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PHY CHEM MATH

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JEE MAINS

playlist

www.tinyurl.com/jeewithneha

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MARKS vs PERCENTILE

	JEE 2021 FEB Shifts					
Percentile	24 M	24 E	25 M	25 E	26 M	26 E
99	220	200	190	195	215	170
98	190	170	160	170	195	150
97	170	155	140	158	175	135
96	160	145	130	140	160	125
95	145	135	115	125	150	110
90	110	100	85	100	110	90

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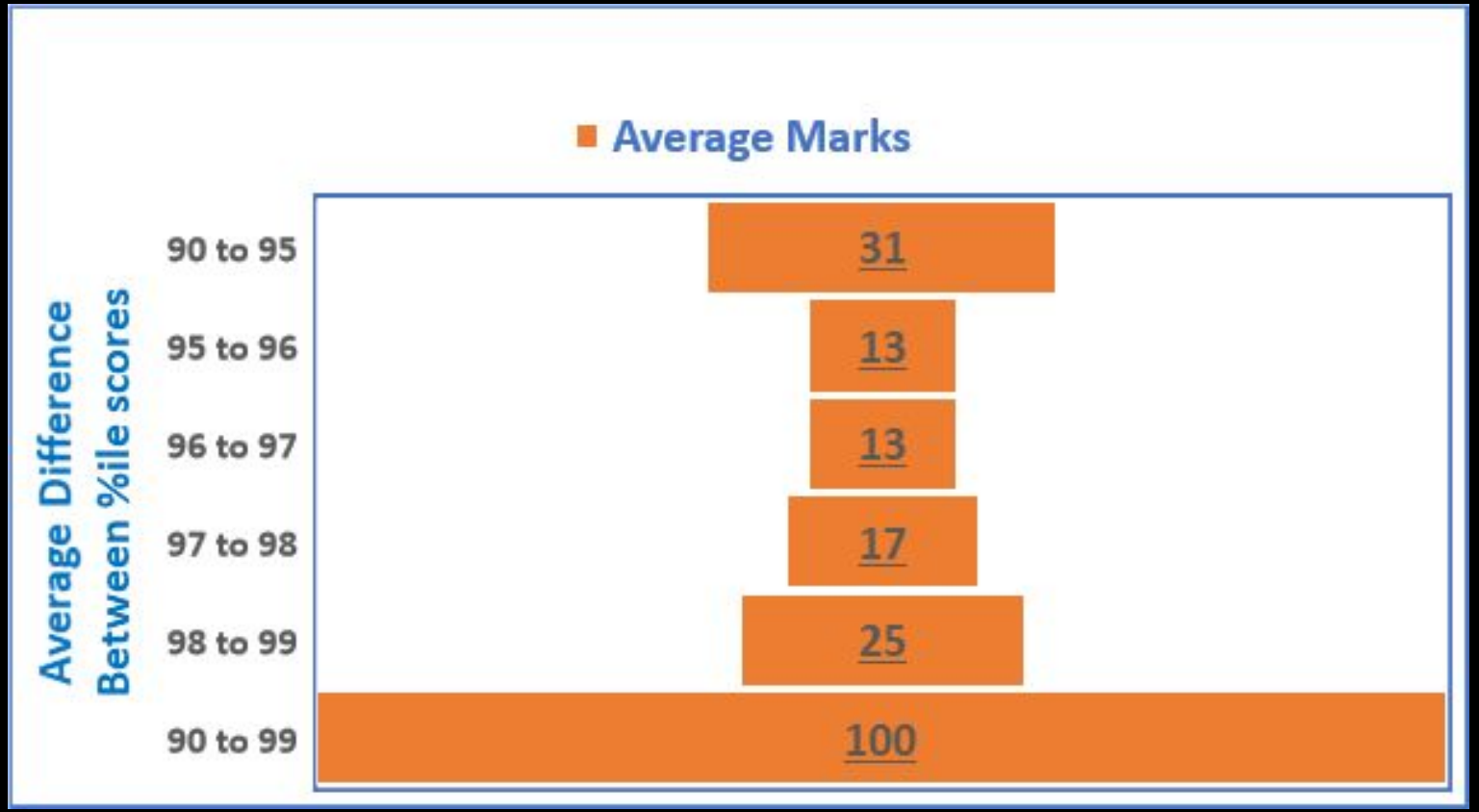

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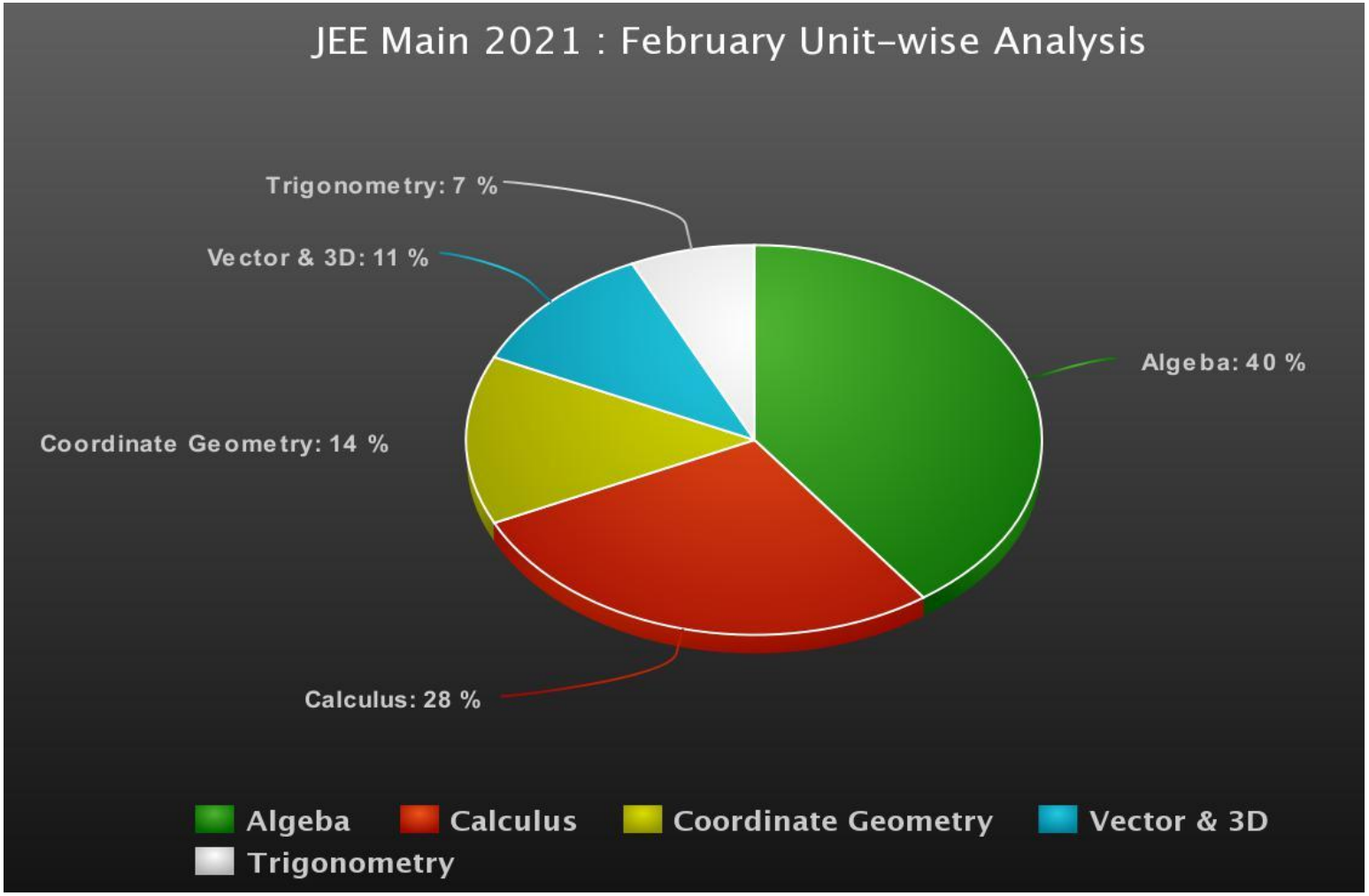
Math


JEE Main 2021 : February Unit-wise Analysis
Trigonometry: 7 %
Vector & 3D: 11 %
Algeba: 40 %
Coordinate Geometry: 14 %
Calculus: 28 %
Algeba
Calculus
Coordinate Geometry
Vector & 3D
Trigonometry

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Chapter Name	24th Feb - I	24th Feb - II	25th Feb - I	25th Feb - II	26th Feb - I	26th Feb - II	Total
MATRICES & DETERMINANTS	3	1	3	3	2	2	13
DEFINITE INTEGRATION	1	2	1	2	3	3	12
PROBABILITY	2	1	2	2	1	1	9
3D GEOMETRY	2	2	2	2	2	2	12
APPLICATION OF DERIVATIVES	2	2	3	1	1	1	10
SEQUENCE & SERIES	0	2	1	1	2	2	8
FUNCTIONS	1	2	1	2	1	2	8
STRAIGHT LINES	2	2	1	2	1	1	9
BINOMIAL THEOREM	1	0	1	2	2	1	7

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Chapter Name	24th Feb - I	24th Feb - II	25th Feb - I	25th Feb - II	26th Feb - I	26th Feb - II	Total
CIRCLES	1	1	0	1	1	3	7
DIFFERENTIAL EQUATION	1	1	1	1	2	1	7
VECTOR ALGEBRA	1	2	2	1	2	1	9
PERMUTATION & COMBINATION	1	1	1	1	1	1	6
COMPLEX NUMBERS	1	1	1	1	1	1	6
CONTINUITY & DIFFERENTIABILITY	1	2	1	1	1	1	7
LIMITS	2	0	1	2	1	1	7
QUADRATIC EQUATIONS	1	1	1	1	1	1	6
APPLICATION OF INTEGRATION	1	1	1	0	1	1	5
MATHEMATICAL REASONING	1	1	1	1	0	1	5
TRIGONOMETRY	1	0	1	1	2	0	5

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Chapter Name	24th Feb - I	24th Feb - II	25th Feb - I	25th Feb - II	26th Feb - I	26th Feb - II	Total
ELLIPSE	0	1	1	1	0	1	4
INVERSE TRIGONOMETRIC FUNCTIONS	0	1	0	1	1	1	4
HEIGHT & DISTANCE	1	1	1	0	0	0	3
HYPERBOLA	0	0	1	1	0	0	2
INDEFINITE INTEGRATION	1	0	1	1	0	0	3
PARABOLA	1	0	1	0	0	0	2
STATISTICS	0	1	0	0	0	1	2
RELATIONS	0	0	0	0	1	0	1
SETS	1	0	0	0	0	0	1

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EASY KILL TOPICS

Matrices and Determinants
Sequences and Series
Vectors and 3-D Geometry
Mathematical Reasoning
Statistics
Differential Equations
Limits, Continuity and Derivatives
Quadratic Equations
Complex Numbers
Straight Lines
Area under the curve with BASIC INTEGRATION

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Matrices and Determinants	• Multiplication of matrices • System of Equations • Properties of determinant • Properties of adjoint/inverse/transpose
Probability	• Conditional Probability • Binomial Distribution • Classical • Bayes' Theorem
Sequences and Series	• AP Problems • AM-GM inequality • GP Problems • AGP

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Mathematical Reasoning	• Laws or truth table • Negation • Contrapositive
Sets, Relation & Function	• Sets • Relation • Function
Binomial Theorem	• General term & Binomial coefficient • Middle term & Greatest term • Questions on Properties

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Permutations and Combinations	• Arrangement problems • Selection problems
Complex Numbers	• Basics & Algebra of complex number • Argument & Conjugate • Polar & Euler form • Cube root of unity
Quadratic Equations	• Basics & Sum and product of roots • Common roots • Sign & Range problems

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Statistics	• Mean • Variance & Standard deviation • Mean Deviation • Magic Table
Trigonometry	• Trigonometry Equations • Inverse Trigonometric Functions • Height & Distance

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Limits, Continuity and Derivatives	• LH rule • Continuity & Differentiability • Chain rule • Implicit differentiation • Parametric differentiation • Higher Order Derivatives • Limits of the Form $\lim_{x\to a}(f(x))^{g(x)}$ Form : $0^0, \infty^0$ Form : 1∞

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Application of Derivatives	• Tangent Normal problems • Increasing Decreasing Problems • Local Maxima and Minima problems • Rolle's theorem & LMVT • Rate change problems

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Integration Indefinite Integration	• Integration by substitution • Integration by parts • $\int_a^b f(x)dx = \int_a^b f(t)dt$ • $\int_a^b f(x)dx = \int_a^b f(a+b-x)dx$ • $\int_{-a}^{a} f(x) = \begin{cases} 2\int_0^a f(x)dx & , \text{ if } f(-x) = f(x) \\ 0 & , \text{ if } f(-x) = -f(x) \end{cases}$

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Area under the curve with BASIC INTEGRATION	• AREA UNDER THE CURVE • Between 2 curves
Differential Equations	• Variable Separable form • Homogenous DE • Linear DE/ Bernoulli
Vectors	• Dot & Cross products • Scalar Triple Product • Vector Triple Product • Projection

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
3D Geometry	• Equation of Plane passing through point/points and parallel to plane • Distance between line and plane • Intersection of planes
Straight Lines	• Equation of Line • Image of a Point • Area of Triangle
Coordinate Geometry - I	• Circles • Equation of tangent to Parabola
Coordinate Geometry-II	• Ellipse • Hyperbola

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Chemistry

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Chapter Name	24th Feb - I	24th Feb - II	25th Feb - I	25th Feb - II	26th Feb - I	26th Feb - II	Total Questions
Aldehyde, ketones & carboxylic acids/ Alcohol phenol & ethers	2	3	2	2	2	3	14
Generals of Chemistry	2	2	2	2	3	3	14
Hydrogen & s and p block	2	2	2	3	3	2	14
Amines	2	3	2	3	2	1	13
Redox reactions & Electrochemistry	3		1	2	2	2	10
Chemical kinetics & Surface chemistry	2	1	2	2	1	2	10
Polymers and biomolecules	2	1	2	1	2	2	10
Thermodynamics	1	2	2	1	1	1	8
Coordination chemistry	1	1	1	3	1	1	8
Hydrocarbons, alkyl and aryl halides	2	2	1	1	1	1	8

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Chapter Name	24th Feb - I	24th Feb - II	25th Feb - I	25th Feb - II	26th Feb - I	26th Feb - II	Total Questions
Principles and process of metallurgy	2	1	1	2	1	1	8
Equilibrium	2	1	2	1	1	1	8
Some basic concepts	1	1	2	2		1	7
States of matter+Solid state	1	1	1	1	2	1	7
Periodicity in properties	1	1	1		2	2	7
Analytical & Chemistry in everyday life		2	1	1	1	2	7
Atomic structure	1	1	1	1	1	1	6
Environmental chemistry	1	1	1	1	1	1	6
D and f block		2	1		2		5
Chemical bonding	1	1	1	1		1	5
Solutions	1	1	1		1	1	5

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1)Aldehydes/Ketones/ Acids
2) GOC
3) Atomic Structure
4) Electrochemistry and Redox
5) s and p Block Elements
6) Coordination Chemistry
7) Hydrocarbons/Haloalkane/ Haloarenes
8) Biomolecules/Polymers
9) Alcohols/Phenols/Ethers
10) Metallurgy
11) Periodic properties
12) Surface Chemistry
13) Amines
14) Environmental/Chemistry in everyday life
15) Atomic structure
16) States of matter/Solutions

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CHAPTER	ORGANIC MOST IMPORTANT CONCEPTS (repeated)
General organic Chemistry	• IUPAC nomenclature • Geometrical and stereoisomerism • Order of strength of acids and base • Addition via Markovnikov's and anti Markovnikov's rule • Elimination reactions E^1 and E^2 • S_N1 and S_N2 reactions
Aldehydes, Ketones and Carboxylic acids	• Base catalysed reactions • Questions based on characteristic tests • Reaction with tollen's reagent • Cannizzaro Reaction • Clemmensen reduction and wolff-kishner reaction

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CHAPTER	ORGANIC MOST IMPORTANT CONCEPTS (repeated)
Alcohol, Phenol and Ether	• Methods of preparation of alcohol • Oxidation of alcohol and phenol • Chemical reactions

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CHAPTER	ORGANIC MOST IMPORTANT CONCEPTS (repeated)
Amines	• Characteristic identification of amines • Gabriel phthalimide and carbylamine reaction • Diazonium salts
Biomolecules	Scoring topics glucose and fructose • DNA and RNA • Reactions of glucose and fructose • Structure of proteins • Vitamins
Polymers	• Monomers and uses of some polymers like bakelite, polythene, polyester, nylon

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CHAPTER	INORGANIC MOST IMPORTANT CONCEPTS(repeated)
Some basic concepts	• Stoichiometric calculations • Mole concept • Calculations based on concentration
Atomic Structure	• Determination of wavelength and energy of electron in Bohr's orbit • Calculation of radii of orbits • Quantum numbers and related calculations • Electromagnetic radiation • Magnetic properties

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CHAPTER	INORGANIC MOST IMPORTANT CONCEPTS(repeated)
Coordination Compounds	• Nomenclature • Isomerism • Structure of complex compounds
States of Matter/Solid state	• Type of unit cells and Bravais Lattice • Calculations involving radius and density • The ideal gas equation • Properties of liquids

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CHAPTER	INORGANIC MOST IMPORTANT CONCEPTS(repeated)
Periodic Table and periodicity	• General trends in the periodic table • Periodicity in properties • Electron gain enthalpy • Ionization enthalpy • Anomalous behaviour
Chemical Bonding	• VSEPR theory and related question • Calculation of bond order, bond length and bond energy for molecules and ions • Lattice enthalpy

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CHAPTER	INORGANIC MOST IMPORTANT CONCEPTS(repeated)
Metallurgy	• Methods of extraction of elements • Ores and minerals • Refining methods
S and P block of elements	• Trends in their chemical properties • Reactions of elements • Structures of fluorides, oxides of xenon and interhalogen compounds • Phosphorus pentachloride, phosphorus trichloride, diborane, $SiCl_4$, BF_3, silicates

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CHAPTER	INORGANIC MOST IMPORTANT CONCEPTS(repeated)
d and f block	• Variation in properties in periodic table • Lanthanide and actinide contraction • Magnetism, bonding, colour of compounds, formation of complexes • Potassium permanganate and potassium dichromate

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CHAPTER	PHYSICAL MOST IMPORTANT CONCEPTS(repeated)
Thermodynamics	• Calculation of gibbs free energy change • Phase transitions • Enthalpy change • Spontaneity
Chemical Equilibrium/ Ionic Equilibrium	• Equilibrium constants • Law of chemical equilibrium • Le Chatelier's principle and henry's law • Acid, base and salts, common ion effect • Buffer solution, pH scale

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CHAPTER	PHYSICAL MOST IMPORTANT CONCEPTS(repeated)
Redox reaction/ Electrochemistry	• Nernst equation • Conductance of electrolytic solutions and conductivities • Cell reactions • Kohlrausch's Law

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CHAPTER	PHYSICAL MOST IMPORTANT CONCEPTS(repeated)
Solutions and colligative properties	• Henry's Law and Raoult's Law • Deviation from Raoult's law and azeotropes • Calculation of molecular mass using colligative properties
Chemical Kinetics	• Arrhenius theory • Rate law and rate constant • Half lives • Activation energy • Effect of temperature on rate law equations

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CHAPTER	PHYSICAL MOST IMPORTANT CONCEPTS(repeated)
Surface Chemistry	• Freundlich and langmuir adsorption isotherm

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Physics

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Topics	24th Feb-I	24th Feb-II	25th Feb-I	25th Feb-II	26th Feb-I	26th Feb-II	Total Questions
Electromagnetic Field		1	3	1			5
Electromagnetic Induction		1	2			1	4
Capacitance	1			1	1	1	4
Current Electricity	2	1		1	1		5
Electrostatics	1	2	2	3	2	3	13
Alternating Current	1	1		1	2	1	6
Heat Transfer	1				1		2
KTG & Thermodynamics	2	3	3	3	1	2	14
Calorimetry & Thermal Expansion	2						2
Rigid Body Dynamics	1	1		1	1	1	5
Centre of Mass	1	2			1		4

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Topics	24th Feb-I	24th Feb-II	25th Feb-I	25th Feb-II	26th Feb-I	26th Feb-II	Total Questions
Rectilinear Motion & Vectors	1	1	1	2		1	6
Gravitation	3	1	3	1	3	1	12
Unit & Dimension	2		3	1	1	1	8
Elasticity & Viscosity		1	1		1	1	4
Friction	2				1		3
Surface Tension	1				1		2
Circular Motion			1		1		2
Work, Power & Energy			1	1			2
Error in Measurement		1	1				2
Newton's Laws of Motion					2	1	3

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Topics	24th Feb-I	24th Feb-II	25th Feb-I	25th Feb-II	26th Feb-I	26th Feb-II	Total Questions
Projectile Motion						1	**1**
Semiconductors	2	3	1	3	2	2	**13**
Electromagnetic waves & communication	1	1	1	1	2	1	**7**
Modern Physics	3	4	1	4	2	2	**16**
Nuclear Physics			1			1	**2**
Geometrical Optics & Physical Optics	1		2			3	**6**
Wave Optics	1	1	1	1	1		**5**
SHM	1	2	1	3	1	4	**12**
Sound Waves		1	1			1	**3**
String Waves		1		1	1		**3**

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- CURRENT ELECTRICITY
- THERMODYNAMICS
- KTG
- EMI
- RAY OPTICS
- MODERN PHYSICS
- GRAVITATION
- SHM
- ROTATIONAL MOTION
- COM+COLLISION
- FLUID MECHANICS
- ELECTROSTATICS
- CAPACITANCE
- SEMICONDUCTOR
- WAVE OPTICS

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Motion in 1D	• Stopping distance • Equation of motion • Free fall-two bodies at the same time • Graphs
Motion in 2D	• Projectile motion • vectors
Laws of motion	• String -block and pulley-block. • Apparent weight inside a lift • Equilibrium of a body • Coefficient of friction • Block on an inclined plane(most repeated) • Block held stationary against a wall • Problems are combined with rotational motion

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CHAPTER	MOST IMPORTANT CONCEPTS (Repeated)
Elasticity	• Change in length of a wire due to stress • Work done in stretching • Problems from this section are generally combined with thermal expansion, SHM, waves on a string and mechanics • Bulk modulus
Thermal expansion	• Thermal stress (two rods fixed between rigid support then heated or cooled) • Relation among coefficients of expansion

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CHAPTER	MOST IMPORTANT CONCEPTS (Repeated)
Calorimetry & Heat Transfer	• Calorimetry problems are similar as they all involve just equating heat lost to heat gained • Heat loss of bullet embedded in wood • Effective thermal resistance of composite slab, concentric cylinders or spheres. • Temperature at the interface of two slabs, T shape, Y shape or any other shape. • Stefan's law- power radiated by a body- radiant energy received on earth • Newton's cooling

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Work, Power and Energy and Collisions	• Vertical circle • Work calculation when force and displacement are given in vector form • Work done by spring force- • spring -mass • Power • Combined with collisons(Energy loss due to collision/ final speed after collision) • Collision in 2D

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
COM & Rotational motion	• Body breaks into two parts during motion, velocity of COM • Finding coordinates of COM(a portion of body is cut out) • MOI of rigid body using theorem of perpendicular and parallel axis • Torque and rotational equilibrium • Angular velocity and conservation of angular momentum • Two discs placed on top of each other • Circular disk or cylinder as pulley, cylinder and rope • Rod pivoted at one end • Rolling without slipping

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Gravitation	• Gravitational potential energy • Energy required to launch a satellite into a orbit + energy to move from one orbit to another+ orbital time period • Escape velocity • Variation of g with altitude and depth • Graphs • Variable mass density problems

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Fluid Mechanics	• Pressure due to two immiscible liquids • Terminal velocity • Excess pressure - soap bubble(work done to blow a bubble) and water droplet • Work done by surface tension • Buoyant force • Equation of continuity and bernoulli's theorem • Velocity of efflux • Capillary rise

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CHAPTER	MOST IMPORTANT CONCEPTS (repeated)
Kinetic theory of gases	• rms speed • Molar specific heats • Mixture of gases - ratio of Cp and Cv, calculation of thermal energy, internal energy and total energy • Degrees of freedom • Mean free path

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CHAPTER	MOST IMPORTANT CONCEPTS (repeated)
Thermodynamics	• Calculation of work done or change in internal energy of system using first law of thermodynamics for various processes • Adiabatic process • Work done and efficiency of cyclic process • Carnot engine • Indicator diagrams ○ (representation of same process in different state variables)

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CHAPTER	MOST IMPORTANT CONCEPTS (repeated)
SHM	• Equation of SHM • Phase difference • Spring-block system (parallel and series combination) • Change in time period of pendulum with length and mass • Time period when point of suspension accelerates(lift, inclined plane and circular turn) • Spring block rotation on a table

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CHAPTER	MOST IMPORTANT CONCEPTS (repeated)
String Waves & Sound waves	• General equation of travelling wave • Tension in the string • Interference of waves • Stationary waves • Organ pipes and resonance column • Intensity of wave • Doppler effect+beats • Pressure wave

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Electrostatic field	• Charge configuration in equilibrium • Force between two charged conductors after contact • Field due to variable charge density (density as a function of r) • Flux involving cube • Field due to dipole

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Electrostatic potential	• Work done in moving a charge between two points • Potential of concentric spherical shells • Graph of variation of potential and electric field with distance • Potential energy of system of charges • Motion of charged particle in an uniform electric field
Capacitance	• Dielectric filled between capacitor plates • Equivalent capacitor • Energy stored in a capacitor • Charging and discharging

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CHAPTER	MOST IMPORTANT CONCEPTS (repeated)
Current Electricity	• Equivalent resistance • Power and heating effect • Potentiometer and metre bridge • Combination of cells
Moving charges and magnetic effects of current	• Lorentz force, circular motion of a charged particle in magnetic field and helical motion • Net magnetic field at a point due to current carrying conductors in various shapes • Magnetic field of circular loops (two loops arranged parallel and perpendicular to each other) • Solenoid and toroid • Galvanometer • Magnetic moment

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CHAPTER	MOST IMPORTANT CONCEPTS (repeated)
Electromagnetic Induction and Alternating Current	• Induced emf (varying magnetic field, varying area, rotation of loop) • Motional emf • Mutual inductance and self induction • LCR circuit problems, Power factor • Phase difference • Resonant frequency • Efficiency of transformer

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CHAPTER	MOST IMPORTANT CONCEPTS (repeated)
Ray Optics	• Inclined mirrors + number of images formed • Mirror equation • Lateral shift • Apparent depth • Relation between critical angle and refractive index (fish looking up through water surface • Minimum deviation and prism • Lens makers formula +thin lens equation • Combination of lenses (concave and convex lens separated by a distance, plano concave and plano convex lens) • Velocity of image • Lenses and glass slab (shift in the position of images) • Magnification of compound microscope and telescope

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CHAPTER	MOST IMPORTANT CONCEPTS (repeated)
Wave Optics	• Interference conditions, maximum and minimum intensity • Diffraction due to single slit (angular direction of maxima or minima and central maxima width • Young's double slit experiment • Malus law

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Dual nature of matter	• De Broglie wavelength(sometimes combined with collision) • Photoelectric effect -work function , threshold frequency, maximum velocity (kinetic energy) of ejected electrons, stopping potential • graphs
Atoms	• Energy required for electron excitation • Transition of electrons(diagram, frequency and wavelength of emitted radiation) • Radii and energy levels of possible orbitals for a given central potential U(r)

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CHAPTER	MOST IMPORTANT CONCEPTS(repeated)
Nuclei	• Decay constant, half life • Binding energy • Energy released due to fission • Alpha and beta decay

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CHAPTER	MOST IMPORTANT CONCEPTS (Most repeated Topics)
EMW	• Equation of electromagnetic wave • Relation between electric field component and magnetic field component • Force on charged particle due to electromagnetic wave • Energy density
Semiconductors	• Concentration of electrons and holes • Mobility of electrons • Diodes circuit • Band energy • Zener diode as voltage regulator • Photo diode • Logic gates + boolean expression + input and output signals