

Course Planner for LEADER Batch (Class 13th Student)

PHYSICS COURSE SCHEDULE

JEE Yearlong Physics for Class 13th of JEE Main and Advanced 2021 by MS Sir

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
Error + Vectors (4)	1	Scaler and Vector , Laws of Vector , Vector Addition - Triangular Law , parallelogram law , polygon law
	2	Product and Division of Scaler with vector , unit Vector , Component of Vectors in X-Y-Z Direction , Product of Vectors : Double Product & Triple Product
	3	Error Analysis - Systematic and Random Error , accuracy and Precision , Error in Measurement , Relative and Absolute Error , Significant Error
	4	DISCUSSION
1 D Motion (4)	1	position Vector , Velocity , Speed and Acceleration , Avg. and instantaneous Value , Distance and Displacement , tangential & Centripetal acceleration
	2	ST Line Motion & Curvilinear Motion ,Constant acceleration and Equation of Motion , Variable Acceleration
	3	Graph s-t , v-t ,a-t , s-v etc . conversion , area and slope of Graph , Motion under gravity
	4	DISCUSSION
Projectile (4)	1	Component Along Horizontal - Vertical , Time of Flight and Range of Projectile , Maximum Angle for Maximum Range , Hieght and Time ,Complementary angle of Same Range
	2	Radius of Curvature ,Ground to Ground ,Ground to Space , Space to Ground Projectiles , Equation of Trajectories
	3	Projectile on Inclined plane
	4	Discussion
Circular kinematics (2)	1	Angular Displacment , Angular Velocity and Angular Acceleration , Uniform and non uniform circular motion
	2	Equation of Motion under Uniform circular Motion + Discussion
Relative Motion (4)	1	Relative Motion in 1 D , Constraint Motion , River Man Situation
	2	Rain- Man Situation , Wind Aeroplane Situation

	3	General Example of Relative Motion between Projectiles
	4	Discussion
Newton Law's of Motion + Friction (7)	1	Type of Forces , external and internal forces , Concept of Momentum , Newtons Law , Free body diagram , equilibrium of forces
	2	conservation of momentum , Net Force and impulse ,
	3	Interial and Non- Interial Frame of reference + Pseudo Force
	4	Static and Kinetic Friction , angle of Friction , Friction on incline , angle of repose
	5	Multiple Friction , Rolling Friction and Lubrication
	6	Spring balance , Weighing Machine , Spring contraction , Pulley and its constraint
	7	Virtual Work + Discussion
Circular Dynamics (3)	1	Centripital Forces , Conical Pendulum , Rotating Particle in spherical shell , cylindrical shell ,
	2	bending of cyclist , banking of roads and Role of Friction , Limiting friction in spherical Shell
	3	Discussion
WORK , POWER AND ENERGY(6)	1	work of constant forces . Central and non central forces , Conservative Forces and Potential energy
	2	Work -Energy Theorm , Work Done on inclined plane
	3	Concept of Power , instaneous and Avg. Conservation of mechanical energy
	4	Vertical Circular Motion , String & Rod Oscillation, Slacking
	5	Condition of Slacking Via trajectory , Complete Circular Motion
	6	Discussion

Centre of Mass and Collision (6)	1	Defination & Calculation of Discrete and Continous System , COM of Semi-Circular Ring , Half Ring , Hemi-Spherical Shell , Conical Shell Solid Cone ,Triangular Lamina and other Bodies , COM for 2 bodies , cases of cavity
	2	Momentum of System , Accelaration of COM ,Conservation of Momentum and Retainment of COM Cases
	3	System of Variable Mass + Discussion
	4	Impluse and Impule relation with change of Momentum , Coefficient of Restitution , Head on Collision and Oblique Collision
	5	Elastic and Non Elastic Collision & Centric and ecentric collision
	6	Discussion
ROTATIONAL MOTION (10)	1	Introduction , Moment of interia , parallel and Perpendicular axis theorm
	2	MOI Calculation for complex cases including Cavity , Radius of Gyration
	3	Torque and its relation with angular accelaration , cases of zero torque by a force
	4	Rotational Equilibirum , Hinge reaction on rigid body on release
	5	Concept of Pure Rotation , angular Momentum and relation with impulse (Newtons Law of Rotation)
	6	Angular Momentum and Conservative Cases , Rotational Kinetic energy , energy calculation and hinge reaction
	7	Combinatin of rotational + translation Motion , Slipping , Pure Rolling ,Mechanical energy
	8	Conservation in Pure Rolling , Pure rolling in inclined Plane
	9	IAOR and its centre , Locating Centre using IAOR
	10	Discussion and Problems
	1	Equation of SHM , Velocity and Accelaration in SHM , Energy of SHM , Time Period and Angular Frequency in SHM
	2	Two Block system & Combination of Springs in SHM

SIMPLE HARMONIC MOTION(6)	3	Angular SHM
	4	Simple Pendulum , Compound pendulum , Torsional Pendulum
	5	Combination of two or More SHM + Discussion
	6	Discussion
ELASTICITY + CALORIMETRY + THERMAL EXPANSION (6)	1	Elastic Body , Restoring Forces Types of Stress and Strain , Stress -strain Graph , Hookes Law , Measure of Elasticity
	2	Elastic PE , Expansion by Self Weight , Rotation , Temp. and Impurity effect on Elasticity + Dicussion
	3	Mechanical Equivalent of heat , Specific Heat Molar heat Capacity Heat/ Thermal Capacity Latent heat ,
	4	Principal of Calorimetry , water equivalent of calorimeter ,sublimation , condensation + discussion .
	5	Temperature and scales , PE and T graph ,Thermal Expansion /Contraction of a , b , γ . , Application of Bi-Metallic Strips , Cavity , Time loss /Gain by clock
	6	Error in scale reading , apparent expansion of liquid ,anomalous expansion of water + Discussion
KTG (3)	1	Solid ,Liquid , Gas . NTP and STP . Concept of Ideal Gas ,postulates of ideal gas , Ideal gas Equation , Boyle's Law , Charle's law , Gay - Lussac Law ,Avogadro Law .
	2	Degree of Freedom , Maxwell's Law of equipartition of energy , Internal energy , Molecular KE , Molar KE , Energy Distribution .
	3	Maxwell Law of Velocity distribution , Avg. Velcity , RMS Velocity , Mean Speed .mean Free Path + Discussion
THERMODYNAMICS (6)	1	Thermodynamic system ,Surrounding , closed , open , isolated system . n , T, P as system variables ,state of system .
	2	Zeroth law , Thermal Equilibrium ,internal energy , Process - Isothermal , isobaric , Adiabatic ploytropic , equation and graph of process .
	3	Indicator Diagrams , sign Conventions ,work done by gas , work done in different process , heat loss in different process
	4	Internal Energy as state function , First law of thermodynamics ,significance and relations with specific heat Constants ,Slope relations , Free expansion General Expansion , Mixtrue of equivalent specific heat constants , cyclic Process , Work Done
	5	Heat Engine , Efficiency ,Carnot Cycle and its efficiency , carnot theorm , Second Law of thermodynamics , , Kelvin-Planck statement , clausius Statement

	6	Refrigerator , Coefficient of performance (COP)= Heat extracted from cold body/ WD on Refrigerator , (COP) For Carnot reversible Refrigerator
HEAT TRANSFER (4)	1	Modes , Law of Conduction , temp. Gradient . Thermal Resistance and different cases of Series and parallel Combination , Growth of ice , heat current for spherical and cylindrical flow , Questions on Wheatstone and Symmetry .
	2	Radiation , absorptive power , emissive Power and their spectral definition , emissivity , Black body , Prevost Theory of exchange , Kirchhoff's Law and application
	3	Stefan's law and Newton's law of Cooling , Distribution of black body and Wien's Law . Solar Constant and Sun Temp.
	4	Spectral energy + Discussion
ELECTROSTATICS (10)	1	Charge - Definition and its properties , Coulomb's law , Effect of Medium , Electric Field , Electric field Lines .
	2	Electric field , Properties of electric field , Electric Field Due to point charge , arc , ring , line charge, disc , sheet, E-x Graph
	3	Motion of Charge particle in Electric field , Definition of Flux , Gauss Law , Flux by Gauss law .
	4	Electric Field Due to spherical shell , sphere , cylindrical shell , cylinder , thick sheet , Electric Field Within Cavity , Electric field for Variable Charge density
	5	Cond. , charge and Electric Field within Conductor , charge distribution on concentric metallic Shells and Parallel metallic plate , Potential Energy for two and multiple charge system
	6	Electric Potential and Potential Difference , Relation between Electric Field and potential difference , Electric Potential of Point Charge , ring , line charge , spherical shell , solid sphere
	7	Relation between potential difference and Work Done, Equipotential Surface , charge sharing and earthing of conductor , Self energy .
	8	Electric dipole , dipole moment , electric potential and electric field due to electric dipole , dipole in electric field , torque,
	9	SHM of Dipole , point charge , dipole , dipole -dipole interaction , Properties of Conductor , electrostatic pressure , Free Bound Charges , Conductor as equipotential surface
	10	Shielding in conductor + DISCUSSION
GRAVITATION (4)	1	Gravitational Force Field , Potential , Potential energy and comparison with electrostatic +
	2	Definition of 'g' and its variation with height , depth , rotation and shape , Binding energy , escape velocity
	3	Kepler's law , Geo- Stationary and Near Earth Satellite , Long pendulum , SHM if particle in tunnel ,

	4	DISCUSSION
CURRENT ELECTRICITY (8)	1	Current , Drift Velocity ,mobility and relation between Current and drift velocity , Current density , Ohm's law .
	2	Conductivity conductance , ohmic /non ohmic resistance , Resistance in different cases ,Equivalent Resistance , Variation of Resistivity and Conductance with tempeture
	3	Battery , EMF , Equivalent of Circuit elements ,Kirchoff's law
	4	Series and parallel combination of resistance and batteries
	5	Wheat stone bridge , symmetry , PT. Potential ,Nodal analysis , More examples on finding equivalent resistance and Resistance for Cubical frame .
	6	Unbalanced wheatstone bridge , symmetric and non symmetric combinations , Power of resistance , battery , parallel connection in home
	7	Max. Power Transfer theorm (MPTT) , Fuse wire , Galvanometer , ammeter , Voltmeter and their Conversion
	8	Meterbridge + Potentiometer + PO Box + Discussion
CAPACITOR (5)	1	capacitor , capacitance , type of capacitor , capacitance of spherical , cylinder , parallel plate and other capacitor
	2	Parallel plate - Equal and unequal charge case , steady state , charging , Energy of capacitor , force between plates , combinsation of capacitor
	3	Heat loss , dielectric partial and complete , polarization , induced charges , Equivalent Capacitance
	4	Effect of charge in Capacitance , Charing and discharging of capacitor , their equivalent and Equivalent time and battery efficiency
	5	Earthing cases + Discussion
	1	Production of Magnetic Field , Biot Savart law , magnetic Field Lines ,
	2	Magnetic Field Due to St. Wire , Loop ,Arc , sheet , Cylinder trough , solenoid
	3	Magnetic Field Lines , Magnetic Field Due to Moving Charge , E/B Value . Ampere's law , Finding Line Integration of magnetic field
	4	Magnetic Field inside and Outside wires ,Magnetic Field Within Cavity , Magnetic field between sheets , solenoid , Toroid .

MAGNETIC EFFECT OF CURRENT (10)	5	Magnetic Force , Motion in Uniform magnetic field , Circular and Helical Motion
	6	Lorentz Force , Motion under Electric field and Magnetic field , Velocity Selector ,mass spectrometer , force on wire
	7	Effective length in uniform Magnetic field , Force Between parallel wires , Magnetic dipoles , field Lines
	8	Dipole moment ,M of moving charge , field on dipole ,Torque , energy and force on dipole due to Magnetic field
	9	MCG ,Current /Voltage Sensitivity ,Discussion
	10	Discussion
MAGNETISM (4)	1	Earth magnetism , Meridian , Dip angle , dip circle , app. Dip , Vibrational Magnetometer , Mag. Shielding
	2	Meissener effect , Magnetic material and Microscopic explanation
	3	Magnetization variable , Curie law , curie-weiss law , Curie temp .
	4	Hysterises , B Vs H Graph , coercivity , retentivity , Losses + Diccusion
EMI (10)	1	Translational and Rotational of conducting rod in uniform Magnetic field , Accelarating and rotating conducting rod in absense of Magentic field
	2	Magnetic Flux and Faraday Law and Lenz law , Induced Current
	3	Energy Loss , In-out of Magnetic field by a closed body , Horizontal - Vertical Rails
	4	Cases including C , terminal velocity , rotating disc , Cases having Induced EMF and Battery
	5	Disc Rotation about diameter , AC generator , time variation of Mangetic field , Induced EMF inside outside
	6	Finding Potential difference and Induced EMF b/w points , charges flow , impluse , Magnetic Field varition .
	7	Mutual Induction Law , Conentric Coils , Co-axial Solenoid , Self induction Law , Inductor
	8	Inductance , equivalent Inductance of solenoid , toroid , Inductor Combination , Magnetic Energy Density , Growth /fall of current in LR Circuit

	9	LR Circuit , L-C Oscillations , Equivalent time calculation ,comparision with spring - block
	10	Discussion
AC (4)	1	AC Current , Frequency , avg ,RMS ,peak .AC Circuit , Phase angle , Power and power factor , Phasor diagram , resistance , X ,Z , rms value of V and Instantneous value of V across elements .
	2	AC Circuit , R only , L only , C only . Series Circuit : R-L ,L-C , R-C , L-C-R Circuit , resonance and Circuit analysis .
	3	Quality factor ,half power frequency , Parallel AC Circuit , Conductance , Susceptance and admittance
	4	Choke Coil , Transformer + Discussion
PHOTOMETRY + PEE(4)	1	Photon , Power ,intensity , force on beam & Examples .
	2	De-broglie wavelength , matter waves , quantization , particle in a box , bohr Model , Quantization & examples
	3	Photo - electric effect , hertz , hallwachs , einstein explannation , Isolated sphere and PEE Experiment ,stopping potential
	4	I-V Graph and effect of intensity and frequency + Discussion
ATOMIC + X RAYS (3)	1	models of Atom , Bohr Model and equations , V, r ,E dependancy on n and Z . Modified Bohr Model
	2	Excitation - De- excitation energy levels , series , rydberg equation , Recoil and Series Energy , atomic Collision , Motion of nucleus ,failure of Bohr model ,discussion
	3	X rays + Examples + Discussion
NUCLEAR + RADIOACTIVITY (3)	1	Nucleons , Isotope , isotone , isobar , binding energy and mass defect , Nuclear Forces , BE/A , Stability , Fission ,Fusion
	2	BE/A Graph , Nuclear reaction , Q value , Nuclear Decays , alpha , beta , gamma Decay
	3	Activity , law of radioactivity , Half Time ,Avg. Time , decay constant , soddy and Fajan's Rule Series , arallel disintegration , Equivalent decay constant
	1	Reflection ,Laws of reflection vector Law , Plane mirror , Plane mirror deviation , Field of View , object - image velocity, no. of images
	2	Spherical Mirror - Concave /convex , focal length , mirror formula , newtons formula , object - image speed , u- v Graph

RAY OPTICS (12)	3	Refraction ,Law of Rrefraction , Vector Law , Refractive index , Refraction in multiple parallel mediums , Rectangular Slab , lateral shift	
	4	shifting by slab , TIR and critical angle , Graph b/w deviation and angle of incidence .	
	5	Circle of illuminance, optical fibre , Mirage , Looming + Examples	
	6	Prism , graph b/w deviation and angle of incidence , No emergence prism , $i'=0$, small angled prism	
	7	Cauchy 's Formula , Dispersion , Dispersive Power , Prism Combination , achromatism , Spherical refraction , formula F1 and F2 .	
	8	Spherical Refraction examples , Lens Formula , Magnification , obj-image Velocity , cutting -splitting	
	9	Lens Combination , power ,silvering of lens , Displacement Method , lens Defect , Achromatic combination	
	10	Simple Microscope , Magifying power , Compound Microscope .	
	11	Astronomical telescope , Resolving power and comparision ,lens cameras and Focal length , eye defects , myopia , hypermetropia , presbyopia , astigmatism	
	12	Discussion	
	STRING WAVE (4)	1	Equation of Wave , particle Velocity and accelaration , Speed of transverse waves on string ,energy in waves
		2	Superpostion , Principal interference of waves
3		reflection and transmission between 2 strings	
4		Equation of Standing Waves (Stationary Wave) , Stationary wave in String , vibration in sttring wave , Sonometer Wire	
SOUND WAVE(6)	1	Equation of Pressure Wave , Velocty , Newton's and laplace Formula , Loudness and Intensity , energy in Sound Waves	
	2	Interference of waves ,reflection and Refraction	
	3	Standing wave (Organ pipe) , resonance Tube , Quinck's Tube , Kund's Tube	
	4	Beats , Doppler's Effect (Sound Wave)	

	5	Complete Wave Discussion
	6	Complete Wave Discussion
WAVE OPTICS (4)	1	Huygens hypothesis , wave front , secondary wavelets , laws of reflection /refraction , failure
	2	YDSE , Intensity , Variation on screen , no. of maxima & minima on screen , Optical path , slabs on slits
	3	bi and multi chromatic , white light , Medium change , screen movement , Multi slits , shape of fringes , lloyd's Mirror
	4	Thin Film interference , Newtons Ring + Discussion
POLARIZATION + DIFFRACTION	1	Polarization , polaroid , malus and Brewster Law , Scattering , Diffraction , fresnel/Fraunhofer diffraction , slit/Circular Hole , resolution
EM WAVES	1	Maxwell's Displacement current and Ampere's law failure , hertz Experiment , wave Eqn , Poynting vector , Specturm of EM Waves
FLUID STATICS (6)	1	Ideal Fluid - Density , Relative density , specific gravity , density of mixture , no shearing stress and shape of free surface , Pressure in Uniformely accelarted (Horizontally and Vertically) , and Rotating systems
	2	Closed Acceleration container , spilling liquid in rotating cylindrical container and accelerating container , U tube , Vertical ring , Other Examples Rotating and accelerated U tube
	3	Force of Liquid on Container Base and Side walls .Force on surface , centre of force and other force examples .
	4	Pascals's Principal ,
	5	Archimedes Princial , Buoyant Force , Centre of Buoyancy , Floating Stability in Floating .
	6	Discussion
FLUID DYNAMICS (5)	1	Ideal Fluid , Steady and turbulent flow , Streamlime flow ,Equation of Contiunity .
	2	Bernoullie's Equations ,Energy of liquid , PE ,KE Pressure energy
	3	Application of Bernoullie's Principal : Magnus effect , helicopter ,aeroplane , atomiser , venturimeter .
	4	Static and Dynamic pressure point , pitot tube , siphon , velocity of efflux , Toricelli's theorm ,

	5	Force on container + Discussion
SURFACE TENSION + VISCOCITY (4)	1	SURFACE TENSION : Surface tension , and Cohensive Forces , Soluble impurity , partially soluble impurity ,Contamination , Electrification , Surface tension Force , Surface energy ,
	2	excess pressure , angle on contact , effect of impurity on T , Capilliray tube , and Liquid rise in capillary tube , Liquid between two plates
	3	VISCOCITY : Viscous Force , its unit in SI and CGS , Viscous Flow in Steady state in cylinder , Parabolic Distance of velocity , Poiseuille equation ,Flow resistance
	4	Terminal Velocity of drop , Stoke's law ,Reynolds No. ,coefficient of viscocity for liquid , gases .
ELECTRONIC DEVICES(4)	1	Concept of Holes in semi-conductor , Intrinsic ,extrinsic ,doping , N type ,P type , Mass action law , P-N Junction ,diffusioin , drift current , potential barrier , depletion layer , Diode- Forward & Reversed Biased
	2	Zener and avalanche breakdown , application of diode LED ,photodiode ,solarcell ,Zener diode ,rectifier - Full wave , half wave ,Bridge recitifier
	3	Transistor , E,B,C, npn ,pnp . Region of Working , Common base , Common emiiter Common collector , input output charateristics
	4	Logic gates : OR ,AND, NOT , NOR,NAND , XOR, XNOR Gate . Boolean algebra ,truth table , Elec. Analogue and Circuit diagram
COMMUNICATION (2)	1	Communication and Element of Communication System , types , basic definitions tranducer , noise , signal ,attenuation , Prop. Of EM waves , Ground ,Sky ,space Communication
	2	Modulation : AM ,FM ,PM , Modulation Index , Band Width Sq.law Device ,Band Pass Filter , Demodulation ,IP Stage , Envelope Detector , Cmax.

CHEMISTRY COURSE SCHEDULE

JEE Yearlong Physical & Inorganic Chemistry for Class 13th of JEE Main and Advanced 2021 by JH Sir

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
MOLE CONCEPT-5	1	Introduction to mole (Basics),mole calculation
	2	Vapour Density/ Avg atomic mass/Avg molecular mass,
	3	Rxn Stoichiometric, Limiting reactants, percentage yields
	4	Percentage Purity, mixture,parallel/sequential Degree of dissociation
	5	Empirical and molecular formula,POAC
Solid State-7	1	Introduction, Basic definition, Unit cell / Bravais lattices
	2	Cubic unit cell, Various solved Examples
	3	Packing in solids,Octahedral & Tetrahedral void
	4	Radius Ratio, Packing in ionic solids
	5	NaCl / ZnS / CsCl structure, Na ₂ O / CaF ₂ structure
	6	Defects
	7	Electrical & Magnetic properties
Liquid Solution-6	1	Introduction, Vapour pressure
	2	Rault's Law
	3	Colligative properties, ΔT_b , ΔT_f
	4	Osmotic pressure, Abnormal colligative properties
	5	Non-ideal solution, Distillation / Azeotrope
	6	Henry's law
	1	Introduction, Rate of reaction,Rate law
	2	Zero order,1st order

Kinetics -10	3	2nd order, nth order
	4	Exp. determination of order of reaction, Calculation of 1st order rate constant
	5	Kinetics of parallel reaction, Kinetics of reversible reaction
	6	Kinetics of sequential reaction
	7	Reaction mechanism, Steady state and equilibrium approach
	8	Arrhenius Equation
	9	Collision theory of reaction
	10	Activated complex theory
Radioactivity-3	1	Theories for nuclear stability
	2	Radioactive disintegration series, Radioactive disintegration law, Radioactive Decay
	3	Rock dating, Carbon dating, Nuclear reaction
Thermodynamics (I) -7	1	Introduction, Basic definition, Types of system, State function / path function, Extensive & intensive properties
	2	Reversible & Irreversible process
	3	Work, Heat & Internal Energy, First law of thermodynamics
	4	Enthalpy, Isothermal process, Isochoric process, Isobaric process
	5	Adiabatic process
	6	Comparison between isothermal & adiabatic process, Polytropic process
	7	Various Solved Examples
Thermodynamics (II) -7	1	Carnot cycle, Second law of T.D.
	2	Entropy, Physical significance of entropy
	3	Calculation of entropy, Entropy change for phase transformation, Entropy change for chemical reaction
	4	Third law of thermodynamics, Residual Entropy

	5	Gibbs free energy, Calculation of change in 'G'
	6	Gibb's free energy & non-PV work, Concept of equilibrium
	7	
Thermochemistry -5	1	Introduction, Exothermic & Endothermic reaction, $\Delta H = \Delta U + \Delta n.RT$, Kirchoff's Equation
	2	Enthalpy of reaction, factors affecting ΔH
	3	Enthalpy of combustion, Formulation, Bond Enthalpy, Resonance energy
	4	Enthalpy of sublimation, Enthalpy of atomisation, Ionisation enthalpy, Electron gain enthalpy, Lattice enthalpy, Born-Haber Cycle
	5	Enthalpy of hydration, Enthalpy of solution, Enthalpy of dilution, Enthalpy of Neutralisation
CHEMICAL EQUILIBRIUM-5	1	Introduction, Introduction to equilibrium, Law of mass action
	2	Various types of equilibrium constant, Application of equilibrium
	3	Lechatelier principle
	4	Various solved example (Parallel / Sequential)
	5	Phase diagram of H ₂ O
IONIC EQUILIBRIUM-12	1	Classification, Arrhenius theory of dissociation, Dissociation of H ₂ O, Ph
	2	Calculation of pH of solution containing acid or base
	3	Calculation of pH of solution containing polytropic acid/base & mixture of acid/base
	4	Salt hydrolysis(introduction and theory),Hydrolysis of salt of SA and SB,Hydrolysis of salt of SA and WB
	5	Hydrolysis of salt of WA and SB,hydrolysis of salt of WA and WB
	6	Salt hydrolysis of amphiprotic and polyvalent salt
	7	Buffer solution, Change in pH of Buffer, Buffer index
	8	
	9	Indicators, Double indicator acid base titration

	10	Solubility product
	11	Effect of complex formation on solubility, Effect of hydrolysis on solubility
	12	Precipitation
Electrochemistry-10	1	Introduction, Electrode potential, Daniel cell, $E_{cell} = E_{oxid} + E_{red}$ $\Delta G = -nFE_{cell}$
	2	Representation of cell, Types of half cell, Electrode potential & K_{eq}
	3	Nernst equation, Various Solved Examples
	4	Primary cell / secondary cell
	5	Electrolytic cell, Faraday's law
	6	Various Solved Examples
	7	Sequence of deposition
	8	Conductance / Conductivity, Molar conductance
	9	Kohlraush law
	10	Conductometric titration, Ionic mobility
GASEOUS STATE -5	1	Boyle's law, Charle's law, Pressure law & Avogadro's law, Ideal gas equation, Dalton's law, Grams law
	2	Kinetic theory of gases, Maxwell distribution of molecular speed, Collision theory
	3	Introduction of Vander Waal's equation, Derivation of Vander Waal's equation
	4	Compressibility, Boyle's temperature
	5	Liquifaction (T_c , P_c , V_c)
ATOMIC STRUCTURE-5	1	Rutherford experiment, Planck's quantum theory, Electromagnetic wave, Photoelectric Effect
	2	Bohr Model, Spectrum, Spectral Line
	3	Various solved example, De-Broglie Hypothesis, Heisenberg uncertainty principle
	4	Wave Mecnical Model (Schrodinger equation)

	5	Nodes(Radical, Angular, Nodal plan and Graph of Ψ v/s R, Ψ^2 v/s R, $4\pi R^2\Psi^2$ v/s R)
Surface Chemistry-3	1	Adsorption,Catalyst
	2	Colloidal solution Classification
	3	Preparation & Properties of Colloids,Emulsion
Quantum Number and Electronic Configuration-2	1	"Four types of Quantum Numbers 1) Principle 2)Azimuthal 3)Magnetic Quantum Number 4)Spin Formula of No. of electron / Subshell / orbital in a Shell / Subshell / orbital Numerical Example"
	2	"Rule of Writing electronic Configuration - Aufbau Rule, - Hund's Rule -Pauli's Exclusion Principle, Question on Quantum Numbers, Nodes (Radical Angular), Shapes of Orbital"
Periodic Table-7	1	Introduction, Screening / Shielding Effect, Effective Nuclear Charge
	2	Variation of Effective Nuclear Charge, Atomic Radius, Variation of Atomic Radius in s,p and d-Block
	3	Variation of Size in F-block, Size in Isoelectronic Series, Ionisation Energy and its Variation
	4	Application of I.E , Inert Pair Effect, Electron Gain Enthalpy, Electron Affinity
	5	Electron Affinity and its Variation, Electronegativity, Scale to Measure Electronegativity
	6	Allred-Rochow Scale, Factors Affecting Electronegativity, Applications of Electro Active, Acidic & Basic Character of oxides, Hydration Energy & It's Applications
	7	Discussion
	1	introduction,chemical bond and types of chemical bond
	2	Exceptions to Lewis Octet Rule,Lewis Acid-Base Concept,comparison of lewis acid-base strength
	3	Valence Bond Theory,Types of Orbitals and Their Orientation
	4	Types of Overlapping,Formation of σ , π and δ Bond,Comparison of σ and π Bond Strength
	5	Comparison of Strength of σ , π and δ Bond,Need for Hybridisation ,Hybridisation and Rules for Hybridisation,Hybridisation and Geometry
	6	Types of Hybridisation and Structure of Molecules
	7	Trick to Determine the Geometry of Molecules,Application of VSEPR,Determination of Hybridisation from Structure
	8	hybridisation in reaction intermediate,hybridisation in odd electron species

Chemical Bonding-22	9	calculation of %s character and electronegativity,calculation of $p\pi-p\pi$ and $p\pi-d\pi$ bonds ,drago's rule and bent rule	
	10	bond parameters,bond order and its calculation,bond length	
	11	bond length comparison,bond angle and its compounds,bond energy	
	12	Dipole moment,Applications of dipole moment,polar and nonpolar nature,identification of isomers,calculation of percentage ionic character	
	13	back-bonding,applications of back bonding,Bridge-bonding	
	14	Bridge bond,bridge bonding in different compounds,molecular orbital theory and its features	
	15	molecular orbital theory,filling of electrons in molecular orbitals,bond order,magnetic character and stability of species	
	16	comparison of ionisation energies for molecular and atomic species,Mot for heteroatomic species	
	17	Vander waal Forces,Types of Van Der waal Forces,Comparison of Van Der waal Forces	
	18	Hydrogen Bonding,Condition and Strength of H-bond,Types of H-bonding Comparison of Properties in Intermolecular and Intramolecular H-bonding	
	19	applications of hydrogen bonding-comparison of solubility,comparison of B.P and M.P,comparison of acidic strength,density of water	
	20	ionic bond,covalent characters in an ionic bond,fajan's rule,comparison of polarisation power of cations	
	21	comparison of polarising of cations,comparison of polarizability of anions,applications of fajan's rule-comparison of covalent characters,comparison of thermal stability	
	22	Color of Compounds,Solubility of Ionic Compounds	
	Co-ordination Compound- 13	1	Introduction,Complex Compounds and Double Salts, Central Metal Atom,Ligands and Their Classification
		2	Co-ordination Number,Classification of Ligands on the Basis of Denticity, Chelating Ligands and Chelates
		3	ambidentate ligand,flexidentate ligands,classical and nonclassical ligands, π -donor and π -acceptor ligands,oxidation number
		4	effective atomic number
		5	naming of bridging complexes,werner's coordination theory
		6	valence bond theory(VBT),assumptions of VBT and Important Aspects,Complexes with CN=4
		7	complexes with CN=6 and 5,Limitations of VBT

	8	crystal field theory,crystal field splitting in octahedral field,filling of electrons in octahedral complexes
	9	crystal field splitting in tetrahedral and square planar field,comparison of CFSE,factors affecting CFSE
	10	stability of complex compounds,color of complex compounds,charge transfer spectra
	11	jahn-teller distortion(tetragonal distortion),stability of complexes
	12	isomerism in coordination compounds,structural isomerism,stereoisomerism
	13	isomerism in octahedral complexes
Metallurgy-8	1	Introduction, Method for Metallurgical Extraction, Concentration, Gravity Separation, Magnetic Separation
	2	Froth Floatation, Calcination, & Roasting Flux & Slag
	3	Reduction of oxide to metal, Ellingham Diagram, Reduction by C (smelting)
	4	Reduction of Metal Oxide and Refining of Metals
	5	Metallurgy of Iron
	6	Metallurgy of Copper (Cu)
	7	Metallurgy of Lead (Pb), Metallurgy of silver
	8	Extraction of Aluminium
Types of chemical reactions- 5	1	Acid Base Neutralisation Reaction
	2	Ion Exchange Reaction of Salt
	3	Salt Decomposition Reaction, Reagent -CaCl ₂ ,BaCl ₂ ,AgNO ₃ ,Pb(OAc) ₂
	4	Complex Reaction ,Redox Reaction
	5	Disproportionation Reaction
	1	Introduction, General Physical Properties of Alkali Metals & Alkaline Earth Metals
	2	Solution in Liquid Ammonia , Chemical Properties of Alkali and Alkaline Earth Metals Compounds of Alkali and Alkaline Earth Metals

s-block-5	3	Carbonates & Bicarbonates, Nitrates, Sulphates, Nitrates points of Difference of Li, Diagonal Relationship, Important Compounds of Alkali Metals (Sodium Hydroxide (NaOH))
	4	NaOH, Sodium Chloride (NaCl), Sodium Bicarbonate(NaHCO ₃), Sodium Carbonate (Na ₂ CO ₃)
	5	Anomalous Behaviour of B.E, Important Compounds of A.EM.[MgCl ₂ .6H ₂ O,MgCl ₂ , Calcium Oxide (CaO), CaOCl ₂ , CaSO ₄ .2H ₂ O (Gypsum)]
P-Block Elements-13	1	Introduction, General Properties of P-Block Elements, Inert Pair Effect, Anomalous Behaviour of First Member of Group
	2	Boron Family, Compounds of Boron, Borax, Boric Acid
	3	Diborane & its Properties, Carbon Family & its Properties
	4	Allotropes of Carbon, Important Compounds of Carbon
	5	Silicon and its Compound Silica, Silicates, Silicones
	6	Zeolites, 15th Group Elements, Hydrides of 15th Group Elements Stability, Oxides of Nitrogen, Compounds of Nitrogen
	7	Compounds of Nitrogen, N ₂ - uses of N ₂ , NH ₃ - Preparation, Properties
	8	Test for ammonia, Oxides of nitrogen & their properties, Nitric acid & its properties
	9	Phosphorus and its Compounds, Allotropes of Phosphorus, White Phosphorus, Red Phosphorus, Black Phosphorus, Phosphine(PH ₃), Acids of Phosphorus, Halides of Phosphorus
	10	Oxygen Family, Physical Properties Compounds of 16th Group, 1. Dioxygen(O ₂), 2. Ozone (O ₃)
	11	Sulphur & its Allotropes, Sulphur Dioxide, Sulphur Trioxide, Sulphuric Acid, Oxoacids of Sulphur
	12	Halogen Family & their Compounds
	13	Noble Gases & their Components, Uses of Noble Gases
d and f block-6	1	Introduction, Physical Properties of D-block Elements
	2	Trend in SRP Values, Stability of Higher Oxidation States, Color of Ions
	3	Catalytic Properties, Some Important Compound of D-block, Potassium Permanganate, Potassium Dichromate
	4	Chromyl Chloride Test, Compounds of Zn (ZnO), Compounds of Ag (Ag ₂ O)
	5	Compounds of Copper, Compounds of Iron

	6	Compounds of Mercury, Properties of lanthanides & Actinides
Hydrogen-3	1	Physical & Chemical properties & reactions
	2	Covalent & Metallic Hydrides, Ortho & para Hydrogen, Water & Its Properties, Hard & Soft Water
	3	Properties of Heavy Water, H ₂ O ₂ and its Properties
Salt Analysis/ Qualitative Analysis-5	1	Introduction, Radicals, Classification of acidic radicals, Testing of acidic radicals (weak group)
	2	Identification of anions, Weak group Strong group
	3	Testing of NO ₃ ⁻ , Analysis of Basics Radicals, I group & II group
	4	II-A & II-B group, IIIrd group cations
	5	IV, V & VI group, Dry test, Flame test, Boron Bread test

JEE Yearlong Organic Chemistry for Class 13th of JEE Main and Advanced 2021 by SY Sir

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
General organic chemistry (18)		(a)Effect of electronic displacements
	L : 1	Inductive effect and its types
	L : 2	Application of I-effect
	L : 3	Resonance coridition of resonance method of resonance
	L : 4	Method of resonance, +R and –R group
	L : 5	Stability of resonating sructures.
	L : 6	Aromaticity
	L : 7	Resonace energy
	L : 8	Hyperconjugation
	L : 9	Application of all effect
	L : 10	Application of all effect
	L : 11	Application of all effect
	L : 12	Application of all effect
		(b)Acidic & Basic strength comparism (6)
	L : 13	Audity of diff acids, phenol, & benzoic acid derivatives
	L : 14	Audity of diff acids, phenol, & benzoic acid derivatives
	L : 15	Audity of diff acids, phenol, & benzoic acid derivatives
	L : 16	Basic strength comparism
L : 17	Basic strength comparism	
L : 18	Basic strength comparism	
Classification and Nomenclature of organic compound (11)	L : 1	Introduction, method of presentation of O.C (bond linenotation),
	L : 2	Classification / types of C, H, R-X, R-OH, Amines, Functional group.
	L : 3	Homologous series Degree of unsaturation
	L : 4	IUPAC - Naming, types of alkyl group
	L : 5	IUPAC - Naming, types of alkyl group
	L : 6	IUPAC - Naming, types of alkyl group
	L : 7	IUPAC - Naming, types of alkyl group
	L : 8	IUPAC - Naming, types of alkyl group
	L : 9	IUPAC - Naming, Aromatic compound
	L : 10	Common naming
	L : 11	Mislaneous
Structural isomerism (4)	L : 1	Structural Isomerism (induding tautomerism)
	L : 2	Structural Isomerism (induding tautomerism)
	L : 3	Structural Isomerism (induding tautomerism)
	L : 4	Structural Isomerism (induding tautomerism)
		(a)Geometrical isomerism (4)

Stereoisomerism (19)	L : 1	Difference between structural & stereoisomerism, Introduction of geometrical isomerism
	L : 2	Condition of geometrical isomerism
	L : 3	Naming of G.I. (cis-trans, E-Z, syn-anti)
	L : 4	Properties of G.Isomers, Calculation of G.Is.
		(b)Conformational Analysis(4)
	L : 5	Basic ideas Information for conformational analysis
	L : 6	Conformations in acyclic compounds.
	L : 7	Conformations in acyclic + cyclic compounds
	L : 8	Conformations in acyclic compounds
		(c)Optical isomerism (10)
	L : 9	Introduction, variation of $[\alpha]$, chiral atom.
	L : 10	Elements of symmetry (plane, centre)
	L : 11	Elements of symmetry (AAOS, AOS)
	L : 12	Condition for Optical activity
	L : 13	Methods of representation of diff molecule and their Interconversion
	L : 14	Configuration of compound (D/L- and R/S)
	L : 15	Optical isomerism in compound with one and two chiral centre
	L : 16	Meso compound, Enantiomers, Diastereomers, Racemic mixture
	L : 17	Resolution, optical purity, Enantiomeric excess,
L : 18	Calculation, stereoisomers	
L : 19	Discussion	
Halogen Derivatives (28)		Reaction reagents (2)
	L : 1	Electrophile, nucleophile
	L : 2	Variation of Electrophilicity and nucleophilicity
		Carbocation (2)
	L : 3	General, Generation
	L : 4	General reaction. And its rearrangements
		Important Reaction Involving carbocation (R-X, form + Rxn) (8)
	L : 5	Addition of HX, and H_3O^+ addition with alkenes / alkynes,
	L : 6	Addition of X_2 , IX, NOX,, HO-X with alkenes / alkynes,
	L : 7	Addition of X_2 , IX, NOX,, HO-X with alkenes / alkynes,
	L : 8	
	L : 9	OMDM, HBO
	L : 10	Dehydration of alcohol (E_1 -Reaction)
	L : 11	Pinacol-Pinacolone rearrangement
	L : 12	Demjanov rearrangement, Dienone Phenol
	L : 13	
		Nucleophilic Substitution reaction (SN-RXN)(5)

Halogen Derivatives (20)	L : 14	SN ¹ & SN ²
	L : 15	Comparison of SN ¹ & SN ²
	L : 16	SN _i
	L : 17	Examples of SN reactions of R-X, R-OH, R-O-R
	L : 18	Examples of SN reactions of R-X, R-OH, R-O-R + S _N GP
		Elimination Reaction (5)
	L : 19	E ₁ , E ₂ , E _{1CB}
	L : 20	E ₁ , E ₂ , E _{1CB}
	L : 21	Orientation of E.R
	L : 22	Pyrrolylic / thermal elimination rxn
	L : 23	Dehydration, Dehalogenation
		Free Radical (5)
	L : 24	Introduction, G.M.P, GR
	L : 25	Important reaction involving FR. (Kolbe, Electrolysis, wurtz reaction) and related reactions
	L : 26	Photohalogenation (chlorination, Bromination)
	L : 27	Per-oxide effect, NBS RXn, Pinacol-form n
	L : 28	Hunsdiecker reaction
	Alcohol and Ether (11-12)	
L : 1		Grignard reagent -1
L : 2		Grignard reagent -2
L : 3		Grignard reagent -3
		Reduction of various functional group (4-5)
L : 4		Reduction by H ₂ /cat
L : 5		Reduction by LiAlH ₄
L : 6		Reduction by SBH, BH ₃ -THF/H ⁺ , DiBAL-H
L : 7		Some important reduction
L : 8		Some important reduction
		Oxidation (4)
L : 9		Oxidation -1 (Alkane, alkene, alkyne)
L : 10	Oxidation -2 (Alkane, alkene, alkyne)	
L : 11	Oxidation -3 (R-OH, R-X)	
L : 12	Oxidation -4 (Aldehyde, ketone)	
		Heating effect (2)
	L : 1	Heating effect on various compound -(2)
	L : 2	Heating effect on various compound -(2)
		Nucleophilic addition reaction (2)
	L : 3	Reaction with NaHSO ₃ , HCN, H ₂ O, H ₂ N-Z
L : 4	Reaction with R-OH	

Carbonyl compounds (Aldehyde, ketone) (10)		Name reactions (6)
	L : 5	Haloform reaction
	L : 6	Aldol condensation reaction
	L : 7	cannizaro's reaction
	L : 8	Claisen-sehmidt, perkin, reformalsky,
	L : 9	Knoevengel, claisen-ester condensation, michael addition rxn
	L : 10	Benzil-Benzilic acid rearrangement, benzoin, corey House synthesis
Carboxylic acid derivatives and Amines(7)		Carboxylic acid derivatives (3)
	L : 1	G.M.P (general method of preparation)
	L : 2	G.M.P (general method of preparation and reactions)
	L : 3	General reactions
		Amines (4)
	L : 4	General method of preparion
	L : 5	Aldol condensation reaction and reactions
	L : 6	Aldol condensation reaction and reactions
L : 7	Benzene diazonium chloride and its rxn	
Hydrocarbon -2	L : 1	Alkane, alkene
	L : 2	Alkene, alkynes
Aromatic compound-12		Benzene (5)
	L : 1	G.M.P. and its GR
	L : 2	Activating deactivating effect, and directing effect of different groups towards ESR
	L : 3	Orientation effect in monosubstituted aromatic compound and other aromatic compound towards
	L : 4	Different examples of ESR of Benzene
	L : 5	Different examples of ESR of Benzene
		Phenos (3)
	L : 6	G.M.P
	L : 7	Rxn of Phenol
	L : 8	Rxn of Phenol
		Aniline (3)
	L : 9	G.M.P & GR
	L : 10	G.M.P & GR
	L : 11	Test of phenol and aniline, coupling reactions.
	Chlorobenzene (1)	
L : 12	G.M.P & Rxn.	
		Amino Acid & Proteins (2)
	L : 1	Introduction, classification, physical properties Isoelectroic point
	L : 2	Reaction of Amino acid, protein and its classification
	L : 3	Nucleic acid / Vitamines

Biomolecule (9)		Carbohydrates (4)
	L : 4	Introduction, classification
	L : 5	Structure of monoseccharides (Glucose, fructose)
	L : 6	Reactions of monosaccharides
	L : 7	Disaccharides and polysoccharides
	L : 8	Polymers
	L : 9	Chemistry in every day life

MATHS COURSE SCHEDULE

JEE Yearlong Maths for Class 13th of JEE Main and Advanced 2021 by MS Sir

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
Basic Maths - 10	1	Number System
	2	Indices and Polynomials
	3	Polynomial and Factorization
	4	Factorization and Ratio Proportion, Intervals
	5+6	Modulus function / Absolute value function
	7	Exponential and logarithmic functions
	8	Illustrations on log function
	9+10	Brief Introduction of Greatest Integer Function and Fractional Part Function
Quadratic Equation-7	1	1. Definition of polynomial 2. Quadratic equation 3. Roots of quadratic equation 4. Relation between roots and coefficient of quadratic equation Nature of roots 5. If root of the equation $ax^2 + bx + c = 0$ are a & b then finding equation 6. whose roots are symmetric expressions of a and b
	2	7. Quadratic equation V/S Identity 8. Condition of common roots
	3	9. Rational algebraic inequalities (Method of interval)
	4	10. Graphs of quadratic expressions, $y = ax^2 + bx + c$ 11. Explanation of above graphs
	5	12. Computing the maximum or minimum values of rational function 13. Location of roots 14. General and mixed problem
	6	15. Finding the condition for which a general two degree expression 16. Theory of equations 17. Pseudo quadratic equations
	7	DISCUSSION

Sequence & Series-6	1	1. Introduction 2. Arithmetic progression 3. Summation of n terms of an A.P. 4. Properties of A.P.
	2	5. Arithmetic mean 6. Geometrical progression 7. Summation of n terms of A.G.P. 8. Properties of G.P.
	3	9. Geometrical mean 10. Harmonical progression 11. Harmonical mean 12. Arithmetic mean, Geometric mean & Harmonic mean of 'n' numbers 13. Properties related with Arithmetic mean, Geometric mean & Harmonic mean
	4+5	14. Arithmetic geometric progression 15. Special sequences
	6	Discussion
Inequalities-7	1	Log + Modulus
	2	Modulus Inequality
	3	Graph of Logarithm and Log Inequality
	4	Properties related with Arithmetic mean, Geometric mean & Harmonic mean
	5	Properties related with Arithmetic mean, Geometric mean & Harmonic mean
	6	Cauchy Schwartz Inequality
	7	Jensen's Inequality
Trigonometric Ratio Identities + Trigonometric Equation-6	1+2+3	TRI
	4+5	Trigonometric Equation & Inequation
	6	DISCUSSION
	1+2	1. Cartesian product of two sets 2. Function 3. Domain, Co-domain & Range Of A Function 4. Some Important Functions 5. Algebraic operations on functions
	3	Examples on Domain Range

Function-9	4	6. Equal or Identical Function 7. Homogeneous Functions 8. Bounded Function 9. Implicit & Explicit Function 10. Applications of functional rule 11. Transformations of The graph
	5	12. Classification of Functions
	6	13. Composite of uniformly & non-uniformly defined Functions
	7	14. Inverse of A Function 15. Odd & Even Functions
	8	16. Periodic Function
	9	DISCUSSION
Inverse Trigonometric Function-6	1	1. General introduction 2. Domain, Range & Graph of Inverse trigonometric functions
	2+3	3. Properties of inverse trigonometric function (P1, P2 P5)
	4	3. Properties of inverse trigonometric function (P6, P7)
	5	4. Simplification & Transformation of Inverse functions by elementary substitution and their graphs 5. Equations involving inverse trigonometric functions 6. Identities involving inverse trigonometric functions
	6	7. Simultaneous equations and inequations involving I.T.F. 8. Summation of series
Limit-6	1	1. General introduction 2. Definition of limit 3. Left hand limit and right hand limit of a function* 4. ϵ - δ Definition (A formal definition of limit) 5. Indeterminate forms 6. Five Fundamental Theorems 7. Various Strategies (To evaluate limit)
	2+3	8. Sandwich / Squeeze play Theorem 9. Limits of Trigonometric Functions 10. Limit using Series Expansion
	4	11. Limit of Exponential Functions 12. Limits of the function of the form 1^∞
	5	13. Generalized Formula for 1^∞ 14. limits of functions having built in limit with them
	6	Discussion
Continuity &	1+2+3	Continuity

Differentiability-6	4+5+6	Differentiability
Method of Differentiation-6	1	1. Derivative by first principle 2. Derivative of standard functions 3. Supplementary theorems/result
	2	4. Logarithmic differentiation 5. Parametric differentiation 6. Derivative of $f(x)$ w.r.t. $g(x)$
	3	7. Derivative of implicit function 8. Derivative of infinite series 9. Derivative of homogeneous equation 10. Derivative of inverse function
	4	11. Derivatives of inverse trigonometric function by transforming them into simpler functions 12. Analysis and graphs of some inverse trigonometric functions 13. Successive differentiation
	5	14. Deduction of new identities by differentiating a given identity 15. Derivative of functions expressed in the determinant form 16. L'Hospital's Rule
	6	DISCUSSION
Indefinite Integration-9	1	1. Antiderivative 2. Geometrical interpretation of indefinite integral 3. Antiderivative or reverse phenomenon of differentiating 4. Properties of integration Basic Examples
	2+3	5. Integration by substitution
	4+5	6. Integration by parts
	6	7. Integrals of trigonometric function
	7	8. Integration of rational function
	8	9. Integration of irrational algebraic function 10. Miscellaneous 11. Reduction formula 12. Some integrals which cannot be found in terms of known elementary functions
	9	Discussion
	1	1. Definite integral as the limit of sum 2. The fundamental theorem of calculus
	2	3. Geometrical Interpretation of Definite integral 4. Evaluating definite integrals by finding antiderivatives 5. Walli's theorem
	3+4	6. Properties of definite integral (P1, P2, P3, P4, P5, P6)

Definite Integration-9	5	6. Properties of definite integral (P7) 7. Derivatives of antiderivatives (newton-leibnitz formula)
	6	8. sum of series using definite integration *9. Evaluating integrals dependent on a parameter
	7	10. Determination of function 11. Estimation of definite integral and general inequality in integration
	8	12. Reduction formula 13. Differentiating and integrating series
	9	Discussion
Tangent & Normal-3	1+2+3	Tangent & Normal
Monotonocity-5	1+2+3+4+5	Monotonocity
Maxima & Minima-5	1+2+3+4+5	Maxima-Minima
Differential Equation-6	1	1. Definition 2. Order and degree of differential equation 3. Solving differential equation 4. Formation of A differential Equation 5. General and particular solutions
	2+3+4	6. Elementary types of first order & first degree differential equations
	5	7. General & miscellaneous problems
	6	Discussion
Area Under The Curve-3	1	1. Area under the curves (given by Cartesian equation) 2. Area enclosed between two curves 3. Standard areas
	2	4. Area under various cases
	3	5. Determination of unknown parameters 6. Concept of variable area (greatest and least value)
	1	1. General introduction 2. Co-ordinates system 3. Distance formula 4. Section formula 5. Application of distance formulae
	2	6. Co-ordinates of some particular points 7. Area of a Triangle and condition for collinearity

Straight Line-9	3	8. Brief description of elementary locus (Four basic steps) 9. Straight line 10. Equation of straight Line
	4	11. Different forms of straight lines 12. Position of a point w.r.t. a line 13. Length of perpendicular
	5	14. Reflection of a point 15. Internal angles of triangle 16. Line inclined at an angle to other line(s)
	6	17. Condition for concurrency 18. Family of straight line
	7	19. Transformation of axes 20. Equation of Bisectors of angles between two lines
	8	21. Pair of Straight lines 22. General equation of second degree representing a pair of straight lines 23. Problems on locii
	9	Discussion
Circle-8	1	1. Definition 2. Diametrical form of circle
	2	3. Intercept (Made by the circle) 4. Position of a point w.r.t a circle 5. Parametric equation of a circle
	3	6. Line & A Circle 7. Tangent and normal 8. Director circle Length of Tangent & Power of a point
	4	9. Equation of chord with given middle point 10. Chord of contact
	5	11. Pair of Tangents 12. Family of circles
	6	13. Pole & Polar 14. Common tangents to two circles
	7	15. Radical Axis & Radical Centre 16. Coaxial system of circles
	8	17. Orthogonality of two circles Discussion
	1	1. Introduction to conic sections 2. General equation of a conic 3. Centre of the central conic 4. Standard equation of parabola 5. Shifted parabola
	2	6. Position of a point relative to a parabola 7. Focal distance/focal radii 8. Parametric coordinates 9. Chord joining two points t_1 and t_2

Parabola-7	3	10. Tangents to the parabola 11. Length of chord of the conic intercepted on line
	4	12. Normal's to the parabola 13. Rules of transformation 14. Common tangents to two conics
	5	15. Concept on envelope 16. Pair of tangent 17. Chord of contact
	6	18. Chord with a given middle point 19. Important highlights
	7	Discussion
Ellipse-4	1	1. General equation of an ellipse 2. Deriving standard equation of ellipse 3. Tracing of an ellipse 4. Two standard ellipse 5. Eccentricity Shifted ellipse, Generalized version
	2	6. Position of a point relative to an ellipse 7. Focal distance / focal radii 8. Auxiliary circle/eccentric angle/ parametric coordinates 9. Chord joining two points whose eccentric angles are a & b
	3	10. Tangents to the ellipse 11. Normal's
	4	12. Common articles 13. Important highlights
Hyperbola-4	1	1. General equation of a hyperbola 2. General terminology of hyperbola 3. Two standard hyperbola 4. Shifted hyperbola
	2	5 Conjugate hyperbola 6. Position of a point 'P' w.r.t. A Hyperbola 7. Auxiliary Circle/eccentric angle / parametric coordinates 8. Chord joining two points of hyperbola
	3	9. Tangents to the hyperbola* 10. An important concept 11. Normal's to the hyperbola 12. Common articles
	4	13. Rectangular hyperbola 14. Important highlights 15. Highlights on asymptotes
	1	1. General definitions 2. Angle between vectors 3. Section formula 4. Geometrical results with vectors & problems
	2	5. Vector equation of a line 6. Vector equation of the bisectors of the angles between the lines
	3	7. Test of collinearity 8. Scalar product (dot product)
	4	9. Linear combination 10. Fundamental theorem in plane

Vector-9	5	11. Vector product (cross product) 12. Shortest distance between 2 skew lines
	6	13. Shortest distance between two parallel lines
	7	14. Product of 3 or more vectors
	8	15. Necessary & sufficient condition for coplanarity of four points 16. Fundamental theorem in space 17. Real definition of linearly independent
	9	18. Reciprocal system of vectors 19. Solving vector equation Discussion
3-D- 5	1	1. Coordinates of a point in space 2. Distance formula 3. Section formula 4. Direction cosines of vector 5. Direction cosines of line 6. Direction ratios of a line 7. Relationship between direction cosine & direction ratios
	2	8. Definition of plane 9. Different forms of the equations of planes
	3	10. Perpendicular distance of a point 'P' from a plane $Ax + By + Cz + D = 0$ 11. Angle between two planes 12. Equation of the bisector planes between the planes 13. Family of planes
	4	14. Angle between two planes 15. Condition for line to lie completely in plane 16. Symmetrical form of straight line (Cartesian form) 17. Unsymmetrical form of straight line
	5	18. Coplanarity of two lines 19. Line of Greatest slope in a plane
Complex Number-9	1	1. General introduction 2. Algebra of complex numbers 3. Equality In Complex Number
	2	4. Three Important terms : Conjugate/Modulus/ Argument 5. Representation of a complex in different form 6. Important Properties of conjugate
	3	7. Important Properties of Modulus 8. Important Properties of Amplitude
	4	9. Vectorial Representation of a complex number
	5	10. Angle between lines 11. Condition for lines to be parallel
	6	12. Condition for lines to be perpendicular 13. Straight line & Circles on complex plane
	7+8+9	14. Demoivre's Theorem 15. Cube Root of Unity 16. n^{th} Roots of Unity 17. General locii on complex plane

Permutation & Combination-8	1	1. General introduction & Historical development 2. Fundamental principle of counting 3. Significance / meaning of the title of the chapter
	2	4. Useful theorems (For faster execution rate of the problems), Examples
	3	5. Formatting of groups
	4	6. Permutation of alike objects
	5	7. Circular Permutation
	6	8. Total number of combinations 9. Summation of numbers
	7	10. Distribution of alike objects
	8	11. General / Miscellaneous
Probability-9	1	1. Introduction 2. Basic definitions 3. Venn diagrams
	2	4. Addition theorem 5. Conditional probability 6. Multiplication theorem
	3+4	7. Independent Events 8. Law of total probability
	5	9. Three events defined on an experimental performance 10. Binomial Probability Distribution
	6+7	11. Probability through Statistical (stochastic) Tree diagram 12. Baye's Theorem 13. Extended Bayes
	8+9	14. Geometrical Probability 15. Mathematical Expectation 16. Probability Distribution (for JEE-Mains)
JEE MAINS Topics-5	1	Sets & Relation
	2	Height & Distance & PMI
	3+4	Statistics

	5	Mathematical Reasoning
SOT-4	1+2	1. General introduction 2. Basic Laws 3. Sines/Cosines/Tangent of half the angles in terms of sides of the triangle 4. m-n theorem (cotangent law) 5. Properties of triangle and circles connected with T-ratios and sides of the triangle (Circum-radius & In-radius)
	3	6. Properties of triangle and circles connected with T-ratios and sides of the triangle (Ex-radius) 7. Length of angle bisectors & median 8. Orthocentre
	4	9. Distances between special points 10. Solution of triangle (Ambiguous Case) 11. Regular Polygon 12. Cyclic Quadrilateral
Binomial Theorem-4	1	1. Binomial expression 2. Binomial theorem 3. General term 4. Number of terms in expansion 5. Middle term
	2	6. Numerically greatest term 7. Applications of binomial theorem
	3	8. Properties of binomial coefficients 9. Summation of series
	4	10. Miscellaneous problems on summation 11. Multinomial theorem 12. Multinomial theorem for negative and fractional index *13. Approximation
Determinant & Matrices-8	1	1. Introduction 2. Cofactor and minors of an element 3. Properties of determinants
	2	4. Special determinants 5. Factor theorem
	3+4	6. Multiplication of two determinants 7. Cramer's rule (System of linear equations) 8. Applications of determinant in geometry
	5	1. Definition 2. Special type of matrices 3. Algebra of matrices
	6	4. Properties of matrix multiplication 5. Positive integral powers of a square matrix 6. Matrix polynomial 7. Characteristic equation 8. Definitions
	7	9. The transpose of a matrix : (Changing rows & columns)10. Orthogonal matrices 11. Symmetric & skew symmetric matrix 12. Properties of symmetric and skew matrix
	8	13. Adjoint of a square matrix 14. Properties of adjoint 15. Inverse of a matrix (reciprocal matrix) 16. Properties of inverse 17. System of equation & criterion for consistency *18. Finding inverse using elementary row operation