Course Planner for ENTHUSE Batch (Class 12th Student)

PHYSICS COURSE SCHEDULE

JEE Yearlong Physics for Class 12th of JEE Main and Advanced 2021 by MK Sir

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
Geometric optics	1	Introduction, Laws of reflection, Problems based on laws of reflection
	2	Problems based on relation between velocity of object and image
	3	Number of images with by combination of two plane mirrors
	4	Reflection through curve surface and Focal length of mirror
	5	Problems based on ray diagram and Mirror formula, Examples on spherical mirror
	6	Velocity of image and magnification
	7	Combination of spherical/plane mirror
	8	Refraction at plane surface, Slab and composite slab
	9	Problems based on apparent depth and height, Problems of apparent shift
	10	Total internal reflection. Problems based on TIR
	11	Prism – Deviation Formula
	12	Prism – Graph Between i and delta
	13	Special cases of prism
	14	Refraction at spherical surface
	15	Problems based on curved surface refraction
	16	Thin lens and lens formula
	17	Problems based on ray diagrams of lens
	18	Problems based on calculations with the help of lens formula
	19	Magnification, velocity of image
	20	Combination of lenses, lens-mirror combination
	21	Dispersion of light
	22	Dispersion without deviation
	23	Optical Instruments - I
	24	Optical Instruments - II
	25	Displacement method
Wave optics	1	Introduction of Interference of light
	2	Wave front YDSE Exp.
	3	YDSE oblique incidence
	4	YDSE after insertion of thin sheet
	5	Thin film interference
	6	Proof of Reflection and refraction by Huygens principal
	7	Discussion
	1	Electric Charge, Coulomb's Law
	2	Electrostatic Equilibrium
	3	Electric field & its significance
	4	Motion of charge particle in uniform electric field
	5	Electric field due to a point charge, ring & disc / graphs of point charge E
	6	Electric field due to a line charge & sheet
	7	Electric Lines of Forces and Gauss Law
	8	Application of Gauss Law 1. Point charge 2. Spherical symmetry 3. Line symmetry 4. Sheet 5. Cavity 6. Variable density 7. Amount of charge in variable E

Electrostatics	9	Electric Field and Potential relation (definition of electric potential)
	10	Potential due to a point charge, potential difference
	11	Electric field due to variable charge density in solid sphere
	12	Electric potential due to ring and disc.
	13	Electric potential due to hollow and solid sphere
	14	Potential energy of a system of point charge.
	15	Problems based on conservation of PE (definition of PE)
	16	Self-Energy of shell
	17	Self-Energy of Solid Shere
	18	Electric Dipole Concept, Electric Dipole Moment
	19	Electric Dipole 1.Electric Field 2. Potential
	20	Electric Dipole and point charge interaction, Electric – dipole dipole interaction
	21	Electric Dipole in Electric Field 1. Torque and potential energy
	22	SHM of electric dipole and energy and energy based problems of dipole in E
	23	Conductor - Theory
	24	Conductor Earthing
	25	Conductor – Cavity based problems
Gravitation	1	Newton's law of gravitation
	2	Gravitation field intensity
	3	Gravitation Potential and G.P. Energy
	4	Variation of g
	5	Kepler's Law 1. Orbital velocity 2. Escape veolcity
	6	Geostationary satellites and 2 star system
Current Electricity	1	Current, Current density
	2	Microscopic analysis
	3	Drift velocity related questions, current density, E=pJ
	4	Resistance 1. Cylinder 2. Spherical 3. Conical etc
	5	Combination of resistances 1. Series 2. Parallel 3. Mixed
	6	Infinite Series
	7	Dependence of Resistance and Resistivity on Temperature
	8	Electric power & Battery
	9	Relative Potential
	10	KCL and KVL
	11	Circuit based problem
	12	Combination of batteries
	13	Galvanometer 1. Ammeter 2. Voltmeter
	14	Wheat Stone's bridge
	15	Meter Bridge + PO Box
	1	Capacitance of isolated Conductor & sharing of charges
	2	Capacitor & circuits problems (Energy)

Capacitance	3	Capacitor & circuits problems (Steady State)	
	4	Combination of capacitors	
	5	R-C Circuit	
	6	Dielectric Theory	
	7	Problems on dielectric	
	8	Paralle Plate Capacitors	
	9	Energy Loss, force between plates	
	10	Spherical Capacitor	
	11	Cylindrical Capacitor	
	12	Discussion of capacitance	
Magnetism	1	Magnet + EMF due to moving point charge	
	2	Bio Savart's law , B. due to straight wire,	
	3	B. due to straight wire,	
	4	B. due to arc, ring	
	5	B due to solenoid, ampere's law	
	6	Magnetic force on a moving point charge	
	7	Circular path	
	8	Circular path, Helical path	
	9	Motion of charge E&B	
	10	Magnetic force on a current, Carrying wire	
	11	Magnetic torque on a closed, Current carrying loop	
	12	Earth magnetism, Magnetic Properties of matter	
	13	Earth magnetism, Magnetic Properties of matter	
	14	Discusion	
Emi	1	Magnetic flux & Faraday's law , Lenz's law	
	2	Examples on Faraday's law	
	3	Motional EMF	
	4	Motional EMF & Circuit problem	
	5	Circuit problem with mechanics	
	6	Time varying magnetic field	
	7	Self inductance	
	8	L–R series growth circuit	
	9	Problem on L-R circuit	
	10	Mutual Inductance, LC– Oscillation	
	11	sheet discussion	
Alternating current	1	AC definitions, R, L, C Circuit	
	2	R-L, L-C, L-C-R circuits	
	3	Resonance	
	4	Electric motor and generator, Transformer	
	5	Discussion	
	6	Discussion	
	7	Buffer	
	8	Buffer	
	9	Buffer	
	10	Buffer	
Modern physics	1	Photo electric effect, Exp. & observation	
	2	Photo electric effect Exp. & observation, Davission-germer Experiment	
	3	Photo electric effect, Exp. & observation	
	4	Davission-Germer Experiment	
	5	Radiation force and pressure Matter waves	
	6	Bohr model , Calculation of radius, velocity & Energy	
	7	Bohr model (Spectrum), Nucleus motion	
	8	Atomic collision	

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
	9	X- rays
	10	X- rays & Discussion of sheet
Nuclear physics	1	Nuclear, Mass defect , Binding Energy
	2	Radioactivity
	3	alpha decay, K Capture
	4	Statical law of radioactivity
	5	Fission & Fusion, Nuclear reactor
	6	Discussion
Semicondutor	1	Electrical conduction in semiconductor and energy band theory, Intrinsic and extrinsic semiconductors
	2	p-n junction diode & V-I characteristics ,Zener diode , photo diode
	3	Transistors, (NPN, PNP)
	4	Common emitter, Common base, Common collector.
	5	Digital electronics and Logic Gates
	6	Discussion
Em wave	1	Communication channels, Space communication, Remote sensing, Line communication
	2	Optical communication, Optical fibre.
	3	Electromagnetic Waves
	4	Buffer
	5	Buffer
	6	Buffer
	7	Buffer
	8	Buffer
	9	Buffer
Error	1	Vernier callipers ,screw gauge, serle's experiment
	2	Vernier callipers ,screw gauge, serle's experiment
	3	Discussion
Heat transfer	1	Conduction, Steady state, Thermal Resistance
	2	Combination of slabs, Radiation, Stefan's law
	3	Newton's law of cooling, Wien's displacement law, Stephen boltzman law and solar constant
	4	Discussion of heat transfer

JEE Yearlong Physics for Class 12th of JEE Main and Advanced 2021 by MS Sir		
CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
ELECTROSTATICS	1	Charge - Defination and its properties , Charging Method , gold Leaf electroscope
	2	Coulambs law , Effect of Medium , Electric Field .
	3	Electreic field Lines , and Electric field , Properties of electric field
	4	Electric Field Due to point charge , arc , ring , line charge, disc , sheet, E-x Graph
	5	Motion of Charge particle in Electric field , Defination of Flux
	6	Guass Law , Flux by Guass law .
	7	Electric Field Due to spherical shell , sphere , cylindrical shell , cylinder , thick sheet
	8	Electric Field Within Cavity , Electric field for Variable Charge density
	9	Cond. , charge and Electric Field within Conductor , charge distribution on concentric metaalic Shells and Parallel metallic plate .
	10	Potential Energy for two and multiple charge system , energy of system and its conservation
	11	Electric Potential and Potential Difference , Relation between Electric Field and potential difference
	12	Electric Potential of Point Charge , ring , line charge , spherical shell , solid sphere , Relation between potential difference and Word Done .
	13	Equipotential Surface , charge sharing and earthing of conductor ,

	14	Self energy of spherical shell , sphere , energy density of electric field .
	15	electric dipole , dipole moment
	16	electric potential and electric field due to electric dipole
	17	dipole in electric field , torque, energy force , force on dipole .
	18	SHM of Dipole , point charge , dipole , dipole -dipole interaction
	19	Properties of Conductor ,electrostatic pressure , Free BoundCharges , Conductor as equipotential surface , VANDE-GRAFF generator
	20	Shielding in conductor
	21	Di-electric and electric Polarization
	22	Discussion
	23	Discussion
	24	Discussion
	25	Discussion
GRAVITATION	1	Gravitational Force Field , Potential , Potential energy and comparison with electrostatic .
	2	Defination of ' g ' and its variation with with height , depth , rotation and shape
	3	Binding energy , escape velocity ,Bound System , Circular Orbits
	4	Keplers law , Geo- Stationary and Near Earth Satellite .
	5	Long pendulum , SHM if particle in tunnel , double star
	6	Discussion
CAPACITORS	1	Defination and equation of capacitor , capacitance , type of capacitor
	2	capacitance of spherical , cylinder , parallel plate and other capacitor
	3	Parallel plate - Equal and unequal charge case , steady state , charging
	4	Energy of capacitor , force between plates , combinsation of capacitor and charge sharing / Distribution in capacitor .
	5	Heat loss in circuit between steady state .
	6	dielectric partial and complete , polarization , induced charges , Equivalent Capacitance
	7	Heat loss and force of dielectric . Effect of charge in Capacitance
	8	Charing and discharging of capacitor , their equivalent and Equivalent time and battery efficiency
	9	More examples on Capacitance circuit questions , spherical capacitor , Earthing cases .
	10	Discussion
CURRENT ELECTRICITY	1	Defination of Current , Drift Velocity ,mobility and relation between Current and drift velocity .
	2	Current density , Ohm's law , Conductivity conductance , ohmic /non ohmic resistance
	3	Resistance in different cases , Defination of Equivalent Resistance , Variation of Resistivty and Conductance with tempeture , Semiconductor and thermistors .
	4	Ideal battery , EMF , Equivalent of Circuit elements ,Kirchoff's law
	5	Series and parallel combination of resistance and batteries .
	6	Wheat stone bridge , infinite series , symmetry , PT. Potential ,Nodal analysis
	7	More examples on finding equivalent resistance and Resistance for Cubical frame .
	8	Unbalanced wheatstone bridge , symmetric and non symmetric combinations
	9	Power of resistance , battery , parallel connection in home
	10	Max. Power Transfer theorm (MPTT) and examples of Power
	11	Fuse wire , Galvanometer , ammeter , Voltmeter and their Conversion
	12	Discussion and questions on Ammeter and Voltmeter
	13	Meterbridge and Discussion
	14	Potentiometer and Application
	15	Potentiometer and Application
	16	PO Box and Carbon Coding of resistance
	17	Discussion
	18	Discussion
	1	Production of Magnetic Field , Biot Savart law , magnetic Field Lines

MAGNETIC EFFECT OF CURRENT	2	Magnetic Field Due to St. Wire , Loop ,Arc , sheet
	3	Magnetic field due to Cylinder trough , solenoid
	4	More on Magnetic Field Lines , Magnetic Field Due to Moving Charge , E/B Value .
	5	Ampere's law , Finding Line Integration of magnetic field .
	6	Magnetic Field inside and Outside wires ,Magnetic Field Within Cavity
	7	Magnetic field between sheets , solenoid , Toroid .
	8	Discussion
	9	Magnetic Force , Motion in Uniform magnetic field
	10	Circular and Helical Motion
	11	Lorentz Force , Motion under Electric field and Magnetic field , energy discussion
	12	Velocity Selector ,mass spectrometer , force on wire
	13	Effective length in uniform Magnetic field , Force Between parallel wires , Magnetic dipoles , field Lines
	14	Dipole moment ,M of moving charge , field on dipole .
	15	Torque , energy and force on dipole due to Magnetic field , Dipole -Dipole
	16	MCG ,Current /Voltage Sensitivity ,Discussion
	17	Discussion
MAGNETISM	1	Earth magnetism , Meridian , Dip angle , dip circle , app. Dip
	2	Vibrational Magnetometer , Mag. Shielding ,Meissener effect
	3	Magnetic material and Microscopic explanation
	4	Magnetization variable , Curie law , curie-weiss law , Curie temp .
	5	Hysterises , B Vs H Graph , coercivity , retentivity , Losses
	6	Discussion
EMI	1	Translational and Rotational of conducting rod in uniform Magnetic field
	2	Accelarating and rotating conducting rod in absense of Magentic field , Magnetic Flux and Faraday Law and Lenz law
	3	Induced Current , Understanding E , Circuit diagram
	4	Energy Loss , In-out of Magnetic field by a closed body
	5	Horizontal - Vertical Rails
	6	Cases including C , terminal velocity , rotating disc
	7	Cases having Induced EMF and Battery
	8	Disc Rotation about diameter , AC generator
	9	time variation of Mangetic field , Induced EMF inside outside
	10	Finding Potential difference and Induced EMF b/w points , charges flow , impluse
	11	questions on Magnetic field Variation and Discussion
	12	Disccusion
	13	Mutual Induction Law , Conentric Coils , Co-axial Solenoid .
	14	More example on Mutual , Self induction Law , Inductor
	15	Inductance , equivalent Inductance of solenoid , toroid , Inductor Combination
	16	Ex. Of inductor , Magnetic Energy Density , Growth /fall of current in LR Circuit
	17	Examples of LR Circuit
	18	L-C Oscillations , Equivalent time calculation ,comparision with spring - block
	19	Discussion
	20	Discussion
AC	1	AC Current , Frequency , avg, ,RMS ,peak .AC Circuit , Phase angle , Power and power factor
	2	Phasor diagram , resistance , X ,Z , rms value of V and Instantneous value of V across elements .
	3	Fundamental AC Circuit , R only, L only , C only . Series Circuit : R-L ,L-C , R-C , L-C-R Circuit
	4	resonance and Circuit analysis , examples
	5	Quality factor ,half power frequency , Discussion
	6	Parallel AC Circuit , Conductance , Susceptance and admittance
	7	Choke Coil , Transformer .
	8	Disccusion

DAMPING	1	Natural Damped oscillation ,underdamping , critical damping & over damping
	2	Under- damping - A variation , Q Value , Power Loss , Log decrement
	3	Forced damped oscillation , resonance
	4	Discussion
EM WAVES	1	Maxwell's Displacement current and Ampere's law failure
	2	Maxwell Equation ,EM waves and hertz Experiment
	3	wave Eqn , Poynting vecor , EM Energy Density
	4	momentum transfer , Specturm of EM Waves Discussion
	5	Discussion
GEOMETRICAL OPTICS	1	Introduction to ray optics , rectilinear propogation and bending ,reflection & Refraction
	2	Reflection ,Laws of reflection vector Law , Plane mirror , Object and image
	3	Plane mirror deviation , Field of View ,object - image velocity, no. of images
	4	Spherical Mirror - Concave /convex , focal length , mirror formula , newtons formula
	5	object - image speed , u-v Graph , focus (experimentally) Parallax .
	6	discussion
	7	Refraction ,Law of Rrefraction , Vector Law , Refractive index , Refraction in multiple parallel mediums , equations of Ray .
	8	Rectangular Slab , lateral shift , normal location in different medium , velocity in different medium .
	9	shifting by slab , TIR and critical angle , Graph b/w deviation and angle of incidence .
	10	Circle of illuminance, optical fibre , Mirage , Looming .
	11	Discussion , Prism , graph b/w deviation and angle of incidence .
	12	No emergence prism , i'=0 , small angled prism
	13	Cauchy 's Formula , Dispersion , Dispersive Power , Prism Combination , achromatism .
	14	Discussion , Spherical refraction , formula F1 and F2 .
	15	Spherical Refraction examples , Lens Formula , Magnification
	16	Cases for Lenses , obj-image Velocity , cutting -splitting
	17	Lens Combination , power ,silvering of lens.
	18	Displacement Method , lens Defect , Achromatic combination
	19 + 20	discussion
OPTICAL INSTRUMENTS AND EYE DEFECTS	1	Obj. Size , Simple Microscope , Magifying power
	2	Compound Microscope - Magnification power and length of tube .
	3	Astronomical telescope - Magnification power and length of tube .
	4	Resolving power and comparision ,lens cameras and Focal length , eye defects , myopia , hypermetropia , presbyopia , astigmatism
	5	Discussion
WAVE OPTICS	1	Huygens hypothesis , wave front , secondary wavelets , laws of reflection /refraction , failure .
	2	Coherent sources and YDSE , Intensity
	3	Variation on screen , no. of maxima & minima on screen .
	4	Optical path , slabs on slits
	5	bi and multi chromatic , white light .
	6	Medium change , screen movement , Multi slits
	7	shape of fringes , lloyd's Mirror
	8	Thin Film interference , Newtons Ring
	9	Polarization , polaroid , malus and Brewster Law , Scattering
	10	Diffraction , fresnel/Fraunhofer diffraction , slit/Circular Hole , resolution
	11	Discussion
	12	Discussion
PHOTON THEORY ,MATTER WAVE	1	Photon , Power ,intensity , force on beam .
	2	Examples of force on beam
	3	De-broglie wavelemgth , matter waves , quantization , particle in a box , bohr Model
	4	Quantization examples , discussion

,PHOTO-ELECTRIC EFFECT	5	Photo - electric effect , hertz , hallwachs , einstein explannation
	6	Isolated sphere and PEE Experiment ,stopping potential
	7	I-V Graph and effect of intensity and frequency
	8	Discussion
ATOMIC STRUCTURE AND X RAYS	1	different models of Atom , Bohr Model and equations
	2	V, r ,E dependancy on n and Z . Modified Bohr Model
	3	Excitation - De- excitation energy levels , seriues , rydberg equation .
	4	Recoil and Series Energy , atomic Collision
	5	Atomic Collision Example
	6	Motion of nucleus ,failure of Bohr model , discussion
	7	Discussion
	8	X Rays
	9	X rays
	10	Discussion
NUCLEAR PHYSICS AND RADIOACTIVITY	1	Nucleons , Representation of neucleus , Nuclear Radius , amu , rest mass energy
	2	Isotope , isotone , isobar , binding energy and mass defect
	3	Nuclear Forces , BE/A , Stability , Fission ,Fusion
	4	Behaviour , of BE/A Graph ,volume , surface and potential energy
	5	Nuclear reaction , Q value , Nuclear Decays , alpha, beta, gamma comparison
	6	Alpha decay , beta decay , K capture , Gamma Decay
	7	Fission Reactors , Fast Breeders , Fusion ,Pair production and anhilation
	8	Discussion
	9	Alpha ,beta, gamma decay , activity , law of radioactivity , units
	10	Half Time ,Avg. Time , decay constant , soddy and Fajan's Rule Series
	11	Parallel disintegration , Eqivalent decay constant , Disintegration with product
	12	Discussion
ELECTRONIC DEVICES	1	Band theory , Forbidden gap , Concept of Holes in semi-conductor
	2	Intrinsic ,extrinsic ,doping , N type ,P type , Mass action law .
	3	P-N Junction ,diffusioin , drift current , potential barrier , deplection layer , Diode- Forward & Reversed Biased
	4	Zener and avalanche breakdown , application of diode LED ,photodiode ,solarcell ,Zener diode ,rectifier - Full wave , half wave ,Bridge recitifier
	5	Transistor , E,B,C, npn ,pnp . Region of Working
	6	Transistor circuits , Common base , Common emiiter Common colleter , input output charateristics
	7	Current Gain ,Voltage Gain and other relation . Questions , transistor as amplifier
	8	Discussion
	9 + 10	Logic gates : OR ,AND, NOT , NOR,NAND , XOR, XNOR Gate . Boolean algebra ,truth table , Elec. Analogue and Circuit diagram
	11	Discussion
COMMUNICATION SYSTEM	1	Communication and Element of Communication System , types , basic definitions tranducer , noise , signal ,attenuation
	2	Prop. Of EM waves , Ground ,Sky ,space Communication . Modulation : AM ,FM ,PM
	3	Modulation Index , Band Width Sq.law Device ,Band Pass Filter , Demodulation ,IP Stage , Envelope Detector , Cmax.
	4	Discussion

CHEMISTRY COURSE SCHEDULE

JEE Yearlong Physical & Inorganic Chemistry for Class 12th of JEE Main and Advanced 2021 by PS Sir

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
CHEMICAL KINETICS (3.5 WEEKS)	1	introduction,rate of reaction,rate of appearance & disappearance, Differential rate law, rate in terms of pressure
	2	rate law or rate expression,elementary & complex reaction,order & molecularity, Determination of rate law for complex reactions
	3	significance of order of reaction,experimental determination of order of reaction,unit of rate constant
	4	integrated rate equation for zero order reactions,characteristics of zero order reaction & Illustrations
	5	first order reaction,characteristics of first order reactions
	6	Illustrations on first order reactions, secound order reaction, nth order reaction
	7	monituring of first reaction in terms of pressure & Illustrations
	8	monitoring the progress of reaction by measuring volume of gases evolved,by measuring volume of alkali used,by measuring angle of rotation
	9	rate in terms of angle of rotation,rate in terms of thickness of oxide film,pseudo first order reactions
	10	Parallel first order reactions,Numerical based on parallel first order reaction
	11	kinetics of reversible first order reaction, kinetics of series first order reaction
	12	collision theory & its application
	14	arrhenius equation & numericals based on it, temperature coefficient
	15	maxwell's speed distribution curve, variation of equilibrium constent with temperature, factors affecting rate of reaction
	16	effecting of catalyst on reaction rate, reaction mechanism, energy diagram for coplex reaction, writing rate law for complex reaction, steady state approximation, miscelleneous numericals
RADIOACTIVITY(2 WEEKS)	1	radioactive emissions & their nature calculation of alpha,beta & gamma particles, group displacement law
	2	kinetic of radioactivity, activity & its units, numerical problems
	3	carbon dating, uranium dating, estimation of value of blood
	4	series & parellel decay, stability of nucleus, cause of radioactivity
	5	K-electron,γ-emission,artificial radioactivity,stability of nucleus,binding energy
	6	Nuclear fission:-atomic bomb,nuclear reactor,nuclear fussion
THERMODYNAMICS (4 WEEKS)	1	Basic terms used in thermodynamics system,surrounding,boundary or wall,extensive & intensive properties, State & Path functions
	2	Heat capacities, Molar heat capacity(Cv & Cp),degree of freedom for monoatomic,diatomic,triatomic gas
	3	Law of Equipartition of energy,internal energy(for ideal gas & solid and liquid)
	4	internal energy for real gases, heat and work, Zeroth law of T.D., First Law Of T.D.
	5	Applications of first law , Enthalpy function
	6	relation between delta H & delta U, Applications & Illustrations
	7	reversible and irreversible processes,comparision of work done in reversible and irreversible processes
	8	thermodynamic processes,analysis of a)isobaric process b) isochoric process c) isothermal process
	9	reversible and irreversible adiabatic process,comparision of final temparature in reversible and irreversible adiabatic,comparision of isothermal & adiabatic process
	10	free expansion,cyclic process,polytropic process, Kirchoff's law
	11	limitations of first law of thermodynamics, spontaneous and non-spontaneous process, cornot cycle and its efficiency

	12	entropy and its siginificance,mathematical defination of entropy,condition for spontaniety,statements of 2nd law
	13	calculation of entropy of system,surrounding and total entropy for isochoric process,isobaric process,isothermal process,adiabatic process
	14	calculation of entropy in free expansion,entropy change for heating of solid,liquid & gas,entropy of reaction,third law of thermodynamics
	15	introduction of gibbs function,criteria for spontaniety,physical significance of gibbs free energy
	16	variation of gibbs free energy with pressure and temparature,gibbs free energy and equilibrium constant
THERMOCHEMISTRY (2 WEEKS)	1	introduction,enthalpy of formation,enthalpy of combustion,Hess's law
	2	introduction,enthalpy of formation,calculation of enthalpy of reaction by enthalpy of formation,enthalpy of compustion
	3	enthalpy of neutrilisation and its calculation,lattice enthalpy & born haber cycle
	4	enthalpy of hydration,enthalpy of solution,enthalpy of atomisation & other enthalpies
	5	calorimetry, adiabatic flame temperature
	6	bond energy, bond dissociation energy, resonance energy
ELECTROCHEMISTRY (4.5 WEEKS)	1	introduction,type of electrochemical cells,galvenic cell & its working,functions of salt bridge
	2	properties of inert electrolyte,effect of external battery on galvenic cell,representation of cell, writing the cell reaction
	3	electrode potential,EMF of cell,standard hydrogen electrode,measurement of standard electrode potential,significance of standard electrode potential
	4	electrochemical series,ΔG & Ecell,nernst equation,using nernst equation on a complete cell
	5	application of nernst equation for a half cell, different types of half-cells and their application in numericals
	6	Concentration cells and their application
	7	electrode gas concentration cell,metal sparingly soluble salt-anion electrode and its application
	8	questions based on molted electrode,when 2 or more half cell reactions are combined to form a new half cell reaction,thermodynamics of cell
	9	electrolysis & electric cell,product of electrolysis
	10	products of electrolysis of NACL,HCL,H2SO4,CUSO4,important points to remember for electrolysis
	11	quantitative analysis of electrolysis and faradays first law
	12	faraday's law of electrolysis,classification of conductors
	13	"introduction to conductivity cell and importents terms (conductence,conductivity and molar conductivity)"
	14	equivalent conductivity, variation of conductivity and molar conductivity with dilution
	15	variation of molar conductivity with dilution (for strong and weak electrolyte) , kohlransh's law and ostwald's dilution law
	16	calculation of degree of dissociation of weak electrolyte,calculation of solubility product of sparingly soluble salt
	17	ionic mobility,conductometric titration(titration of SA vs SB,titration of WA vs Sb)
	18	conductometric titrations,precipitation titration,types of batteries
	1	Defination of solution,vapour pressure of a liquid:evaporation & condensation,variation of vapour pressure with temperature,boiling point
	2	Raoult's law, vapor pressure of an ideal binary solution containing and volatile liquid
	3	"liquid and vapor composition curve for ideal solution, variation of composition of liquid and vapors with external pressure"
	4	illustration of variation of composition of liquid and vapour with externel pressure,principle of isobasic and isothermal disticlation

LIQUID SOLUTION (3 WEEKS)	5	vapor pressure composition curve,boiling point composition curve,illustrations solved in class,vapor pressuse of two immisible liquids (Nalatile)
	6	ideal and non-ideal solution, ilustration on identification & characteristics of ideal and non-ideal solution
	7	"azeotropic mixture,their types and properties,colligative properties, relative lowering in vepper pressure"
	8	elevation in boiling point,experimental determination of rcvp,illustrations on colligative properties(rlvp)
	9	illustration on elevation in bothing point, depression in freezing point
	10	illustration based on depression in freezing point, osmotic pressure & osmosis
	11	illustration of osmotic pressure,van't hoff factor
	12	good illustration on van't hoff factor,solubility of gases in liquids,henry law,raoult's law as a special case of henry's law
SURFACE CHEMISTRY (2 WEEKS)	1	#adsorbtion and absortion, # nechanism and thermodynamics of adsorbtion, # types of adsorbtion
	2	adsorption isotherm(frendlich isotherm,langmiar's isotherm),adsorption from solution,catalysis (types of catalysis),promotors and poison
	3	theory of catalyst, characteristics of catalyst, enzymes, charactersitics of enzymes
	4	colloidal solution,classification of colloids(based on size of particle,based on physical state of dispersion medium and dispersed phase),micelles,classification based on ineraction of dispersed phase and dispersion medium
	5	prepration of colloids,dispersion method & condenstion method,properties of colloid
	6	properties of colloid:-charge on colloid,tyndall effect,color of a colloid,brownian movement
	7	#coagulation, methods of coagulation #purification of colloid's #emulsion's & test of emulsion's
SOLID STATE(3 WEEKS)	1	introduction,amorphous & crystalline solids,types of crystalline solids,crystal lattice & unit cell,types of unit cell & bravias lattices
	2	analysis of unit cells,simple cubic unit cell,BCC unit cell & FCC unit cell
	3	Density of unit cell and its calculation, Calculation of formulaes , Illustrations
	4	Close packing of atoms,Square & hexagonal close packing , tetrahedral voids & octahedral voids
	5	HCP & CCP stuctures and their formation, location of octahedral & tetrahedral voids
	6	limiting radius ratio & its calculation, questions based on radius ratio rule
	7	Structure of Ionic Compounds,NaCl l & CsCl type, zinc blende structure,wurtzite structure,fluorite and antifluorite structure
	8	Defects in solids, Stochiometric defects (schottky & frenkel defects), Non-stoichiometric defects
	9	Magnetic properties of materials, Piezoelectricity, Pyroelectricty , Bragg's Equation
Co-ordination Compounds(3.5 weeks)	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, Sigdwick's EAN Rule
	5	Nomenclature Of Coordination compounds, Naming of bridging complexes,werner's coordination theory
	6	valence bond theory(VBT),assumptions of VBT and Important Aspects,Complexes with CN=4, complexes with CN=6 and 5,Limitations of VBT
	7	crystal field theory,crystal field splitting in octahedral field,filling of electrons in octahedral complexes
	8	cystal field splitting in tetrahedral and square planar field,comparision of CFSE,factors affecting CFSE

	9	stability of complex compounds,color of complex compounds,charge transfer spectra
	10	jahn-teller distortion(tetragonal distortion),stability of complexes
	11	isomerism in coordination compounds,structural isomerism,stereoisomerism
	12	isomerism in octahederal complexes
	14	Applications Of Coordination Compounds
		one extra discussion lecture to be covered on upcoming Sunday after completion of chapter
P-Block(3.5 weeks)	1	Introduction, General Properties of P-Block Elements, Inert Pair Effect, Anamolous Behaviour of First Member of Group
	2	Boron Family, Compounds of Boron, Borax, Baric 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 Stablity, 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, Sulphoric Acid, Oxoacids of Sulphur
	12	Halogen Family & their Compounds
	13	Noble Gases & their Components, Uses of Noble Gases
D-BLOCK & F_BLOCK ELEMENTS(3 weeks)	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 Permagnet, Potassium Dichromate
	4	Chromyl Chloride Test, Compounds of Zn , Compounds of Ag
	5	Compounds of Copper, Compounds of Iron
METALLURGY(2 weeks)	1	Introduction, Method for Metallurgical Extraction, Concentration, Gravity Separation, Magnetic Separation
	2	Forth Floatation, Calcination, & Rousting 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, Reducing Character Of Carbon & CO
	6	Metallurgy of Copper (Cu)
	7	Extraction of Aluminium
	8	Metallurgy of silver & Gold
Salt Analysis(2 weeks)	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 Physical & Inorganic Chemistry for Class 12th of JEE Main and Advanced 2021 by JH Sir		
CHAPTER NAME	**NO. OF LECTURES**	**CONTENT OF CHAPTER**
Solid State-9	1	Introduction, Basic definition, Unit cell / Bravais lattices
	2	Cubic unit cell, Various solved Examples
	3	Packing in solids
	4	Octahedral & Tetrahedral void
	5	Radius Ratio, Packing in ionic solids

	6	NaCl / ZnS / CsCl structure, Na2O / CaF2 structure
	7	Defects
	8	Electrical & Magnetic properties
	9	Discussion
Liquid Solution-7	1	Introduction, Vapour pressure
	2	Rault's Law
	3	Colligative properties,ΔTb, ΔTf
	4	Osmotic pressure, Abnormal colligative properties
	5	Non-ideal solution, Distillation / Azeotrope
	6	Henry's law
	7	Discussion
Kinetics -12	1	Introduction, Rate of reaction
	2	Rate law, Zero order
	3	1st order
	4	2nd order, nth order
	5	Exp. determination of order of reaction, Calculation of 1st order rate constant
	6	Kinetics of parallel reaction, Kinetics of reversible reaction
	7	Kinetics of sequential reaction
	8	Reaction mechanism, Steady state and equilibrium approach
	9	Arrhenius Equation
	10	Collision theory of reaction
	11	Activated comlplex theory
	12	Discussion
Radioactivity-4	1	Theories for nuclear stability
	2	Radioactive disintegration series, Radioactive disintegration law, Radioactive Decay
	3	Rock dating, Carbon dating,
	4	Nuclear reaction,Discussion
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
Thermochemistry -7	1	Introduction, Exothermic & Endothermic reaction
	2	$\Delta H= \Delta U+\Delta n.RT$, Kirchoff's Equation
	3	Enthalpy of reaction, factors affecting ΔH
	4	Enthalpy of combustion, Formulation, Bond Enthalpy, Resonance energy
	5	Enthalpy of sublimation, Enthalpy of atomisation, Ionisation enthalpy, Electron gain enthalpy, Lattice enthalpy, Born-Haber Cycle
	6	Enthalpy of hydration, Enthalpy of solution, Enthalpy of dilution, Enthalpy of Neutralisation
	7	Discussion
Thermodynamics (II) - 7	1	Carnot cycle, Second law of P.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
	1	Classification, Arrhenius theory of dissociation, Dissociation of H2O, 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

IONIC EQUILIBRIUM-11	4	Salt hydrolysis, Amphiprotic salt
	5	Buffer solution, Change in pH of Buffer, Buffer index
	7	Indicators, Double indicator acid base titration
	8	Solubility product
	9	Effect of complex formation on solubility, Effect of hydrolysis on solubility
	10	Precipitation
	11	Discussion
Electrochemistry-12	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
	4	Various Solved Examples
	5	Primary cell / secondary cell
	6	Electrolytic cell, Faraday's law
	7	Various Solved Examples
	8	Sequence of deposition
	9	Conductance / Conductivity, Molar conductance
	10	Kohlraush law
	11	Conductometric titration, Ionic mobility
	12	Discussion
Surface Chemistry-6	1	Adsorption
	2	Catalyst
	3	Colloidal solution Classification
	4	Preparation & Properties of Colloids
	5	Emulsion
	6	Discussion
Co-ordination Compounds-15	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, Sigdwick's EAN Rule
	5	Nomenclature Of Coordination compounds, Naming of bridging complexes,werner's coordination theory
	6	valence bond theory(VBT),assumptions of VBT and Important Aspects,Complexes with CN=4, complexes with CN=6 and 5,Limitations of VBT
	7	crystal field theory,crystal field splitting in octahedral field,filling of electrons in octahedral complexes
	8	cystal field splitting in tetrahedral and square planar field,comparision of CFSE,factors affecting CFSE
	9	stability of complex compounds,color of complex compounds,charge transfer spectra
	10	jahn-teller distortion(tetragonal distortion),stability of complexes
	11	isomerism in coordination compounds,structural isomerism,stereoisomerism
	12	isomerism in octahederal complexes
	14	Applications Of Coordination Compounds

	15	Discussion
Metallurgy-8	1	Introduction, Method for Metallurgical Extraction, Concentration, Gravity Separation, Magnetic Separation
	2	Forth Floatation, Calcination, & Rousting 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, Reducing Character Of Carbon & CO
	6	Metallurgy of Copper (Cu)
	7	Extraction of Aluminium
	8	Metallurgy of silver & Gold
p-block-13	1	Introduction, General Properties of P-Block Elements, Inert Pair Effect, Anamolous Behaviour of First Member of Group
	2	Boron Family, Compounds of Boron, Borax, Baric 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 Stablity, Oxides of Nitrogen, Compounds of Nitrogen
	7	Compounds of Nitrogen, N2- uses of N2, NH3 - 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(PH3), Acids of Phosphorus, Halides of Phosphorus
	10	Oxygen Family, Physical Properties Compounds of 16th Group, 1.Dioxygen(O2), 2. Ozone (O3)
	11	Sulphur & its Allotropes, Sulphur Dioxide, Sulphur Trioxide, Sulphoric Acid, Oxoacids of Sulphur
	12	Halogen Family & their Compounds
	13	Noble Gases & their Components, Uses of Noble Gases
	1	Introduction,Physical Properties of d-block Elements
	2	Trend in SRP Values, Stability of Higher Oxidation States, Color of Ions

CHAPTER NAME		CONTENT OF CHAPTER
d-block & f-block Element-5	3	Catalytic Properties, Some Important Compound of D-block, Potassium Permagnet, Potassium Dichromate
	4	Chromyl Chloride Test, Compounds of Zn , Compounds of Ag
	5	Compounds of Copper, Compounds of Iron
Salt 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 NO3-, 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 12th of JEE Main and Advanced 2021 by SY Sir

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
Stereoisomerism (19)		**(a)Geommetrical isomerism (4)**
	1	Difference between structural & stereoisomerism, Introduction of geommetrical isomerism
	2	Condition of gemmetrical isomerism
	3	Naming of G.I. (cis-trans, E-Z, syn-anti)
	4	Properties of G.Isomers, Calaulation of G.Is.
		(b)Conformational Analysis(4)
	5	Basic ideas Infarmation for conformational analysis
	6	Comformations in acylic compounds.
	7	Conformations in acydic + cyclic compounds
	8	Conformations in acydic compounds
		(c)Optical isomerism (10)
	9	Introduction, variation af q, chiral atom.
	10	Elements of symmetry (plane, centre)
	11	Elements of symmetry (AAOS, AOS)
	12	Condition for Optical activity
	13	Methods of representation of diff molecule and their Intercanversion
	14	Configuration of compound (D/L- and R/S)
	15	Optical isomerism in compound with one and two chiral centre
	16	Meso compound, Enantiomers, Diastereomers, Racemic mixture
	17	Resolution, optical purity, Enantiomeric excess,
	18	Calculation, stereoisomers
	19	Disscusion
		Reaction reagents (2)
	1	Electrophile, nucleophile
	2	Variation of Electrophilicity and nucleophilicity
		Carbocation (2)
	3	General, Generation
	4	General reaction. And its rearrangements
		Important Reaction Involving carbocation (R-X, form + Rxn) (8)
	5	Addition of HX, and H_3O^+ addition with alkenes / alkynes,
	6	Addition of X_2, IX, NOX,, HO-X with alkenes / alkynes,

	7	Addition of X_2, IX, NOX,, HO-X with alkenes / alkynes,
	9	OMDM, HBO
	10	Dehydration of alcohol (E_1-Reaction)
	11	Pinacol-Pinacolone rearrangement
	12	Demjanav rearransement, Dienone Phenol
		Nucleophilic Substitution reaction (SN-RXN)(5)
Halogen Derivatives (28)	14	SN^1 & SN^2
	15	Comparison of SN^1 & SN^2
	16	SN_i
	17	Examples of SN reactions of R-X, R-OH, R-O-R
	18	Examples of SN reactions of R-X, R-OH, R-O-R + SNNGP
		Elimination Reoction (5)
	19	E_1, E_2 , E_{1CB}
	20	E_1, E_2 , E_{1CB}
	21	Orientation of E.R
	22	Pyrrolylic / thermal elimination rxn
	23	Dehydration, Dehalogenation
		Free Radical (5)
	24	Introduction, G.M.P, GR
	25	Important reaction involving FR. (Kolbe, Electrolysis, wurtz reaction) and realted reactions
	26	Photohalogenation (chlorination, Bromination)
	27	Per-oxide effect, NBS RXn, Pinacol-form n
	28	Hunsdiecker reaction
		Grignard Reagent(3)
	1	Grignard reagent -1
	2	Grignard reagent -2
	3	Grignard reagent -3
		Reduction of various functional group (4-5)
	4	Reduction by H_2/cat
	5	Reduction by $LiAlH_4$
Alcohal and Ether (11-12)	6	Reduction by SBH, BH_3-THF/H^+, DiBAl-H
	7	Some important reduction
	8	Some important reduction
		Oxidation (4)
	9	Oxidation -1 (Alkane, alkene, alkyne)
	10	Oxidation -2 (Alkane, alkene, alkyne)
	11	Oxidation -3 (R-OH, R-X)
	12	Oxidation -4 (Aldetryde, ketone)
		Heating effect (2)
	1	Heating effect on various compound -(2)
	2	Heating effect on various compound -(2)
		Nucleophilic addition reaction (2)
	3	Reaction with $NaHSO_3$, HCN, H_2O, H_2N-Z
Carbonyl compounds (Aldehyde, ketone) (10)	4	Reaction with R-OH
		Name reactions (6)
	5	Haloform reaction
	6	Aldol condensation reaction
	7	cannizaro's reaction
	8	Claisen-sehmidt, perkin, reformalsky,
	9	Knoevengel, claisen-ester condensation, michael addition rxn
	10	Benzil-Benzilic acid rearrangement, benzoin, corey House synthesis
		Carboxylic acid derivatives (3)

Carboxylic acid derivatives and Amines(7)	1	G.M.P (general method of preparation)
	2	G.M.P (general method of preparation and reactions)
	3	General reactions
		Amines (4)
	4	General method of preparion
	5	Aldol condensation reaction and reactions
	6	Aldol condensation reaction and reactions
	7	Benzene diazonium chloride and its rxn
Hydrocarbon -2	1	Alkane, alkene
	2	Alkene, alkynes
Aromatic compound-12		**Benzene (5)**
	1	G.M.P. and its GR
	2	Activating deactivating effect, and directing effect of different groups towards ESR
	3	Orientation effect in monosubstituted aromatic compound and other aromatic compound towards ESR
	4	Different examples of ESR of Benzene
	5	Different examples of ESR of Benzene
		Phenos (3)
	6	G.M.P
	7	Rxn of Phenol
	8	Rxn of Phenol
		Aniline (3)
	9	G.M.P & GR
	10	G.M.P & GR
	11	Test of phenol and aniline, coupling reactions.
		Chlorobenzene (1)
	12	G.M.P & Rxn.
Biomolecule (9)		**Amino Acid & Proteins (2)**
	1	Introduction, classification, physical properties Isoelectroic point
	2	Reaction of Amino acid, protein and its classification
	3	Nucleic acid / Vitamines
		Carbohydrates (4)
	4	Introduction, classification
	5	Structure of monoseccharides (Glucose, fructose)
	6	Reactions of monosaccharides
	7	Disaccharides and polysoccharides
	8	Polymers
	9	Chemistry in every day life

MATHS COURSE SCHEDULE

JEE Yearlong Mathematics for Class 12th of JEE Main and Advanced 2021 by GB Sir & MS Sir

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
Log + Quadratic (10)	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
	7	Quadratic equation V/S Identity
	8	Condition of common roots
	9	Rational algebraic inequalities (Method of interval)
	10	Graphs of quadratic expressions, $y = ax^2 + bx + c$
	11	Explanation of above graphs
	12	Computing the maximum or minimum values of rational function
	13	Location of roots
	14	General and mixed problem
	15	Finding the condition for which a general two degree expression
	16	Theory of equations
	17	Log + Modulus
	18	Modulus Inequality
	19	Graph of Logarithm and Log Inequality
Trigonometric Ratio Identities + Trigonometric Equation-6	1	Trigonometric Equation & Inequation
	2	Formulas
	3	Solving Equations
	4	Discussion
Sot - 5	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
	6	Length of angle bisectors & median
	7	Orthocentre
	8	Distances between special points
	9	Solution of triangle (Ambiguous Case)
	10	Regular Polygon
	11	Cyclic Quadrilateral
Binomial theorem - 5	1	Binomial expression
	2	Binomial theorem
	3	General term
	4	Number of terms in expansion
	5	Middle term
	6	Numerically greatest term
	7	Applications of binomial theorem
	8	Properties of binomial coefficients
	9	Summation of series
	10	Miscellaneous problems on summation
	11	Multinomial theorem
	12	Multinomial theorem for negative and fractional index
	13	Approximation

Function-15	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
	6	Examples on Domain Range
	7	Equal or Identical Function
	8	Homogeneous Functions
	9	Bounded Function
	10	Implicit & Explicit Function
	11	Applications of functional rule
	12	Transformations of The graph
	13	Classification of Functions
	14	Composite of uniformly & non-uniformly defined Functions
	15	Inverse of A Function
	16	Odd & Even Functions
	17	Periodic Function
Inverse Trigonometric Function - 6	1	General introduction
	2	Domain, Range & Graph of Inverse trigonometric functions
	3	Properties of inverse trigonometric function (P1, P2 ……. P5)
	4	Properties of inverse trigonometric function (P6, P7)
	5	Simplification & Transformation of Inverse functions by elementary substitution and their graphs
	6	Equations involving inverse trigonometric functions
	7	Identities involving inverse trigonometric functions
	8	Simultaneous equations and inequations involving I.T.F.
	9	Summation of series
Limit - 10	1	General introduction
	2	Definition of limit
	3	Left hand limit and right hand limit of a function*
	4	Î - d Definition (A formal definition of limit)
	5	Indeterminate forms
	6	Five Fundamental Theorems
	7	Various Strategies (To evaluate limit)
	8	Sandwich / Squeeze play Theorem
	9	Limits of Trigonometric Functions
	10	Limit using Series Expansion
	11	Limit of Exponential Functions
	12	Limits of the function of the form 1¥
	13	Generalized Formula for 1¥
	14	limits of functions having built in limit with them
Continuity & Diff - 10	1	Explanation Of Continuity , Continuity at a point , Concept of LHL, RHL
	2	Questions based on theory of continuity , Built in Limit & Illustration , Important concepts to solve continuity
	3	Continuity in interval , Continuity at point function , Limit based continuity questions, Important points
	4	Important points about continuity , [f(x)] type questions
	5	Continuity of Composite function & illustration , [f(x)] type questions, Questions of Signum functions
	6	Methods to check differentiabilty & Differentiabilty by graph
	7	Reasons of Non Differentiability , Modulus based questions
	1	Differentiation of inverse function and mod function
	2	Modulus based & logarithmic differentiation

MOD - 5	3	Differentiation of parametric function,differentiation of implicit function
	4	Differentiation of infinite series,differentiation of one function w.r.t. another,differentiation of y1y2 base function
	5	Differentiation of determination,important question
Indefinite Integration - 20	1	Antiderivative
	2	Geometrical interpretation of indefinite integral
	3	Antiderivative or reverse phenonmenon of differentiating
	4	Properties of integration Basic Examples
	5	Integration by substitution
	6	Integration by parts
	7	Integrals of trigonometric function
	8	Integration of rational function
	9	Integration of irrational algebraic function
	10	Miscelleneous
	11	Reduction formula
	12	Some integrals which cannot be found in terms of known elementary functions
Definte Integration - 15	1	Definite integral as the limit of sum
	2	The fundamental theorem of calculus
	3	Geometrical Interpretation of Definite integral
	4	Evaluating definite integrals by finding antiderivatives
	5	Walli's theorem
	6	Properties of definite integral (P1, P2, P3, P4, P5, P6)
	7	Properties of definite integral (P7)
	8	Derivatives of antiderivatives (newton-leibnitz formula)
	9	Sum of series using definite integration
	10	Evaluating integrals dependent on a parameter
	11	Determination of function
	12	Estimation of definite integral and general inequality in integration
	13	Reduction formula
	14	Differentiating and integrating series
Differential Equation - 5	1	Definition
	2	Order and degree of differential equation
	3	Solving differential equation
	4	Formation of A differential Equation
	5	General and particular solutionsc
	6	Elementary types of first order & first degree differential equations
Area Under Curve - 7	1	Area under the curves (given by Cartesian equation)
	2	Area enclosed between two curves
	3	Standard areas
	4	Area under various cases
	5	Determination of unknown parameters
	6	Determination of unknown parameters 6. Concept of variable area (greatest and least value)
	7	Concept of variable area (greatest and least value)
Application of Derivative - 20	1	Tangent & Normal
	2	Monotonicity
	3	Maxima & Minima
	1	General introduction
	2	Application of distance formulae
	3	Co-ordinates of some particular points
	4	Area of a Triangle and condition for collinearity
	5	Equation of straight Linec
	6	Different forms of straight lines
	7	Position of a point w.r.t. a line

Straight Line + Circle - 8	8	Length of perpendicular
	9	Reflection of a point
	10	Internal angles of triangle
	11	Line inclined at an angle to other line(s)
	12	Condition for concurrency
	13	Family of straight line
	14	Transformation of axes
	15	Equation of Bisectors of angles between two lines
	16	Pair of Straight lines
	17	General equation of second degree representing a pair of straight lines
	18	Problems on locii
	19	Definition
	20	Diametrical form of circle
	21	Intercept (Made by the circle)
	22	Position of a point w.r.t a circle
	23	Parametric equation of a circle
	24	Line & A Circle
	25	Tangent and normal
	26	Director circle Length of Tangent & Power of a point
	27	Equation of chord with given middle point
	28	Chord of contact, Pair of Tangents , Family of circles,Pole & Polar ,Common tangents to two circles,Radical Axis & Radical Centre ,Coaxial system of circles
Parabola - 8	1	Introduction to conic sections ,General equation of a conic , Centre of the central conic,Standard equation of parabola, Shifted parabola
	2	Position of a point relative to a parabola, Focal distance/focal radii 8. Parametric coordinates,Chord joining two points t1 and t2,Tangents to the parabola ,Length of chord of the conic intercepted on line
Ellipse - 8	1	General equation of an ellipse , Deriving standard equation of ellipse ,Tracing of an ellipse, Two standard ellipse ,Eccentricity Shifted ellipse, Generalized version
	2	Position of a point relative to an ellipse , Focal distance / focal radii , Auxiliary circle/eccentric angle/ parametric coordinates , Chord joining two points whose eccentric angles are a & b
Hyperbola - 5	1	General equation of a hyperbola , General terminology of hyperbola , Two standard hyperbola , Shifted hyperbola
	2	Conjugate hyperbola, Position of a point 'P' w.r.t. A Hyperbola , Auxiliary Circle/eccentric angle / parametric coordinates , Chord joining two points of hyperbola
	3	Tangents to the hyperbola*, An important concept ,Normal's to the hyperbola , Common articles
	4	Rectangular hyperbola, Important highlights
Vector - 15	1	General definitions, Angle between vectors , Section formula, Geometrical results with vectors & problems
	2	Vector equation of a line, Vector equation of the bisectors of the angles between the lines
	3	Test of collinearity, Scalar product (dot product)
	4	Linear combination, Fundamental theorem in plane
	5	Vector product (cross product) , Shortest distance between 2 skew lines
	6	Shortest distance between two parallel lines,Product of 3 or more vectors
	7	Necessary & sufficient condition for coplanarity of four points , Fundamental theorem in space , Real definition of linearly independent
	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
	8	Definition of plane
	9	Different forms of the equations of planes
3 - D : 15	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
	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
	18	Coplanarity of two lines
	19	Line of Greatest slope in a plane
	1	General introduction
	2	Algebra of complex numbers
	3	Equality In Complex Number
	4	Three Important terms : Conjugate/Modulus/ Argument
	5	Representation of a complex in different from
	6	Important Properties of conjugate
	7	Important Properties of Modulus
	8	Important Properties of Amplitude
Complex Number - 15	9	Vectorial Representation of a complex number
	10	Angle between lines
	11	Condition for lines to be parallel
	12	Condition for lines to be perpendicular
	13	Straight line & Circles on complex plane
	14	Demoivre's Theorem
	15	Cube Root of Unity
	16	nth Roots of Unity
	17	General locii on complex plane
	1	General introduction & Historical development
	2	Fundamental principle of counting
	3	Significance / meaning of the title of the chapter
	4	Useful theorems (For faster execution rate of the problems), Examples
Permutation & Combination - 5	5	Formatting of groups
	6	Permutation of alike objects
	7	Circular Permutation
	8	Total number of combinations
	9	Summation of numbers
	10	Distribution of alike objects
	11	General / Miscellaneous
	1	Introduction
	2	Basic definition
	3	Venn diagrams
	4	Addition theorem
	5	Conditional probability
	6	Multiplication theorem
	7	Independent Events
	8	Law of total probability
Probability - 15	9	Three events defined on an experimental performance
	10	Binomial Probability Distribution
	11	Probability through Statistical (stochastic) Tree diagram
	12	Baye's Theorem

	13	Extended Bayes
	14	Geometrical Probability
	15	Mathematical Expectation
	16	Probability Distribution (for JEE-Mains)
JEE Main topics - 5	1	Sets & Relation
	2	Height & Distance & PMI
	3	Statistics
	4	Mathematical Reasoning
Determinant - 6	1	Introduction
	2	Cofactor and minors of an element
	3	Properties of determinants
	4	Special determinants
	5	Factor theorem
	6	Multiplication of two determinants
	7	Cramer's rule (System of linear equations)
	8	Applications of determinant in geometry
Matrices - 10	1	Definition
	2	Special type of matrices
	3	Algebra of matrices
	4	Properties of matrix multiplication
	5	Positive integral powers of a square matrix
	6	Matrix polynomial
	7	Characteristic equation
	8	Definitions
	9	The transpose of a matrix : (Changing rows & columns)
	10	Orthogonal matrices
	11	Symmetric & skew symmetric matrix
	12	Properties of symmetric and skew matrix
	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