry in balanced equation and limiting reagent concept, Gravimetric and volumetric analysis., Stoichiometry : (i) Problem on gravimetric and volumetric analysis, (ii) Principle of atom conservation; Equivalent mass : (i) Equivalent mass and gram equivalent, (ii) Normality, (iii) Relation between molarity and normality, (iv) n-factor, Stoichiometry - Application of gram equivalent concept and percentage of free SO_3 in oleum, **Mathematics : Relations and Functions, Transformation of Graphs -I:** Introduction, Cartesian products of sets & Relations, Definition of function., Definition of domain, Range, Methods to find out domain, Some basic functions and their graphs, Algebra of functions, Identity function constant function, polynomial function, , Rational function, Irrational functions. Modulus function and their properties ,
3	FT-03	05-Jun-20	**Physics : Motion in a Straight Line-II:** Average and Instantaneous acceleration, Kinematics of non uniformly accelerated motion, Uniformly accelerated motion, Motion Under Gravity, Graphs between position, velocity, acceleration and time for uniform and nonuniform accelerated motion., Relative velocity in one Dimension only **Chemistry : Structure of Atom** **Mathematics : Relations and Functions, Transformation of Graphs-II:** Signum function, Greatest integer, Fractional part function, Exponential function, logarithmic function and their properties., Algebra of real function, replacement properties of function, Transformations of Graphs, Assignment discussion.,
4	TE-01	12-Jun-20	**Syllabus of FT-01 to FT-03**

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5	FT-04	26-Jun-20	**Physics : Motion in a Plane** **Chemistry : Classification of Elements and Periodicity in Properties, Chemical Bonding and Molecular Structure-I** (i) What is chemical bond ? (ii) Types of chemical bond (Just introduction), (iii) Lewis dot structure (overview), (iv) Formal charge., (v) Ionic bonding (energetics), (vi) Properties of ionic solid, (i), Covalent bonding (valence bond theory), (ii) Type of orbital overlap (s and p bond), (iii) Orbital overlap to explain simple molecules, (iv) Hybridisation concept in introduction, (i) Overlap of hybridised orbital and orbital overlap diagram, (ii) Prediction of hybridisation state and shape of molecule. **Mathematics : Trigonometric Functions -I : Trigonomatric Ratios & Identities, Transformation formulae, Trigonometric Equation (based on NCERT only)**
6	FT-05	10-Jul-20	**Physics : Laws of Motion-I:** The law of inertia, Newton's first law of motion, Momentum, Newton's second law of motion, Impulse, Newton's third law of motion, Conservation of linear momentum., Equilibrium of a particle, Common forces in mechanics (Weight, tension, normal reaction, Spring force), Motion of connected bodies, Motion of a body on an inclined plane, Pulley block system, Problems on pulley block system (including movable pulley), **Chemistry : Chemical Bonding and Molecular Structure-I:** (iii) Fajan's rule, (iv) Percentage ionic character, (v) VSEPR theory, Bond Parameters (bond length, bond angle, bond energy), Resonance, (ii) concept of dipole moment, **Chemical Bonding and Molecular Structure-II:** (i) , (i) Linear combination of atomic orbitals (ii) Molecular orbital theory (concept of bonding and anti-bonding orbital) and shape of molecular orbitals., (i) Filling of M.O. and energy diagram, (ii) Determine bond order and discuss magnetic property / bond length and bond stability, (iii) H-bonding, (iv) Metallic bonding., **Mathematics : Principle of Mathematical Induction, Quadratic Equations**
7	FT-06	24-Jul-20	**Physics : Laws of Motion-II:** Problems involving Movable Wedge, Friction, Static & kinetic friction, Motion on a fixed rough surface, Miscellanous problems on friction (one block over the other), Inertial & non inertial frames, Pseudo force. Solving problems in non-inertial frames, Circular motion and banking of roads. **Chemistry : States of Matter** **Mathematics : Complex Numbers-I :** Cartesian Form, Algebra of Complex Numbers, Modulus & conjugate of a Complex Number, Polar form, **Linear Inequalities, Sequences and Series: (Including Exponential series logarithmic series.)**
8	TE-02	31-Jul-20	**Syllabus of FT-04 to FT-06**
9	FT-07	07-Aug-20	**Physics : Work, Energy and Power** **Chemistry : Thermodynamics** **Mathematics : Binomial Theorem:** (Including Factorial notation definition of P(n,r) and C(n,r))

Aakash PracTest

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Sr. No.	Test Name	Test Date	Test Syllabus
10	FT-08	21-Aug-20	**Physics : System of Particles and Rotational Motion-I:** Centre of mass of discrete particle system and continuous mass distribution, Motion of centre of mass, Linear momentum of system of particles, , Miscellaneous Problems on Conservation of linear momentum and mechanical energy., Rigid body, Rigid body constraint for velocity and acceleration, Vector product of two vectors, Torque, Equilibrium of a rigid body, Shifting of normal reaction and toppling, , Moment of inertia for discrete particle system, Uniform symmeteric bodies. Theorems of perpendicular and parallel axis., Dynamics of rotational motion about a fixed axis **Chemistry : Equilibrium-I:** Introduction to equilibrium : (i) Physical equilibrium, (ii) Chemical equilibrium, (iii) Law of mass action and equilibrium constant, (iv) Introduce K_c and K_p, (v) Relation between K_c and K_p, (vi) Homogeneous and hetrogeneous equilibria., Applications of equilibrium constant : (i) Predicting the extent of reaction, (ii) Predicting direction of reaction, (iii) Predicting equilibrium concentration, (iv) Solving problems based on them., (i) Relationship between equilibrium constant (K), reaction quotient (Q) and Gibb's free energy (G), (ii) Relative vapour density and degree of dissociation., (iii) Factors affecting equilibria (Lechatelier principle), (iv) Solving problems based on Chemical Equilibrium, Ionic equilibrium in solution : (i) Acids, bases and salts, (ii) Acids and bases- Arrhemius concept, Bronsted and Lowry concept and Lewis concept, (iii) Ionisation of water and K_w, pH scale, Effect of temperature on pH scale, (iv) pH of acids and bases (v) Ionisation constants of weak acids and weak bases (pH calculation)., **Mathematics : Permutations and Combinations**
11	FT-09	09-Oct-20	**Physics : System of Particles and Rotational Motion-II:** General motion of a rigid body, Kinematics of Rolling motion, Dynamics of Rolling Motion, Rotational kinetic energy and work-energy theorm for rigid body., Angular momentum of a particle and system of particles. Angular momentum of rigid body. Conservation of angular momentum. Angular Impulse. Instantaneous axis of rotation. **Chemistry : Equilibrium-II:** (i) Factors affecting acidic strength, (ii) Common ion effect in the ionisation of weak acids and weak bases, (iii) pH determinations of a (iv) Mixture of two weak acid, (i) Polyprotic weak acid, (ii) introduce the concept of salt hydrolysis, (iii) Salt of strong acid strong base, (i) Salt of weak acid strong base, (ii) Salt of weak base strong acid, (iii) Salt of weak acid weak base, (iv) Hydrolysis constant and pH determination., Buffer solution : (i) Types of buffer solution - Acidic buffer, Basic buffers and Salt buffers. (i) Buffer action, (ii) pH of a buffer solution, (iii) Buffer capacity. (iv) Acid-base titration-theory of indicators, pH curves., (v) Solubility and solubility product, (vi) Relation between solubility and solubility product., (i) Common ion effect on solubility of ionic salts, (ii) Different cases of calculating solubilities, (iii) Ionic product and solubility product (Precipitation) **Mathematics : Straight Lines:** (Including Pair of Straight Lines)
12	TE-03	23-Oct-20	**Syllabus of FT-07 to FT-09**
13	FT-10	30-Oct-20	**Physics : Gravitation:** **Chemistry : Redox Reactions, Volumetric Analysis** **Mathematics : Conic Sections-I:** (Circle)
14	FT-11	13-Nov-20	**Physics : Mechanical Properties of Solids, Mechanical Properties of Fluids** **Chemistry : Hydrogen, The s-Block Elements, The p-Block Elements** **Mathematics : Conic Sections II :** (Parabola, Ellipse and Hyperbola)

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Sr. No.	Test Name	Test Date	Test Syllabus
15	FT-12	27-Nov-20	**Physics : Thermal Properties of Matter, Thermodynamics** **Chemistry : Organic Chemistry - Some Basic Principles and Techniques-I:** General Introduction; Structural representation and classification of organic compounds; Nomendature: Rules of IUPAC nomenclature of alkanes and unsaturated hydrocarbons., IUPAC nomenclature of (i) Monofunctional and (ii) polyfunctional organic compounds, (iii) Monosubstituted benzene compounds and (iv) di, tri or higher substituted benzene compounds., Isomerism: Structural isomerism (i) Chain isomerism, (ii) Position isomerism, (iii) Functional and (iv) Metamerism, Tautomerism: Various types of tautomerism; General machanism of tautomerism; Unsaturation number, Stereoisomerism: (i) Geometrical isomerism (ii) Conformational isomerism Conformations of ethane, butane and cyclohexane; Relative stability of conformers., Concepts of organic reaction machanism: (i) Fission of a covalent bond, (ii) Types of reagents : Electrophiles, nucleophiles. **Mathematics : Complex Numbers-II:** (Including Geometrical Application)
16	TE-04	11-Dec-20	**Syllabus of FT-10 to FT-12**
17	FT-13	25-Dec-20	**Physics : Kinetic Theory of Gasses, Oscillations** **Chemistry : Organic Chemistry - Some Basic Principles and Techniques-II:** Electron displacement in covalent bonds: (i) Inductive effect (+I and –I), (ii) Electromeric effect (+E and –E), Resonance (+R and –R): Resonance energy; Application of inductive and resonance effects. Aromaticity; Hyperconjugation; Relative stability of (i) Carboncation, (ii) Free radical and (iii) Alkene, , Reaction intermediates: (i) Carbocations, (ii) Carbanions, (iii) Free radicals; Types of reactions. (i) Addition reaction, (ii) Elimination reaction, (iii) Substitution reaction and (iv) Rearrangement, Methods of purification of organic compounds (i) Sublimation, (ii) Crystallisation, (iii) Distillation, (iv) Fractional distillation, (v) Distillation under reduced pressure, (vi) Steam distillation and (vii) Chromatography, Qualitative analysis of organic compounds (i) Detection of carbon and hydrogen (ii) Lassaignes test for detection of nitrogen, Sulphur, halogens and phosphorus, Quantitative analysis: (i) Estimation of carbon and hydrogen (Liebig's method), (ii) Estimation of nitrogen by Dumas method and Kjeldahls method, (iii) Estimation of halogens, Sulphur and phosphorus by carius method, (iv) Molecular weight determination. **Mathematics : Introduction to Three Dimensional Geometry, Limits and Derivatives**

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18	FT-14	08-Jan-21	**Physics : Waves-I:** Progressive wave and its types [Transverse & longitudinal]; Wave pulse; Wave function and equation of a plane progressive harmonic wave. Phase difference, Path difference; Particle velocity, Particle acceleration, Velocity of transverse wave in string, Velocity of longitudinal waves (sound wave); Intensity and loudness, power transmitted in waves, Super Position of Waves, Reflection and refraction of waves; Standing waves and its wave function ; Standing waves in string fixed at both ends /Free at one end. Organ pipe, Resonance tube and end correction, **Chemistry : Hydrocarbons:** Introduction; Classification of hydrocarbons; Alkanes: (i) Nomenclature and Isomerism; (ii) Preparation of alkanes from unraturated hydrocarbons, alkyl halides, Carbonyl compounds and carboxylic acids., Properties of alkanes: Physical properties; Chemical properties; (i) Substitution reactions-halogenation, (ii) Combustion, (iii) Controlled oxidation, (iv) Isomerisation, (v) Aromatization and (vi) Pyrolysis, Alkenes : Structure of double bond; Isomerism : Structural and geometrial; Preparation of alkenes from alkynes, alkylhalides, vicinal dihalides and alcohols (Saytzeff and Hoffmann rule), Physical properties and chemical properties of alkenes (i) Addition of hydrogen, halogen, hydrogen halides, (ii) Markovnikov addition, (iii) Peroxide effect and (iv) Addition of sulphuric acid and water, Oxidation of alkenes by (i) Baeyer's reagent and (ii) acidified $KMnO_4$; Ozonolysis; Polymerisation. Dienes and their addition reactions with halogen and hydrogen halide, Hydrocarbons, **Mathematics : Mathematical Reasoning, Statistics, Probability**
19	FT-15	22-Jan-21	**Physics : Waves-II:** Interference of sound waves ; Condition for maxima and minima in terms of phase difference and path difference., Beats, definition of beat frequency and calculation of beat frequency, Application of beats to find unknown frequency, Doppler effect; Mixed problem on Doppler effect and beats. **Chemistry :** Alkynes : (i) Nomenclature, Isomerism, (ii) Structure of triple bond, (iii) Preparation of alkynes and (iv) physical properties and (v) Acidic character alkynes., Addition reactions of alkynes,, Addition of hydrogen, halogen, hydrogen halide, water; Polymerisation; Oxidation; Ozonolysis, Aromatic hydrocarbons: Structure of benzene; Resonance in benzene; Molecular orbital theory. Preparation of benzene. Electrophilic Aromatic substitution, General mechanism, Nitration, Halogenation and sulphonation of benzene; Friedel Craft's alkylation and acylation of benzene; Addition of H_2 and Cl_2 to benzene, Ortho, Meta and para directing groups; Activating groups; Deactivating groups, Orientation in monosubstituted benzene, **Environmental Chemistry** **Mathematics : Trigonometric Functions -II:** (Remaining Parts of Trigonometric Functions)