IMPORTANT FORMULAE
1. ELECTROSTATICS GIST

S. No.	FORMULAE	SYMBOLS	APPLICATION
1.	$Q = \pm N e$	Q = Charge, N = Number of Charge particle	Quantization of charges
2.	$F = k\frac{Q_2 Q_1}{r^2}$	Q1, Q2 are point charges F= Force	To find force between tow point charges
3.	$F = Q E$	E = Electric field	Relation between F and E
4.	$E = k\frac{Q}{r^2}$	$k = \frac{1}{4\pi \epsilon_0}$, r= distance ϵ_0= Absolute permittivity	Electric field due to a point charge.
5.	$\emptyset_E \oint \vec{E} \cdot \vec{ds} = E \oint ds \cos\theta$	ds = small area	To find electric flux
6.	$\emptyset_E = \frac{q}{\epsilon_0}$	$\emptyset$ = Electric Flux	Gauss Theorem
7.	$\Delta V = V_A - V_B = \frac{W_{AB}}{q}$	ΔV = potential difference V_A=Electric potentail at A V_B=Electric potentail at B q=charge	To find the potential difference using Work done from a point A to a point B
8.	$V = k\frac{q}{r}$	$k = \frac{1}{4\pi \epsilon_0}$ r = distance	Electric potential due to a point charge
9.	$V = k\frac{p\cos\theta}{r^2}$	p = dipole moment	Electric potential due dipole
10.	$E = \frac{-dV}{dr}$	dV / dr=potential gradient	Relation between electric field and potential
11.	$U = W = k\frac{q_1 q_2}{r_{12}}$	U = Potential Energy W = Work done	Potential energy of a system of two point Charges
12.	$E = \frac{\lambda}{2\pi\epsilon_0 R}$	λ = linear charge density	Filed intensity due to infinitely long straight uniformly charged wire
13.	a) outside the shell: $E = k\frac{q}{r2}$ b) on the shell: $E = k\frac{q}{R^2} As\ q = 4\pi R^2 \sigma$ $E = \sigma/\epsilon_0$ d) inside the shell : E=0	r = radius of Gaussian surface (outside the shell) R=radius of shell σ =surface charge permittivity	Filed intensity du to uniformly charged spherical shell

14.	$E = \frac{\sigma}{2\epsilon_0}$	E = Electric field ϵ_0 = electric permittivity	Field intensity due to thin infinite plane sheet of charge
15.	$C = 4\pi\epsilon_0 r$	C=capacitance r=radius of conductor	Capacity of isolated spherical conductor
16.	$C = \frac{\epsilon_0 A}{d}$	A = area of plates d = distance between the plates	Capacitance of a parallel plate capacitor
17.	Grouped capacitors: a) In series. $\frac{1}{C_s} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}$ b) In parallel: $C_p = C_1 + C_2 + C_3$	C_s= equivalent capacitance in series C_p=equivalent capacitance in parallel	To calculate equivalent capacitance of a circuit
18.	$U = \frac{1}{2}\frac{Q^2}{C} = \frac{1}{2}CV^2 = \frac{1}{2}QV$	U = Electrostatic energy stored in capacitor	Energy stored in a capacitor
19.	$U = \frac{1}{2}\varepsilon_0 E^2$	E = electric field strength	Energy density of a parallel plate capacitor
20.	$V = \frac{C_1 V_1 + C_1 V_1}{C_1 + C_2}$	V = Common potential	To find Common potential due to sharing of charge
21.	$E_1 - E_2 = \frac{C_1 C_2 (V_2 - V_2)^2}{2(C_1 + C_2)}$	E_1 - E_2 Loss fo energy	Loss of energy due sharing charges
22.	$K = 1 + \chi$	K = dielectric constant χ = electric susceptibility	Relation between dielectric constant & electric susceptibility
23.	$C = \frac{C_0}{(1 - \frac{t}{d})}$	t =thickness of slab d=distance between the plates C_0=capacitance	Capacitance of parallel plate capacitor with conducting slab in between
24.	$C = \frac{\epsilon_0 A}{d - t(1 - \frac{1}{K})}$	K=dielectric constant	Capacitance of parallel plate capacitor with dielectric slab in between

25.	I	Values of Different quantities after Introducing dielectric slab between the plates of the charged capacitor :

Description	When Battery connected	When Battery disconnected
Charge	$K Q_0$	Q_0
Potential difference	V_0	V_0/K
Electric field	E_0	E_0/K
Capacitance	KC_0	KC_0
Energy	K times $\frac{1}{2}\varepsilon_0 E^2$ [Energy is supplied By battery	1/K time $\frac{1}{2}\varepsilon_0 E^2$ [Energy used for Polarization

Unit-2 : CURRENT ELECTRICITY

S. No.	FORMULAE	SYMBOLS	APPLICATION
1.	$I = \frac{Q}{t} = \frac{ne}{t}$	I=current, Q=charged, t=time, e=charge of electron	To find the current in a current carrying wire.
2.	V = IR (Ohms law)	V=Potential difference, R=resistance	Relation between V and I
3.	$I = neAV_d$ (n = number density of free electron)	V_d=Drift Velocity A=area of cross section	Relation between current and drift velocity
4.	$R = \frac{\rho l}{A} = \frac{ml}{ne^2\tau A}$	R = Resistance , ρ = Resistivity τ = relaxation time, m= mass of electron	Relation between (i) R and ρ (ii) R and relaxation time
5.	$\rho = \frac{RA}{l} = \frac{m}{ne^2\tau}$	e=charge of electron ρ =conductance,	Relation for resistivity and relaxation time τ
6.	$C = \frac{1}{R}$ and $\sigma = \frac{1}{\rho} = \frac{l}{RA}$	C=conducatine, σ =conductivity	To find C and σ
7.	$J = \frac{I}{A} = neV_d$ $j = \sigma E$	j = current density, σ = conductivity	Relation between j with V_d and j with E
8.	$\mu = \frac{V_d}{E} = \frac{e\tau}{m}$	μ = mobility of electron	To find μ from V_d
9.	$\rho = \rho_0 [1 + \alpha(T - T_0)]$	α = temperature coefficient of resistance	Variation of P with temperature
10.	$\alpha = \frac{R_2 - R_1}{R_1 (T_1 - T_2)}$	$T_1 - T_2$ = temperature difference	Formula for α
11.	$R_s = R_1 + R_2 + R_3 + ...$	R_s = equivalent resistance in series combination	Series combination
12.	$1/R_p = 1/R_1 + 1/R_2 + 1/R_3 + ...$	R_p = equivalent resistance in series combination	Parallel combination
13.	$P = VI = I^2 R = V^2/R$	P = electrical power	Relation for P with V, I and R
14.	E = V +Ir = I (R + r)	E = emf of cell,	Relation for E and V
15.	(I) V = E - Ir (ii) V = E + Ir	r = internal resistance V = Potential difference	(I) Current is drawn (ii) cell is being charged
16.	$r = (\frac{l_1}{l_2} - 1)R$	r = internal resistance R = External resistance	To find internal resistance by potentiometer
17.	$I = \frac{nE}{(R+nr)}$	n = number of cells in series R = External resistance	Current drawn when n cells are connected in series

18.	I = $\frac{mE}{(mR+r)}$	m = number of cells in parallel	Current drawn when n cells are connected in parallel
19.	I = $\frac{mnE}{(mR+nr)}$	m = number of rows n = number of cells in each row.	For max. current the external resistance must be equal to the total internal resistance
20.	$\Sigma I = 0$ (loop rule) $\Sigma \Delta V = 0$ (junction rule)	ΣI algebraic sum of charge ΣV algebraic sum of potential difference	Kirchhoff' s law
21.	$\frac{P}{Q} = \frac{R}{S}$	P, Q, R, S are resistences in four arms of Wheatstone Bridge	Balanced condition of Wheatstone Bridge
22.	S = $\left(\frac{100-l}{l}\right) R$	S = Unknown resistance R = Known resistance	Working condition for Wheatstone Bridge
23.	V = K L	V= Potential drop a wire L= Balancing length	Principle of Potentiometer Cell.
24.	$\frac{E_1}{E_2} = \frac{l_1}{l_2}$	E_1 and E_2, emf of two cells l_1 and l_2 balancing length	Comparison of emf's of two cell.

Unit-3 : MAGNETIC EFFECTS OF CURRENT AND MAGNETISM

SL. No.	FORMULAE	SYMBOLS	APPLICATIONS
1.	Biot - Savart Law $dB = \frac{\mu_0}{4\pi} \times \frac{I\,dl\,Sin\theta}{r^2}$	dB = magnetic field at a point at distance r due to a current element. μ_0 = permeability of free space I = current through wire θ = angle between current element Idl and position vector r.	To find magnetic field at a point due to current element. To find magnetic field due to a straight conductor.
2.	$B = \frac{\mu_0 N I a^2}{2(a^2+x^2)^{\frac{3}{2}}}$	B= magnetic field due to a circular coilof N turns at distance X from its center. a = Radius of coil	Magnetic field at centre, x = 0 $B = \frac{\mu_0 N I}{2a}$
3.	$B = \frac{\mu_0 N I}{2\pi r}$	B = magnetic field r = perpendicular distance from wire to point of observation.	magnetic field due to a straight conductor of infinite length
4.	Ampere's circuital law $\oint \vec{B} \cdot \vec{dl} = \mu_0 I$	$\oint \vec{B} \cdot \vec{dl}$ = Line integral of magnetic field in a closed path.	magnetic field due to a solenoid $B = \mu_0 N I$
5.	$\vec{F} = q(\vec{v} \times \vec{B})$ $F = B q v \sin\theta$	F = Force o V= velocity of charge particle q = charge of the particle	Force acting on a charge particle in magnetic field.

6.	$\vec{F}=q\,[\vec{E}+(\vec{v}\times\vec{B})]$	Force on charged particle in simultaneous Electric and magnetic fields	Lorentz force
7.	$\vec{F}=I\,(\vec{L}\times\vec{B})$ $F = B\,I\,L\,\sin\theta$	F = Magnetic force on a current carrying conductor of length l B = magnetic field.	To find force acting on a current carrying conductor in a magnetic field.
8.	$\frac{F}{l}=\frac{\mu_0 I_1 I_2}{2\pi r}$	$\frac{F}{l}$ = Force per unit length between two parallel current carrying I_1 and I_2 r = distance between the conductors.	Force per unit length between two parallel current carrying conductors.
9.	$\tau = BINA\sin\theta$	τ = torque experienced by a current loop of area A in magnetic field B N = Number of turns of coil. I = current	magnetic field due to a straight conductor of infinite length
10.	$S=\left(\frac{i_g}{i-i_g}\right)G$	S = shunt required, G = Galvanometer Resistance, i_g = maximum current through galvanometer (0-i) = range of ammeter	Conversion fo Galvanometer into Ammeter.
11.	$R = (V/i_g) - G$	R = high resistance in series	Conversion fo Galvanometer into Voltmeter.
12.	$r = \frac{mv}{Bq}$	r = radius of circular path in magnetic field	To find the radius of circular path of charged particle moving perpendicular to the magnetic field.
13.	$\upsilon = \frac{qB}{2\pi m}$	ν = Cyclotron frequency	To find the frequency of cyclotron.

Unit-4 : ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENT

S. No.	FORMULAE	SYMBOLS	APPLICATION
1.	$\varepsilon = \frac{d\Phi}{dt}$	ε = induced emf.	Faraday's law of electromagnetic induction :
2.	$\varepsilon = -B l v$	B = magnetic field v = velocity l = metal rod of length	Motional emf
3.	$V = ½ B \omega l^2$	V = emf developed between the ends of the rod. ω = angular velocity l = length of the rod	To find emf developed between the end of the rod rotating in the magnetic field.
4.	$\Phi = L I$	Φ = Magnetic flux L = Self-inductance of the coil.	Relation between Φ and L
5.	$\varepsilon = - L\, dI/dt$	L = Self-inductance of the coil.	To find self-induced emf in a coil.
6.	$\varepsilon_1 = - M_{12}\, dI_2/dt$	M_{12} =Coefficient of mutual inductance dI_2/dt=Rate of charge of current in th secondary coil	Self-induced of a solenoid
7.	$L = \mu_r \mu_0 n^2 A l$	μ_r = Realtive permeability μ_0 = permeability of free space n = no of turns of the solenoid A = area of the solenoid L = length of the solenoid	Equation of a.c generator
8.	$\varepsilon = n B A \omega \sin \omega t$ $(\omega = 2\pi v)$	n = no of turns of the solenoid B = magnetic field A = area of the solenoid v = frequency of AC	Equation of a. c generator
9.	$U = \frac{1}{2} L I^2$	U = Energy stored in inductor	To find energy stored in the inductor in its magnetic field.

Unit-5 : ELECTROMAGNETIC WAVES

S. No.	FORMULAE	SYMBOLS	APPLICATION
1.	$c = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$	c is the speed of electromagnetic wave in vacuum permeability constant and is the permittivity constant	To find speed of e.m. wave in vacuum
2.	$v = \frac{1}{\sqrt{\mu \varepsilon}}$	v is the speed of electromagnetic wave in material medium	To find speed of electromagnetic wave in material medium

Laws at a glance :

1. $\oint \mathbf{E} \cdot d\mathbf{A} = Q / \varepsilon_0$ (Gauss's Law for electricity)
2. $\oint \mathbf{B} \cdot d\mathbf{A} = 0$ (Gauss's Law for magnetism)
3. $\oint \mathbf{E} \cdot d\mathbf{l} = \frac{-d\Phi_B}{dt}$ (Faraday's Law)
4. $\oint \mathbf{B} \cdot d\mathbf{l} = \mu_0 i_c + \mu_0 \varepsilon_0 \frac{d\Phi_E}{dt}$ (Ampere - Maxwell Law)

Unit-6 : RAY OPTICS

S.No.	FORMULAE	SYMBOLS	APPLICATIONS
1.	$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$	u - object distance v - image distance, f - focal length of the mirror	To find focal length of mirror
2.	$m = -\frac{v}{u}$	m = magnification m is negative for real images and +ve for virtual images	To find magnification
3.	$n_{21} = \frac{n_2}{n_1} = \frac{\sin\left(\frac{A+Dm}{2}\right)}{\sin\frac{A}{2}}$	A = Angle of prism n_2 = refractive index of prism n_1 = refractive index of medium D_m = angle of minimum deviation.	To find refractive index
4.	$\frac{n_2}{v} - \frac{n_1}{u} = \frac{n_2 - n_1}{R}$	R = Radius of curvature V = image distance, u = object distance	To find Rad. of curvature of lens

S. No.	FORMULAE	SYMBOL	APPLICATION
5.	$\frac{1}{f}=\left(\frac{n_2-n_1}{n_1}\right)\left(\frac{1}{R_1}-\frac{1}{R_2}\right)$	R_1, R_2 = Radius of curvature f = focal length of the lens n_1, n_2 = Refractive index of medium 1 and respectively	Lens makers formula To find focal length of lens
6.	$\frac{1}{f}=\frac{1}{f_1}+\frac{1}{f_2}+\frac{1}{f_3}$	f = effective focal legnth of combination f_1, f_2, f_3 = focal length of each lens in contact.	To find effective focal length of combination of lenses
7.	$m=\frac{L}{fo}X\frac{D}{fe}$	m: magnifying power of a compound microscope f_0 = focal length of objective f_e = focal length of eyepiece L= Distance between objective lens and eye lens	To find magnifying power of a compound
8.	$m=\frac{\beta}{\alpha}=\frac{f_0}{f_e}$	m: magnifying power of a telescope f_0 = focal length of objective f_e = focal length of eyepiece β = angle subtended at the eye by the image α = angle subtended at the eye by the object	To find magnifying power of a telescope

WAVE OPTICS

S.No.	FORMULAE	SYMBOL	APPLICATIONS
1.	$\mu=\tan i_p$	μ = relative refractive index of the denser medium i_p = polarizing angle.	To find refractive index of the material
2.	$I=I_0\cos^2\theta$	I_0 = intensity of light passing through the polarizer, θ = angle between polarizer and analyzer.	To find intensity of light
3.	$\beta=\frac{\lambda D}{d}$	β = fringe width λ = wavelength of light D = distance between the slits and the screen d = distance between the lists	To find fringe width for interference fringes

4.	$w = \frac{(2\lambda D)}{a}$	λ = wavelength of light used, D = distance between the slits and the screen w= width of central maxima in diffraction	To find width of central maxima for diffraction fringes
5.	$\frac{Imax}{Imin} = \frac{(a+b)^2}{(a-b)^2}$	Imax = Max. intensity Imin = Min. intensity a, b = respective amplitudes	To find ratio of max. and min. intensity

UNIT 7 : DUAL NATURE OF MATTER

S.No.	FORMULAE	SYMBOL	APPLICATIONS
1.	$E = h\nu = h\frac{c}{\lambda}$	E = energy of photon, h = Plank's constant, v = frequency	To find the energy of photon
2.	$W_0 = h\nu_0 = hc/\lambda_0$	W_0 = work function ν_0 = threshold frequency λ_0 = threshold wavelength	Relation between work function and V_0, λ_0
3.	$K_{max} = \frac{1}{2}mv^2_{max} = h\nu - w_0 = h(\nu - \nu_0)$	K_{max} = Maximum kinetic energy of emitted electrons V_{max} = maximum velocity	Einstein's photoelectric equation.
4.	$K_{max} = \frac{1}{2}mv^2_{max} = eV_0$	e = charge of electron V_0 = stopping potential	Relation between maximum kinetic energy and stopping potential.
5.	$\lambda = \frac{h}{mv}$ or $\lambda = \frac{h}{p}$	λ = wave length of matter wave h = Plank's constant	De Broglie wavelength for matter wave.
6.	$\lambda = \frac{h}{\sqrt{2mE}} = \frac{h}{\sqrt{2mqV}}$	E= kinetic energy V = accelerating potential	Relation between λ and E, V
7.	$\lambda = \frac{h}{\sqrt{2meV}}$, $\lambda = \frac{12.27}{\sqrt{V}}$ A^0	V = accelerating potential	De Broglie wavelegth for electron

UNIT 8 : ATOMS AND NUCLEI

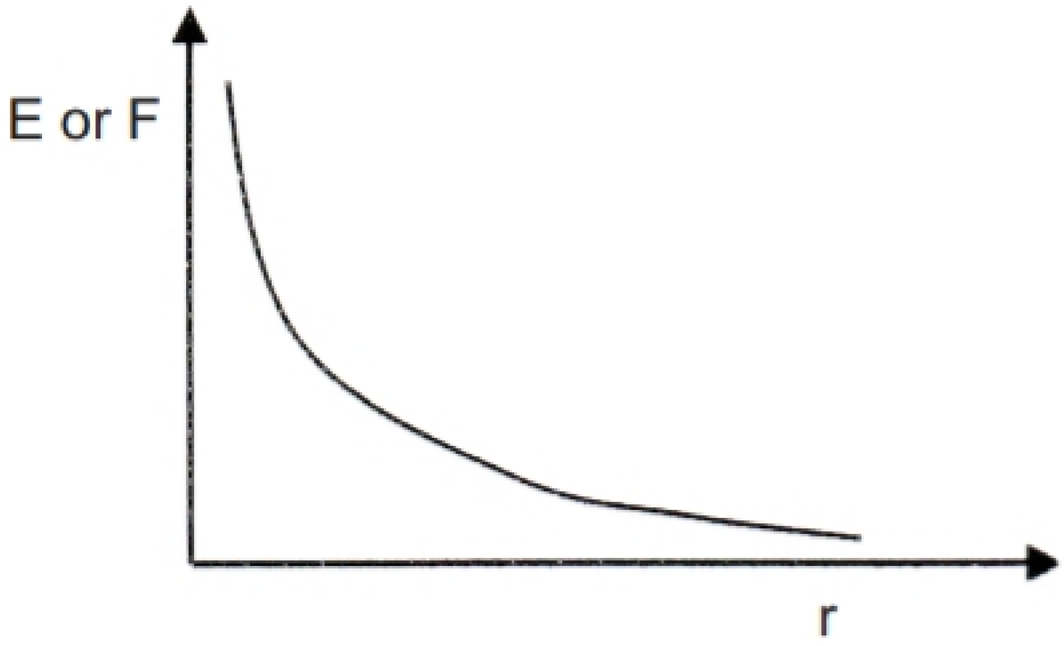
S.No.	FORMULAE	SYMBOL	APPLICATIONS
1.	$r_0 = \frac{k4Ze^2}{mv^2}$	$k = \frac{1}{4\pi\varepsilon_0}$, z = Atomic number of element. m = mass of electron, v = velocity of electron.	To find the distance of closest approach r_0.
2.	$b = \frac{k\,Ze^2\cot\theta/2}{\frac{1}{2}m\,v^2}$	b = impact parameter θ = scattering angle	To find the impact parameter
3.	$r_n = \frac{n^2h^2}{4\pi^2 mkZe^2}$	r_n = Radius of n^{th} orbit	Bohr's radius (Z =1, n =1) r_0 = 0.53A^0
4.	$v = \frac{2\pi kze^2}{nh}$	V = speed of an electron in n^{th} orbit	$\frac{c}{137\,n}$, c = speed of light
5.	$E_n = -\frac{2\pi^2 mk^2 Z^2 e^4}{n^2h^2}$	E_n = Total energy of electron in n^{th} orbit.	$E_n = -\frac{13.6}{n^2}$ Total energy of electron in nth orbit for hydrogen.
6.	$K.E = \frac{kZe^2}{2r}$ $K.E = -E_n$	$k = \frac{1}{4\pi\varepsilon_0}$, Z = Atomic number of element	Kinetic energy of electron Relation between K. E. and total energy
7.	$P.E = -\frac{kZe^2}{r}$ $P.E = 2E_n$	E_n = Total Energy	Potential energy of electron Relation between P.E. and total energy
8.	$\frac{1}{\lambda} = R\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right]$	λ = Wavelength of emitted radiation. R = Rydberg's constant	$\frac{1}{\lambda}$ = Wave number Lyman series : n_1 = 1, n_2 = 2,3,4.. Balmer series: n_1 = 2, n_2 = 3,4,5..
9.	$R = R_0 A^{1/3}$	$R_0 = 1.2 \times 10^{-15}$ m	Relation between Radius of nucleus and mass number
10.	$\rho \quad \frac{m}{\frac{4}{3}\pi R_0^{\,3}}$	ρ = Nuclear density, m = average mass of a nucleon.	Relation between binding energy and mass defect.
11.	$E_B = \Delta m\ c^2$	E_B = Binding Energy Δm = mass defect 1 a.m.u. = 931.5 Mev	Relation between binding energy and mass defect.
12.	$\frac{dN}{dt} = -\lambda N$	$\frac{dN}{dt}$ = Rate of dacay of radio active substances λ = decay constant	Relation active decay law
13.	$N = N_0 e^{-\lambda t}$	N_0 = Number of radioactive nuclei present initially	N = Number of active nuclei left after time t.
14.	$T_{1/2} = \frac{0.693}{\lambda}$	$T_{1/2}$ = half life of a radioctive substance	To find half life period

15.	$N = N_0 (\frac{1}{2})^n$	N0 = Number of radioactive nuclei present initially	Number of radioactive nuclei left in a sample after n half - lives.
16.	$R = \lambda N$	R = activity of a radioactive sample	Relation between R and λ
17.	$\tau = \frac{1}{\lambda}$	τ = Mean life.	$\tau = 1.44\, T_{1/2}$

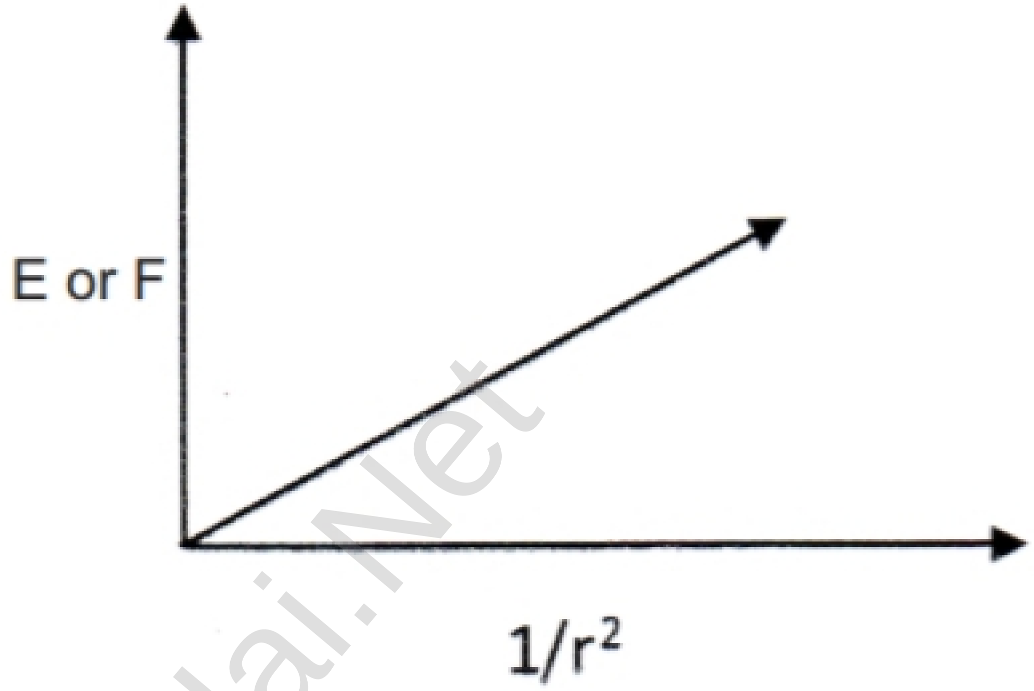
UNIT 9 : ELECTRONIC DEVICES

S.No.	FORMULAE	SYMBOL	APPLICATIONS
1.	$n_e = n_h$.	n_e = free electron density n_h = hole density	Intrinsic semiconductors
2.	$n_e < n_h$		p - type semiconductors
3.	$n_e > n_h$		n - type semiconductors
4.	$n_e . n_h = n_i^2$	n_i = density of Intrinsic carriers	Relation between charge carriers
5.	$I = I_e + I_h$	I_e = current through electrons	Current through a

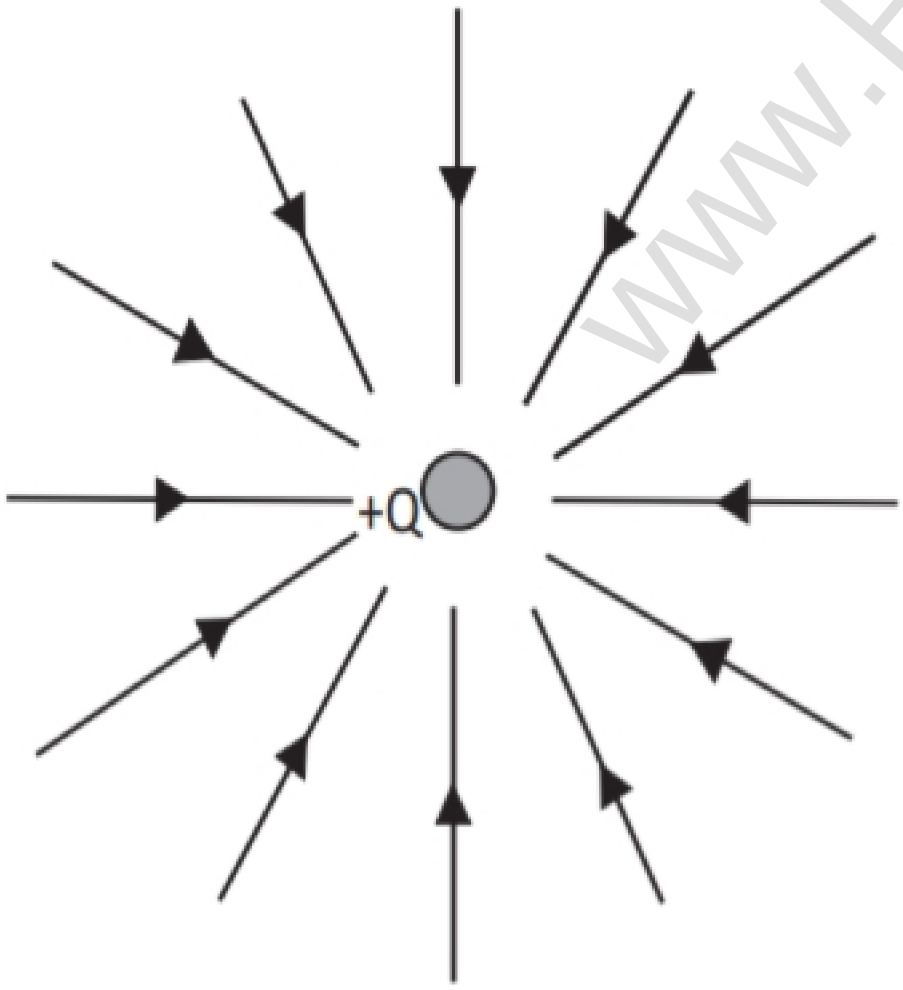
(i) Graph for electric force (F) or electric field (E) verses distance r



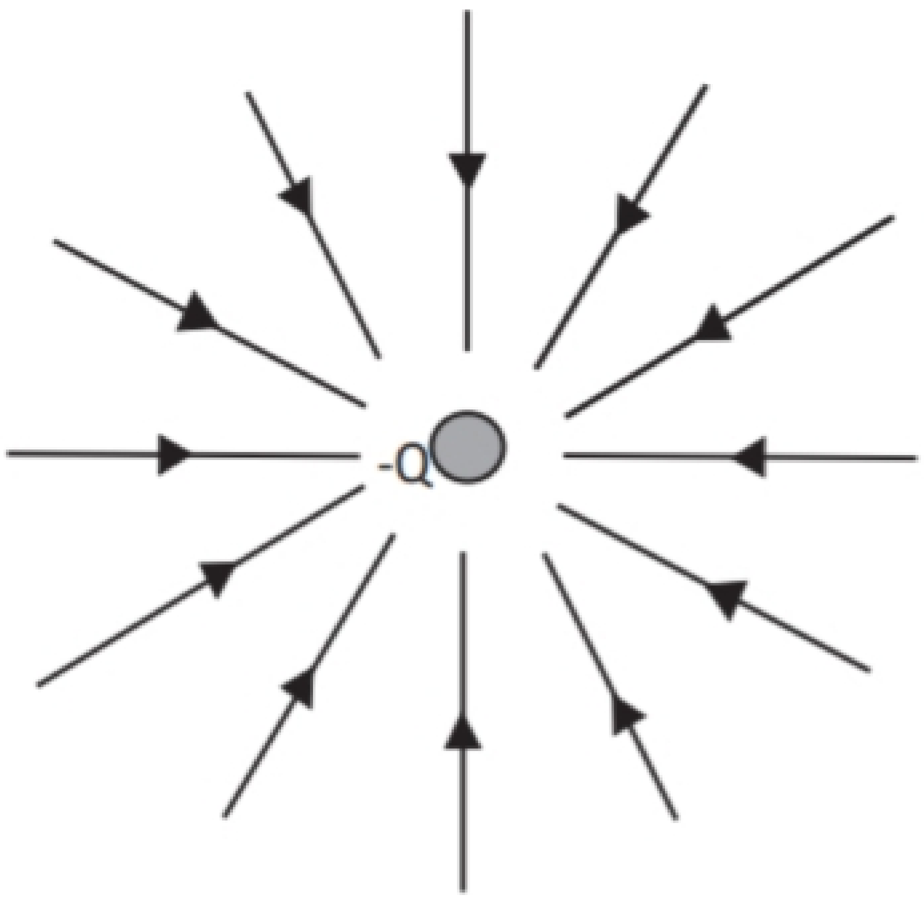
(ii) Graph for E or E verses $1/r^2$



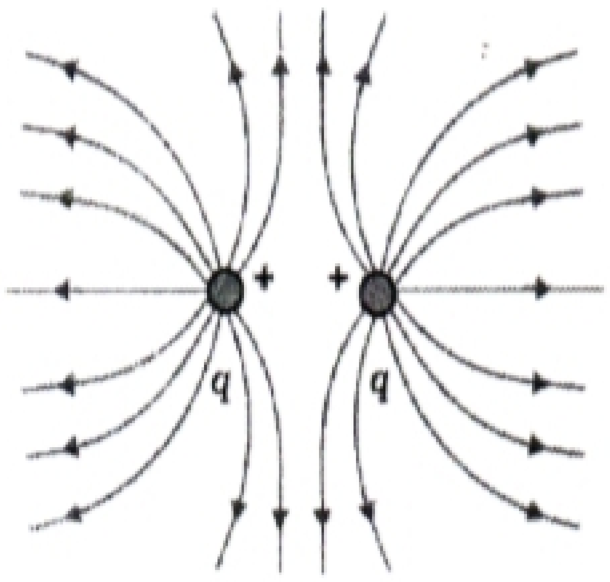
(i) Electric field lines due to a + Q charge.



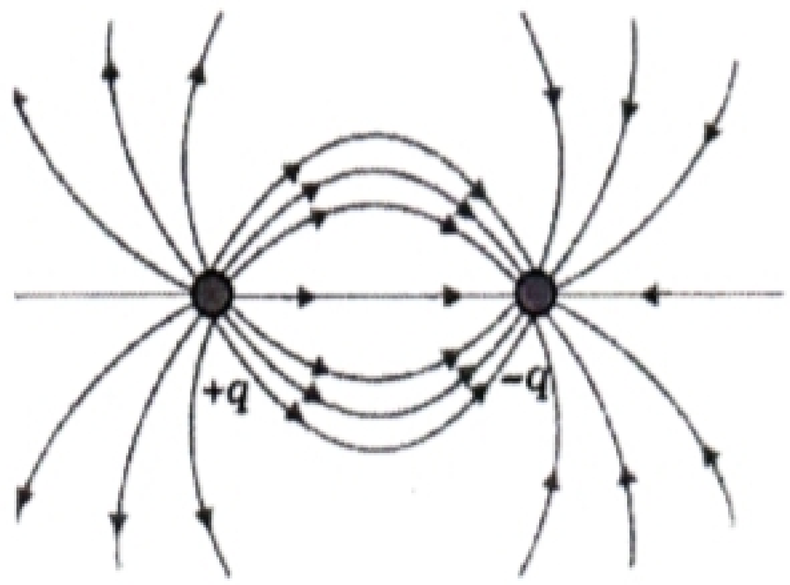
(ii) Electric field due to a -q charge



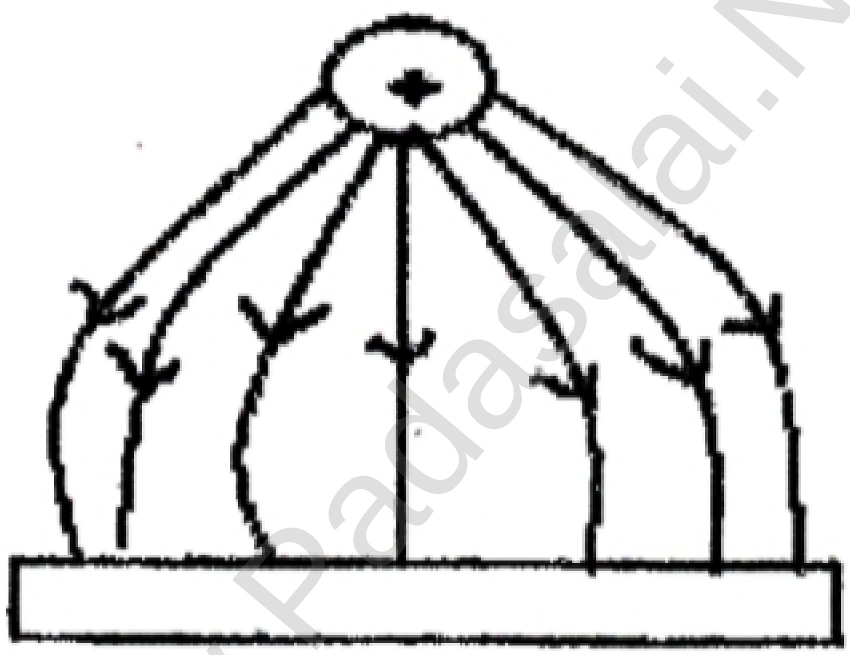
(iii) Electric field lines due to two positive charge.



(iv) Electric field lines due to a electric dipole.

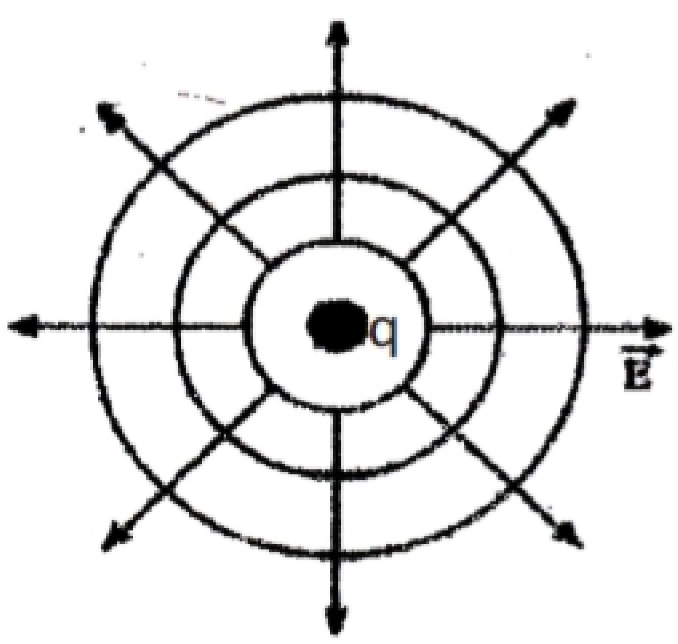


(v) Electric field lines due to a point charges and metal plate

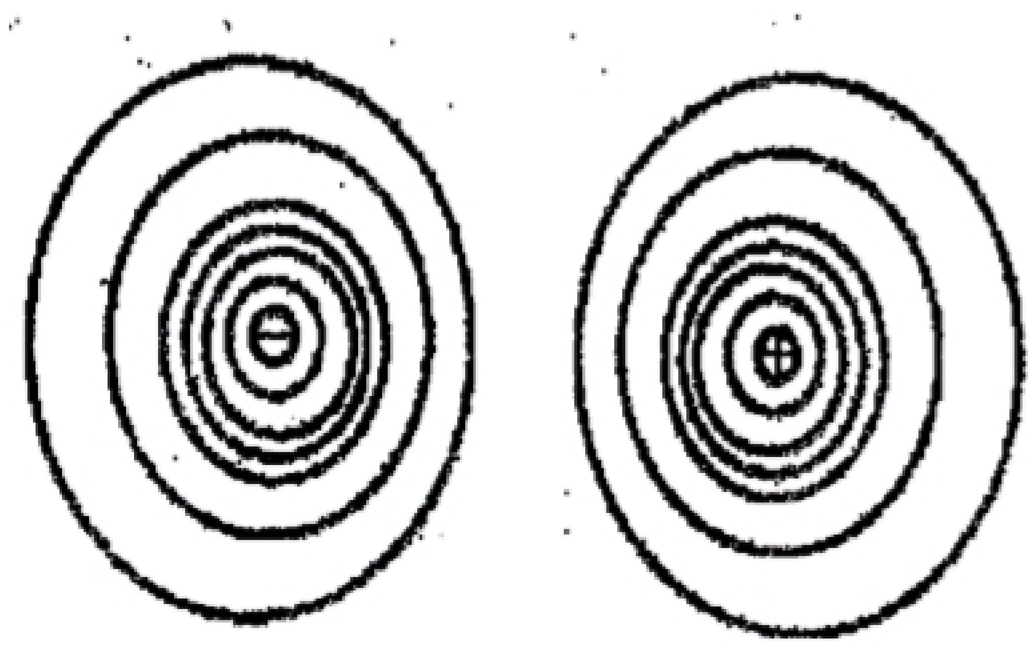


3. Equipotential surfaces

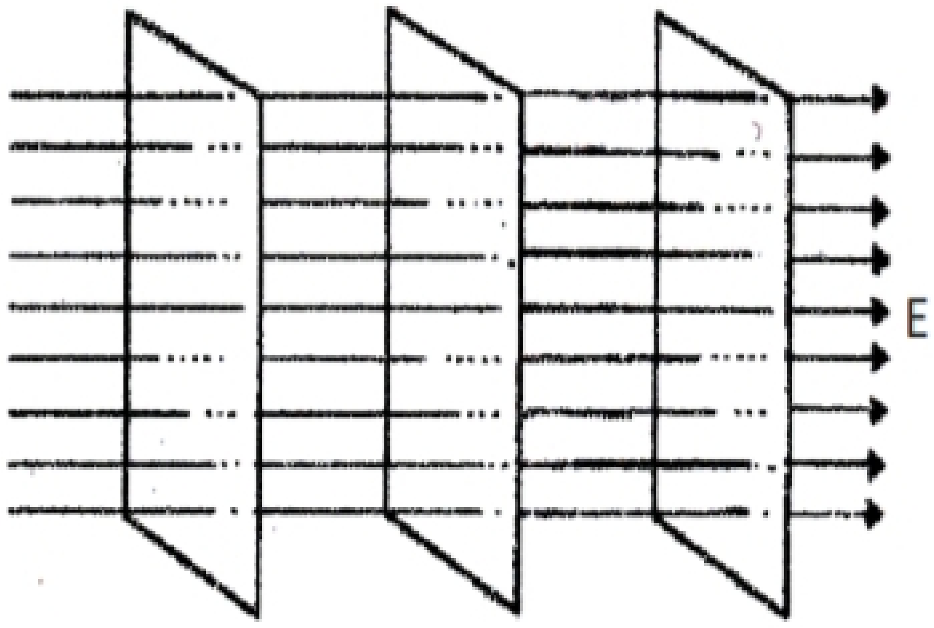
(i) due to a isolated positive charge.



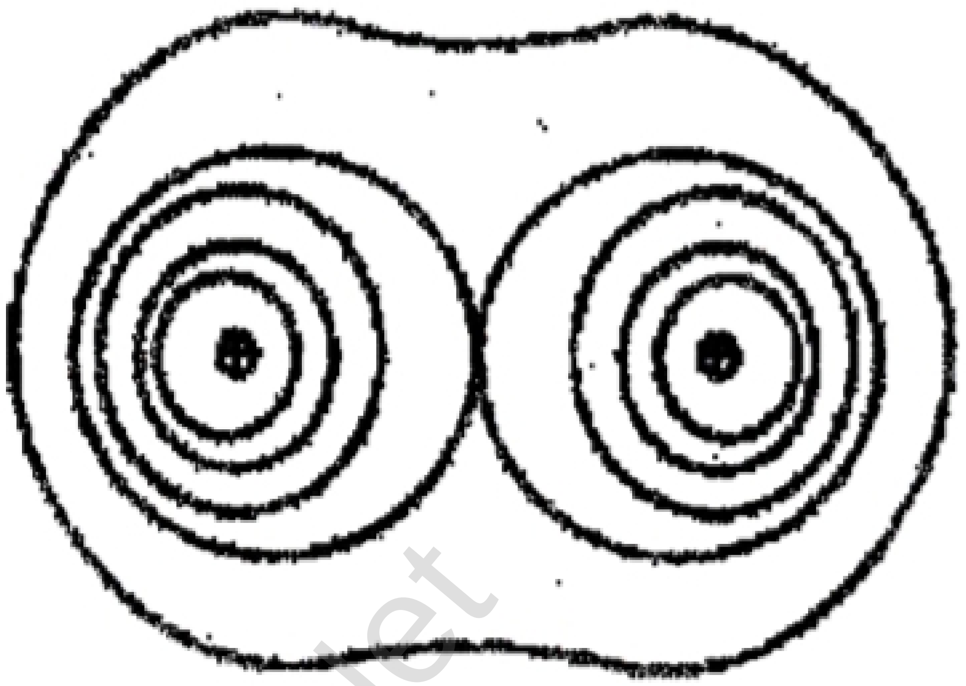
(ii) due to two positive point charge



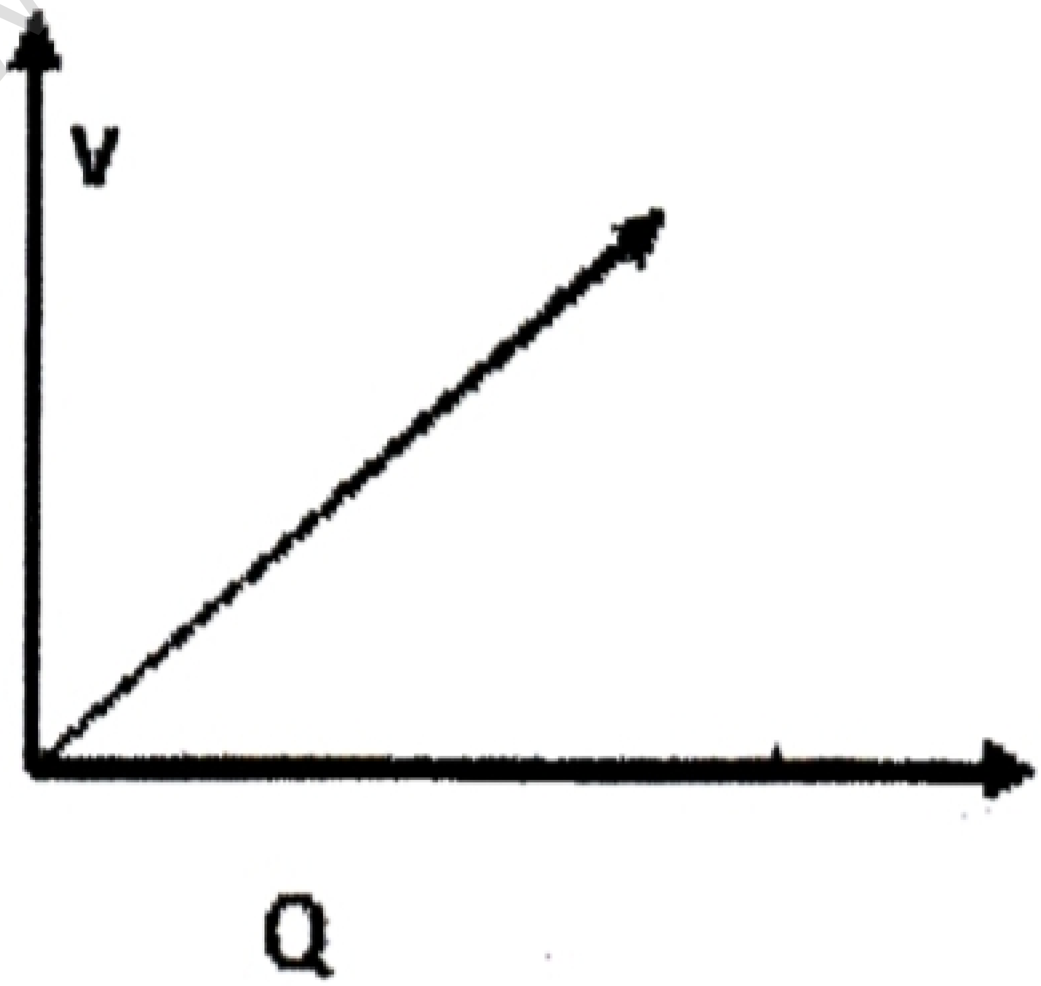
(iii) due to uniform electric field



(iv) due to two positive point charge



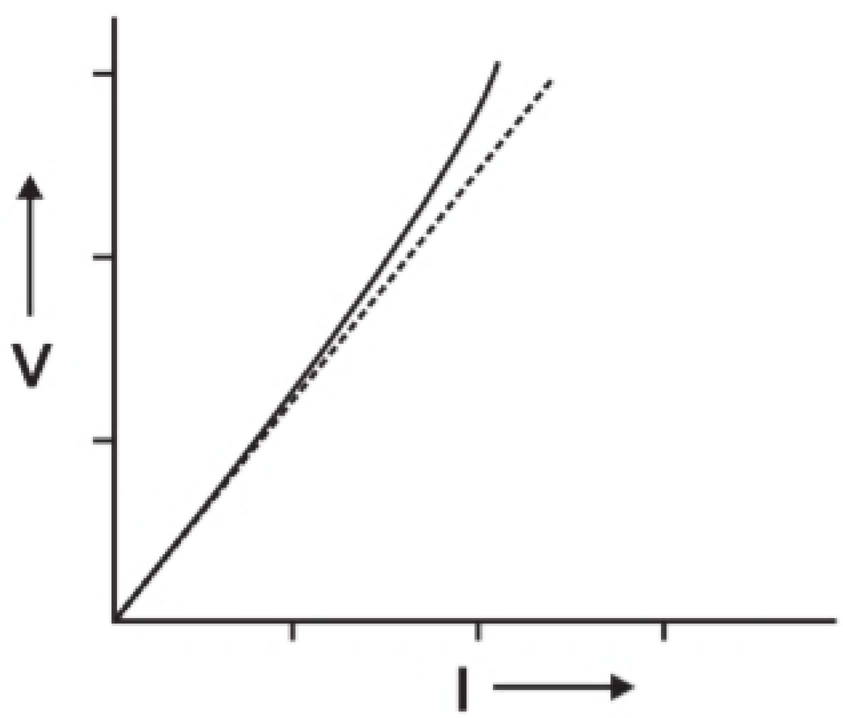
4 (i) Postential verses charge graph for capacitor

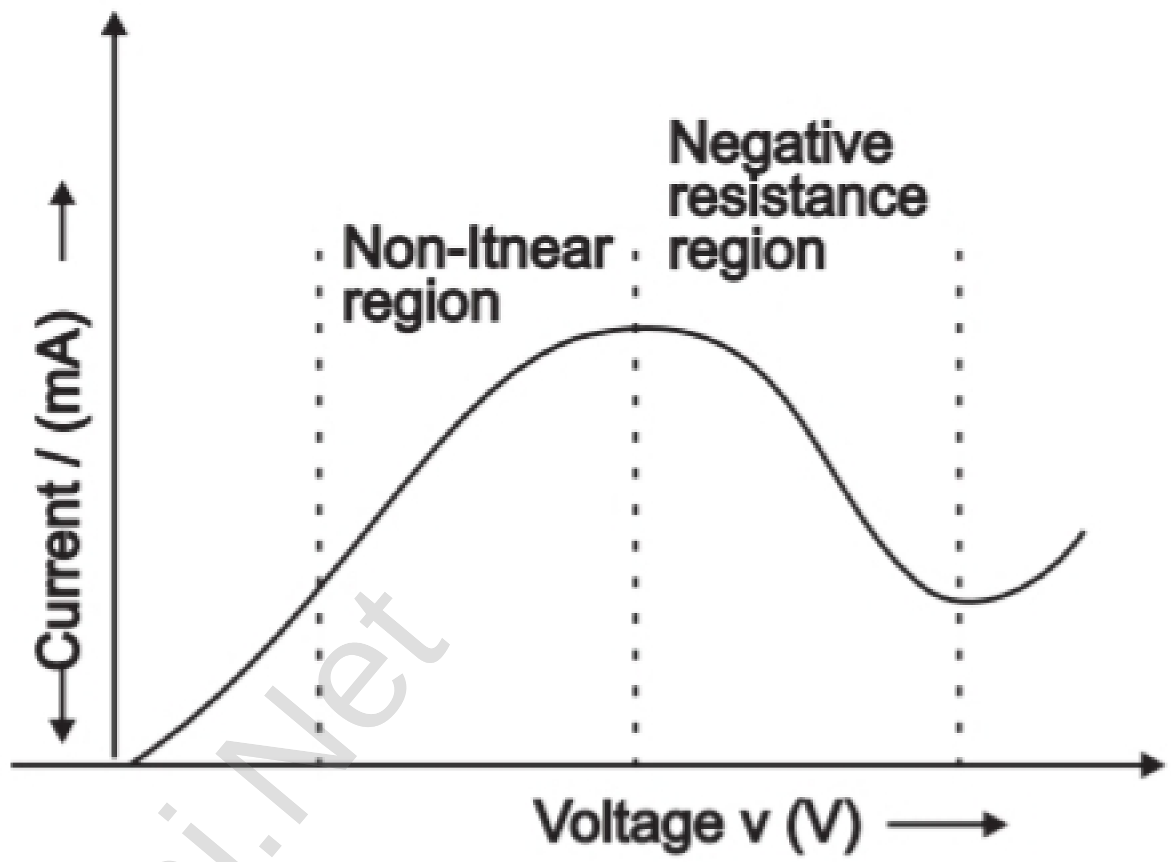


CURRENT ELECTRICITY

1. Variation of current with potential difference

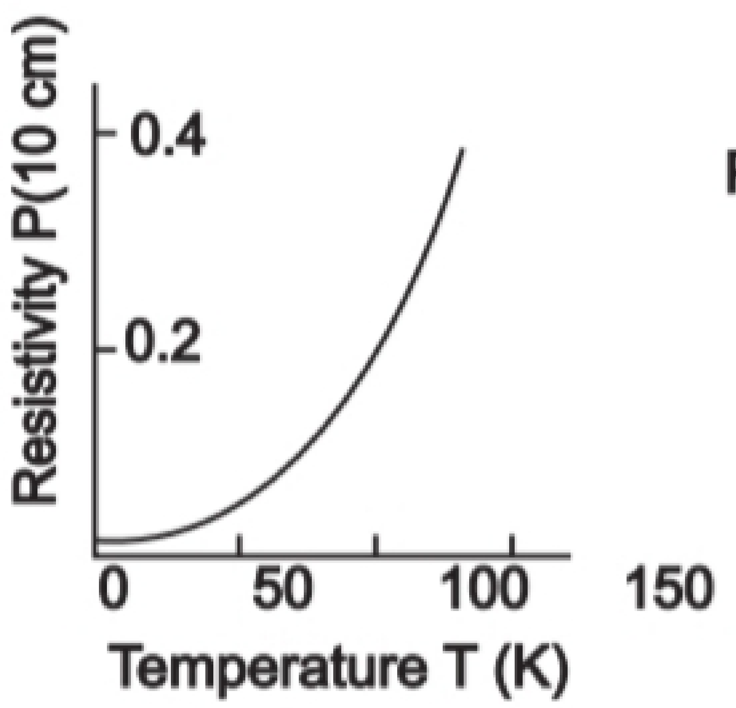
(i) For conductor (ii) For Ga As

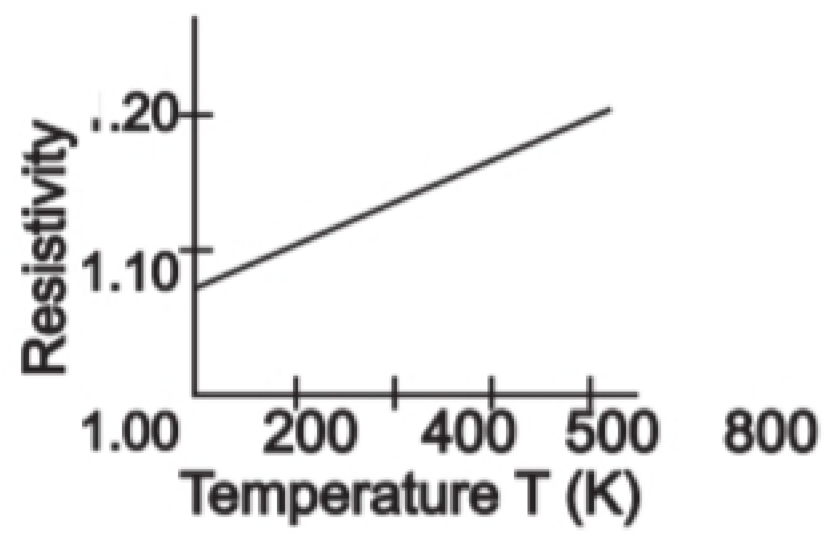




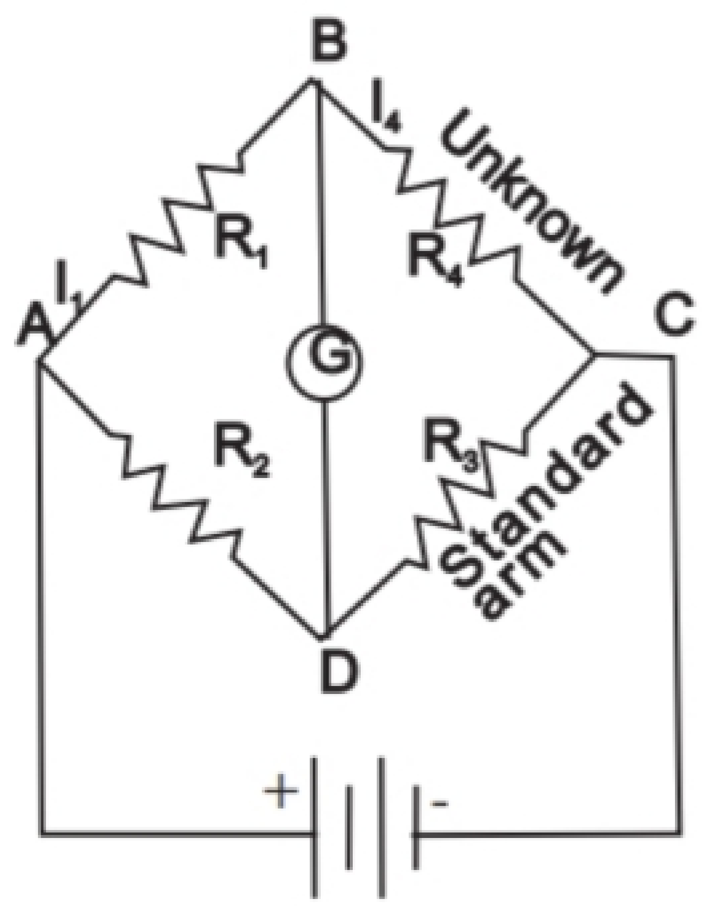
2. Variation of resistivity with temperature

(i) For conductor (ii) For Ga As (iii) for nichrome (alloy)

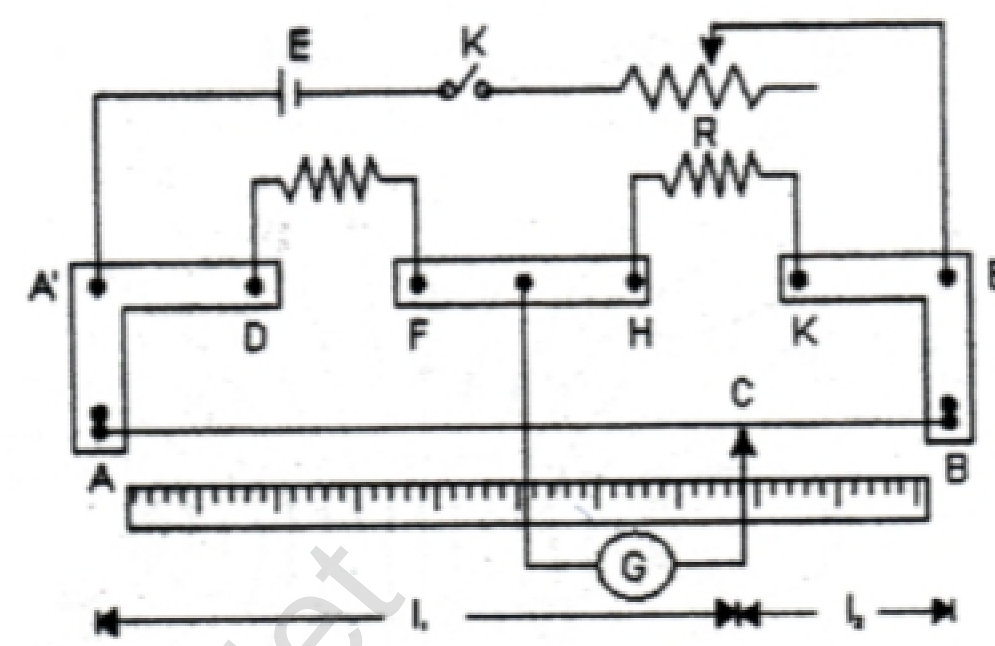




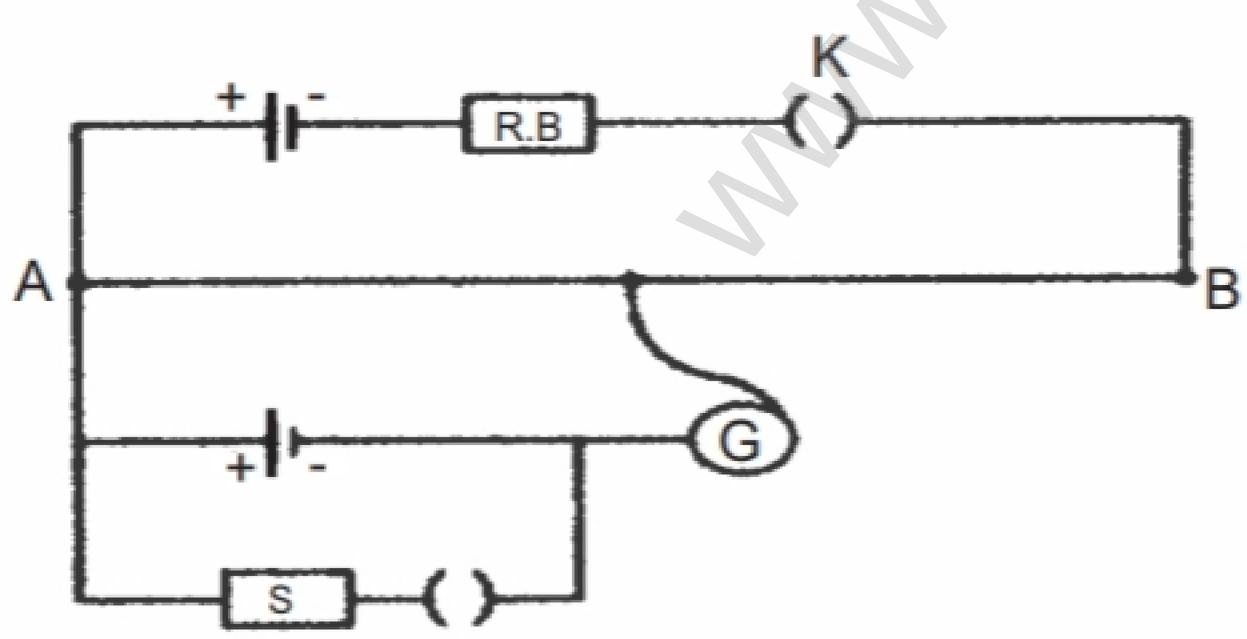
2. (i) Cricuit diagram to find balanced condition for Wheatstone bridge



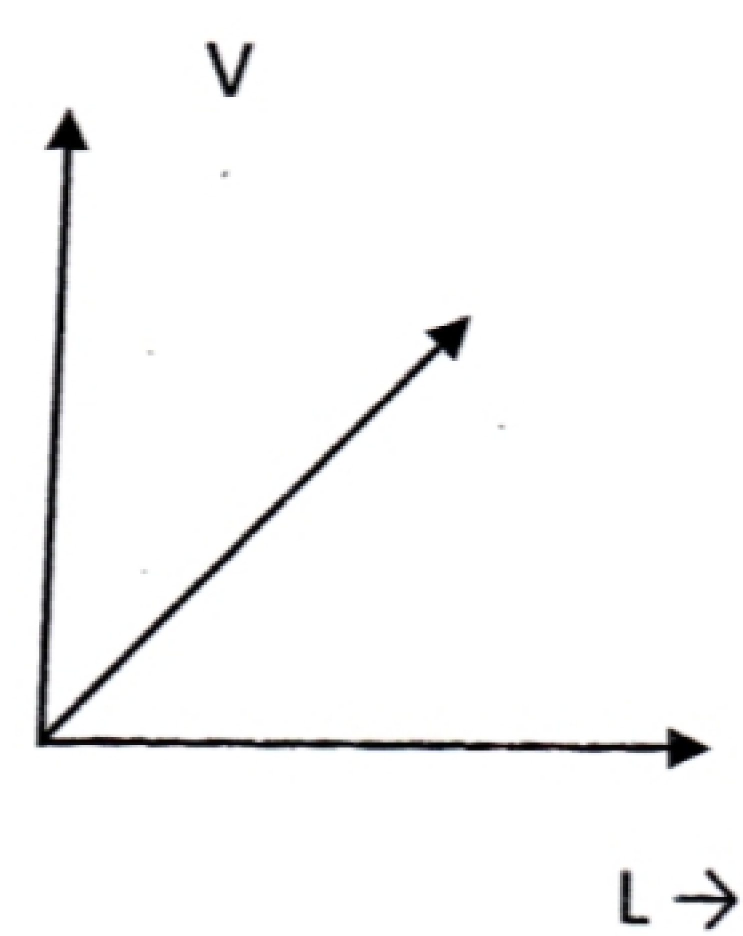
(ii) Cricuit diagram to find the unknown resistance using Metre Bridge.



4 (i)Circuitdiagramtomeasuretheinternal resistanceofacellusingpotentiometer

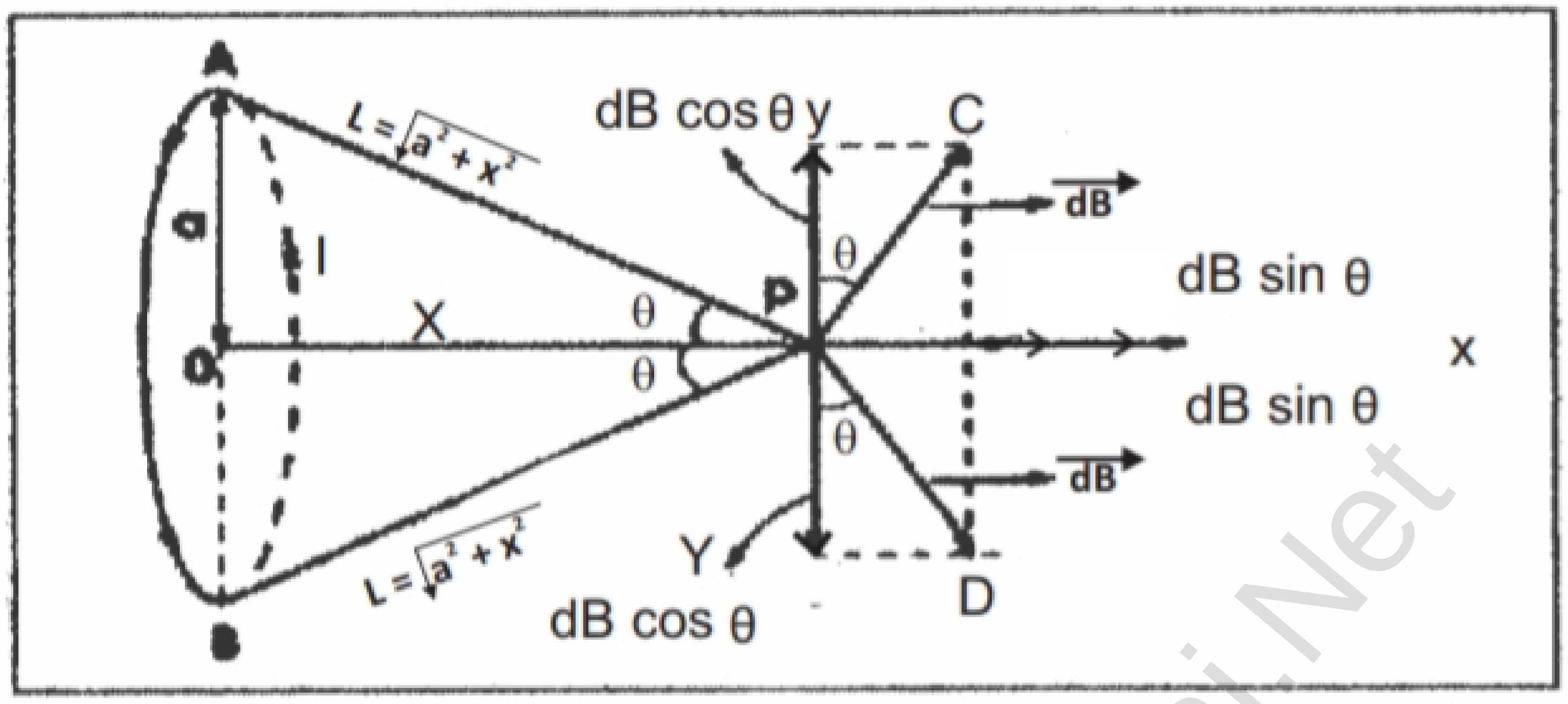


(ii) V verses L graph for the potentiometer



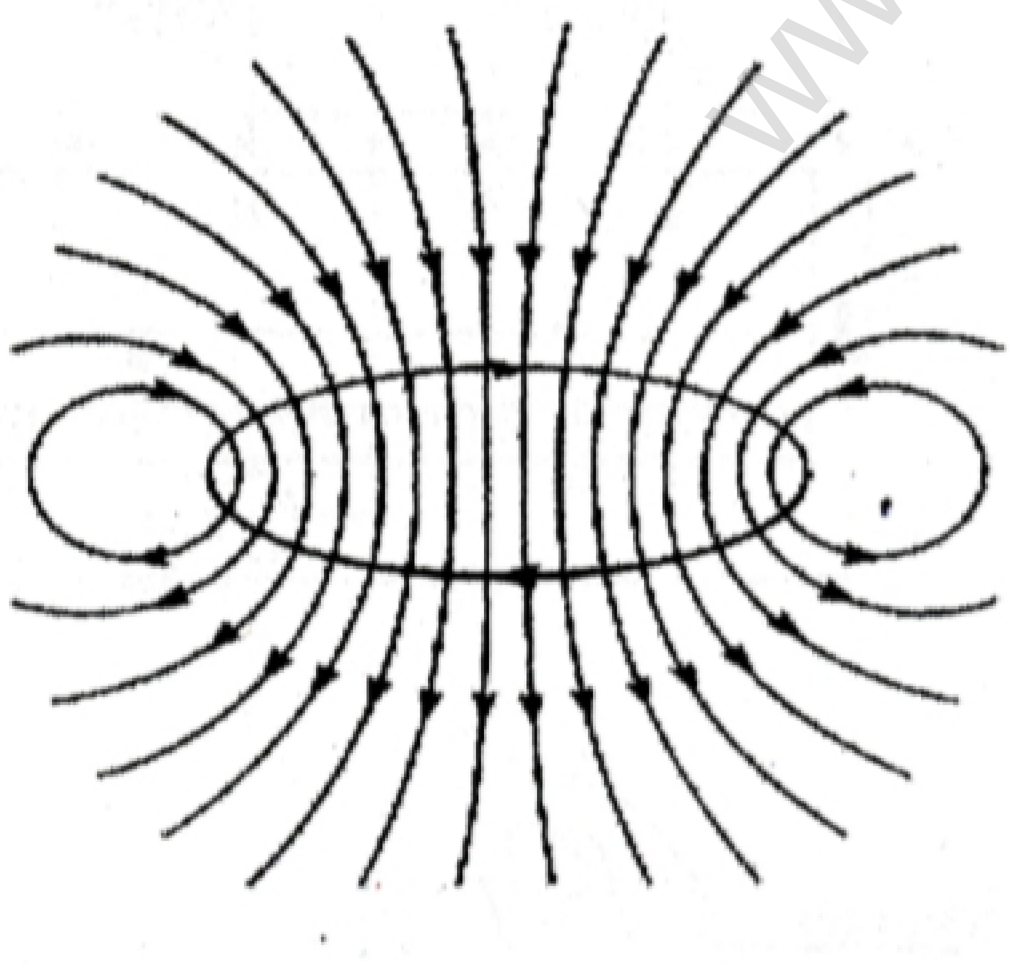
MOVING CHARGES AND MAGNETISM

1. Magnetic field on the axis of a circular current loop.

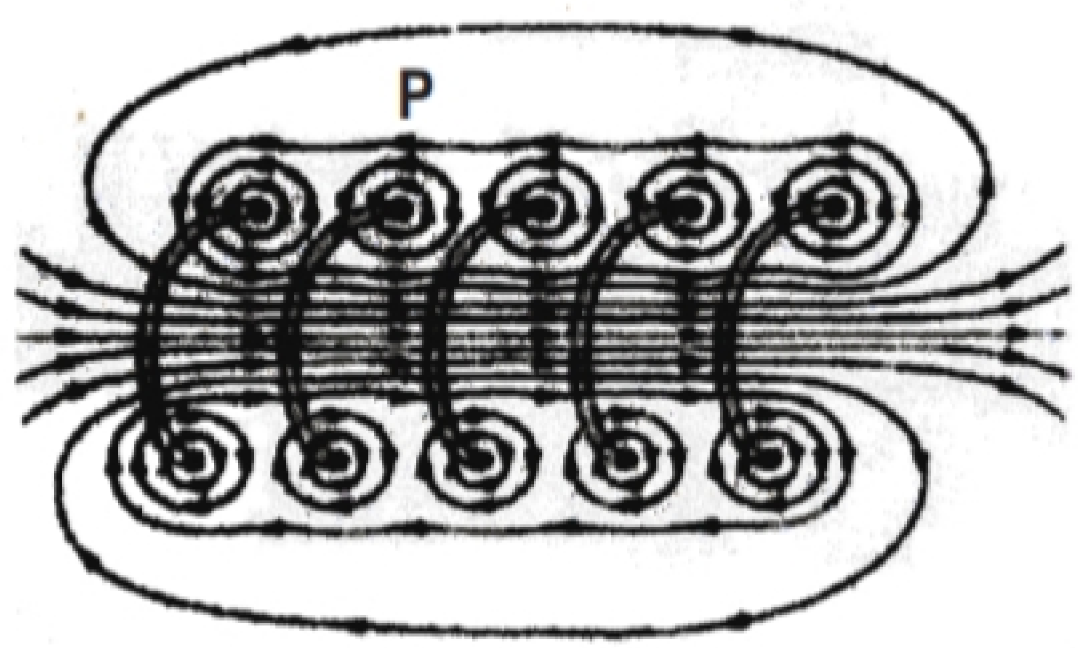


2. Magnetic field line

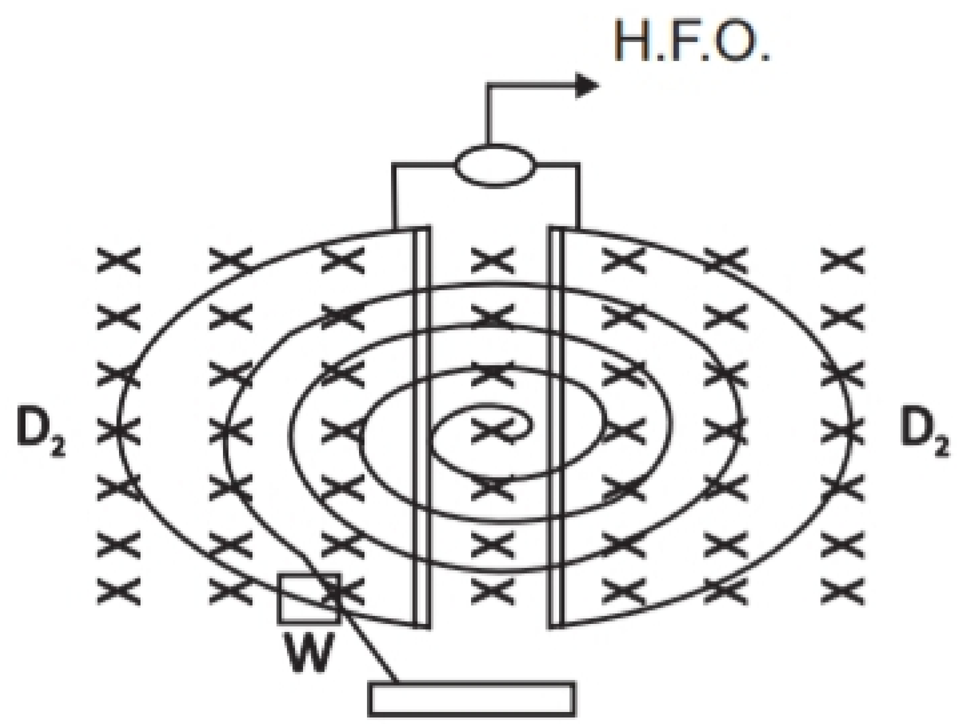
(I) Due to circular current carrying conductor

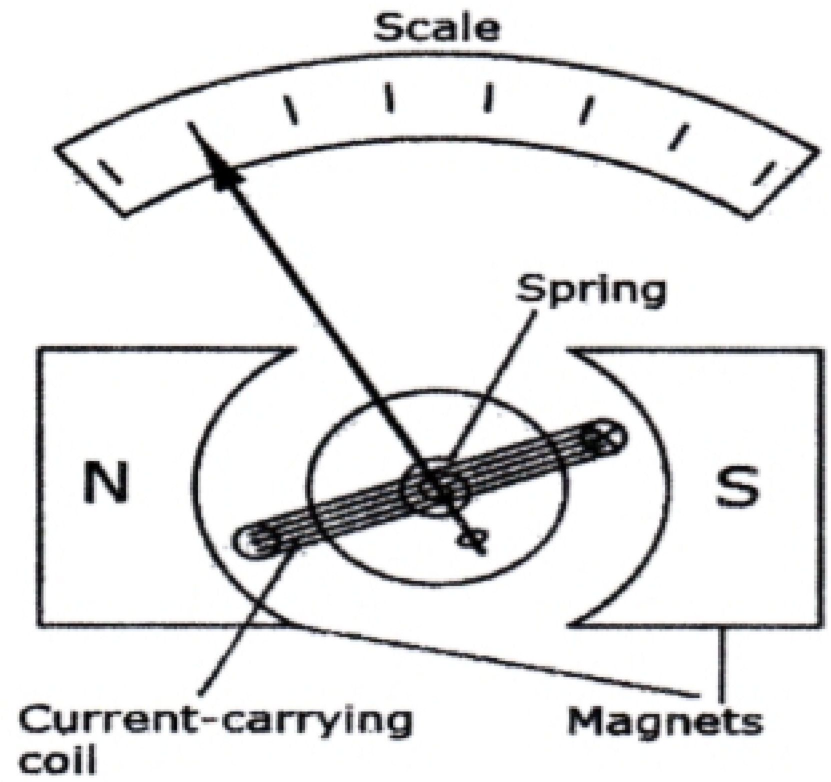


(ii) Due to a current carrying solenoid

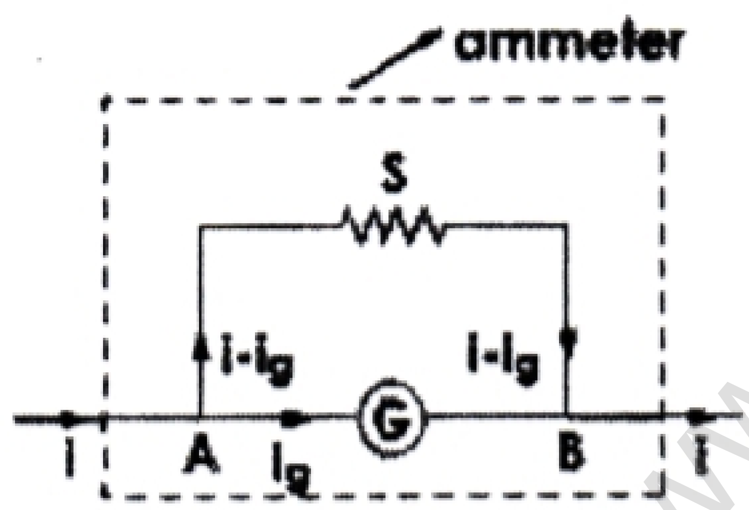


3. (i) Schematic diagram of a Cyclotron (ii) Schematic diagram of a Moving Coil Galvanometer



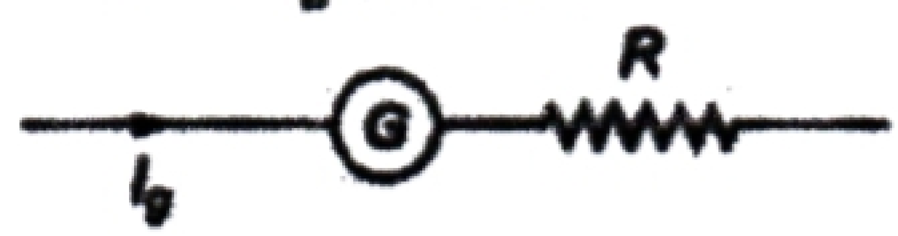


4. Conversion of Galvanometer
(i) Into ammeter



(ii) into voltmeter

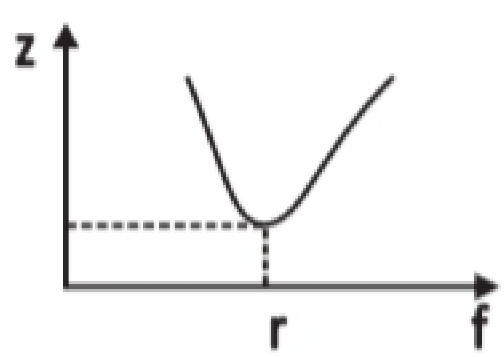
$$V = I_g (G + R)$$

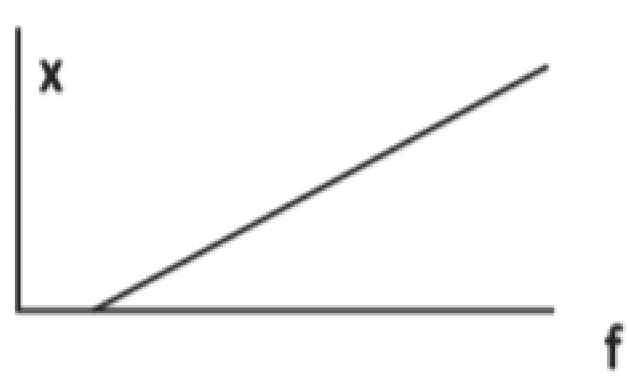


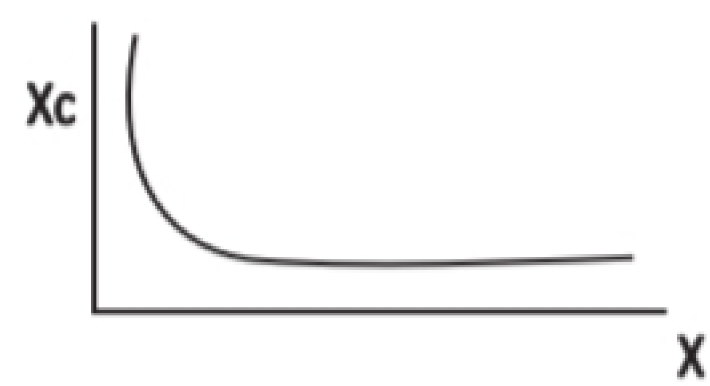
$$R = \frac{V}{I_g} - G$$

ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENT

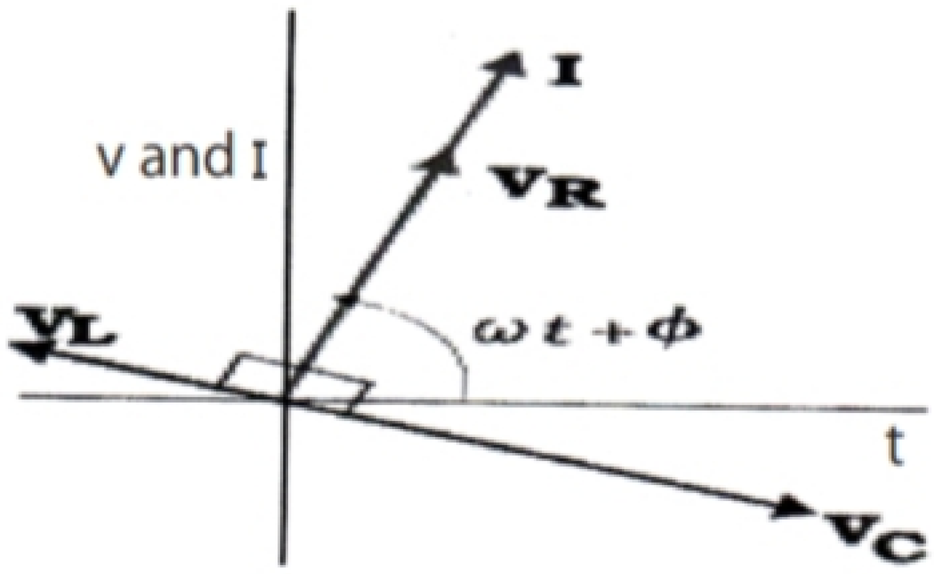
1. Graph Showing Variation of Impedance of LCR Circut, inductive and capacitive reactance Versus Frequency of A.C respectively



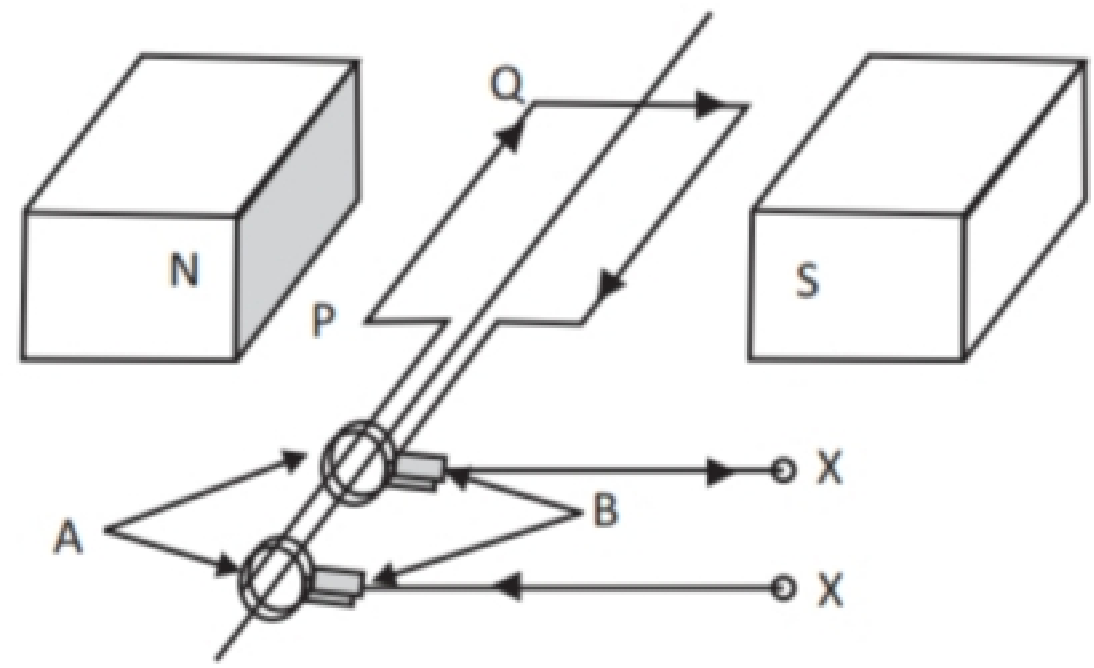




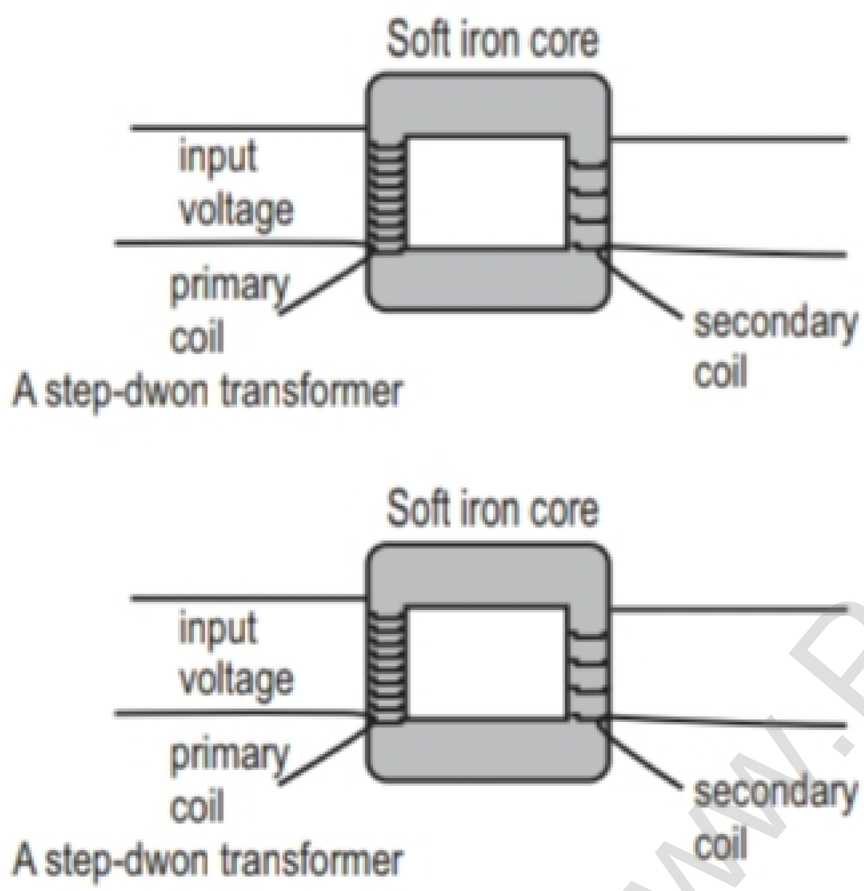
2. (i) Phasor diagram for L-C-R series ciruit



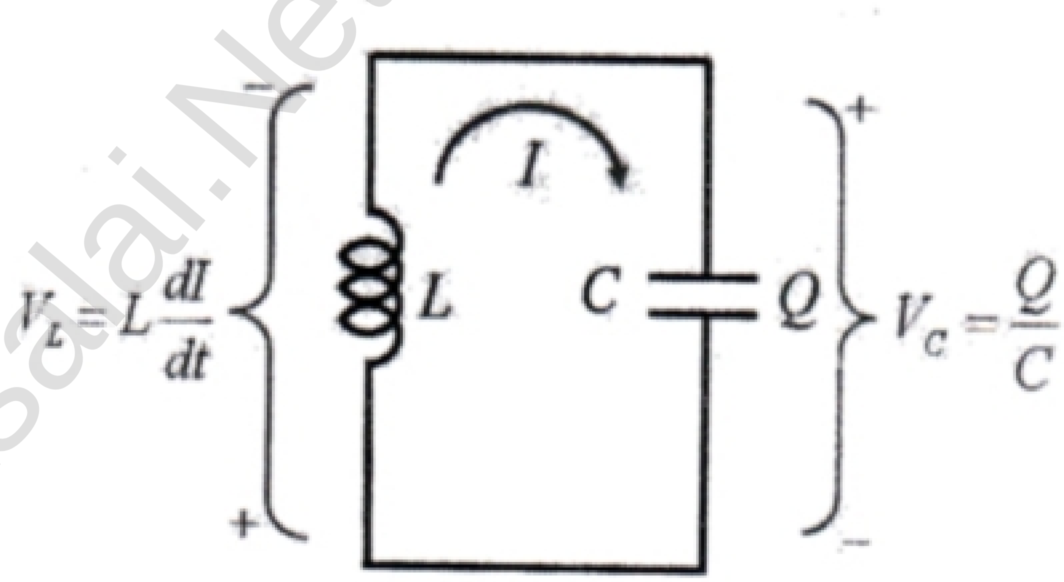
(ii) A.C. Generator



3. (i) Transformer

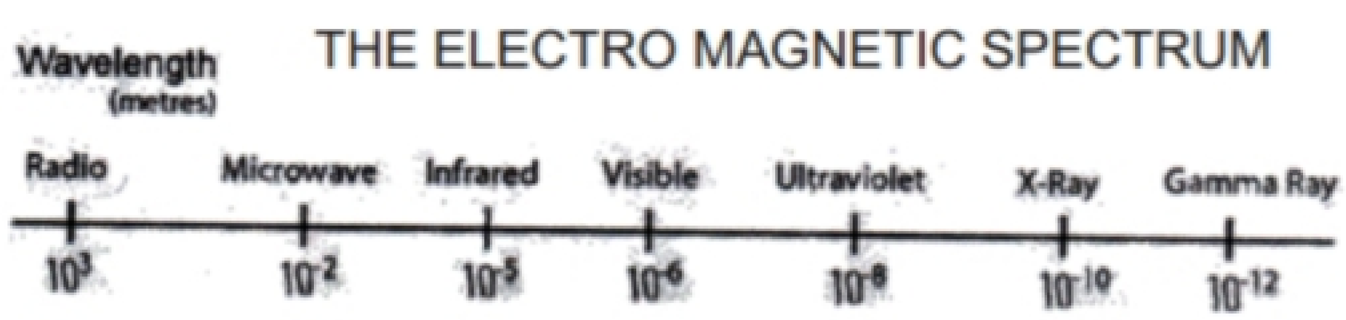


(ii) L-C Oscillation



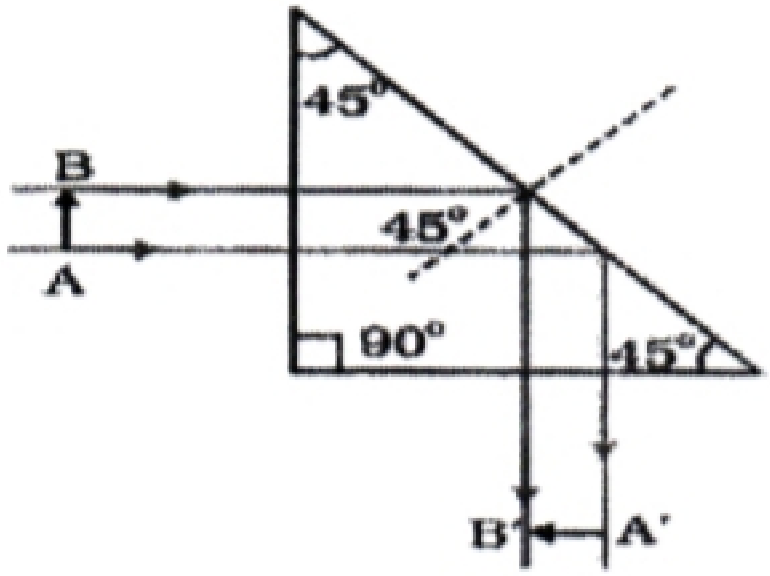
ELECTROMAGNETIC WAVE

Type	Wavelength
Radio	> 0.1 m
Microwave	0.1m to mm
Infra-red	1mm to 700nm
Light	700 nm to 400 nm
Utravolet	400 nm to 1 nm
X-rays	1 nm to 10^{3} nm
Gamma rays	< 10^{-3} nm

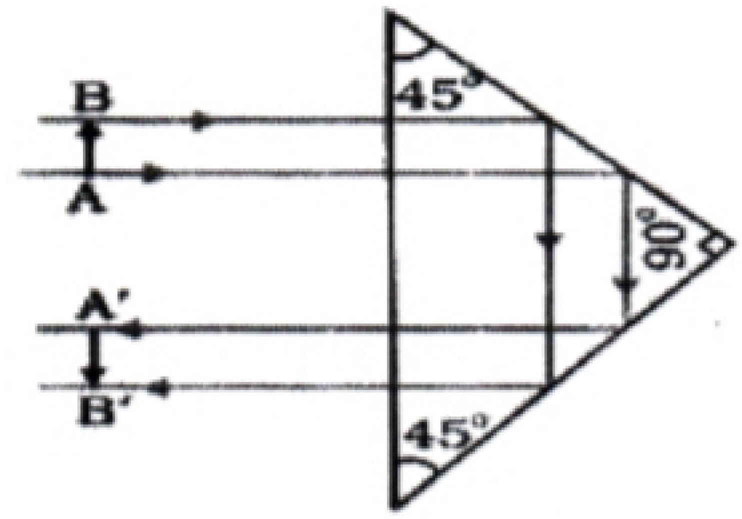


RAY OPTICS

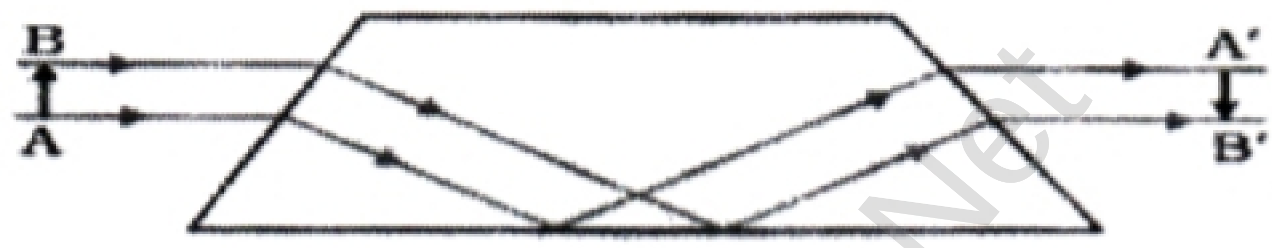
(i) Prisms designed to bend rays by 90^0 or to invert image without changing it size make use of total internal reflection



(a)

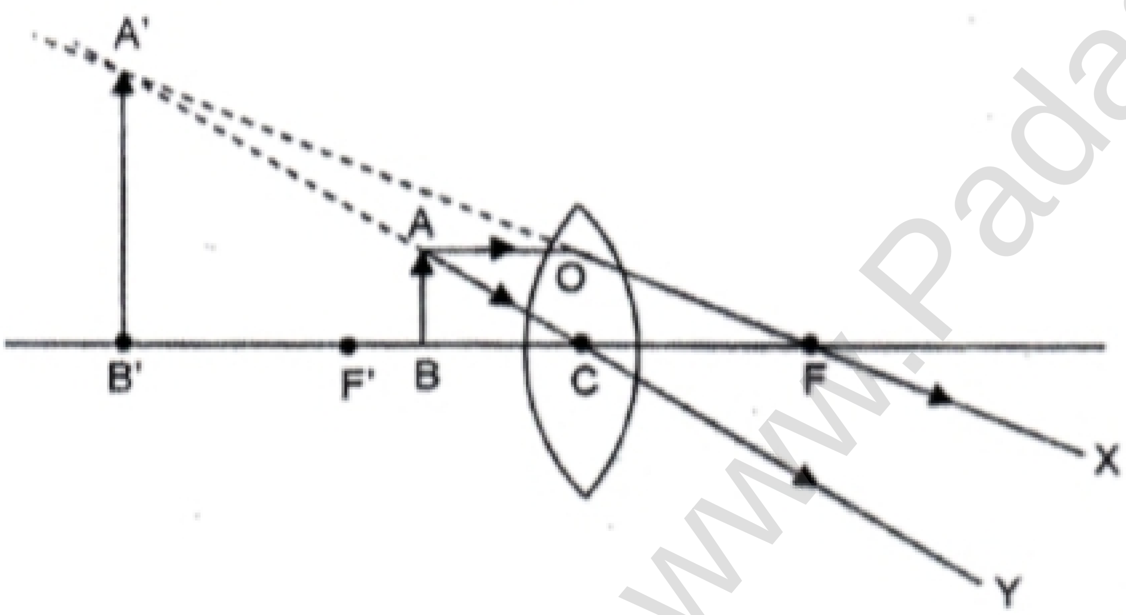


(b)

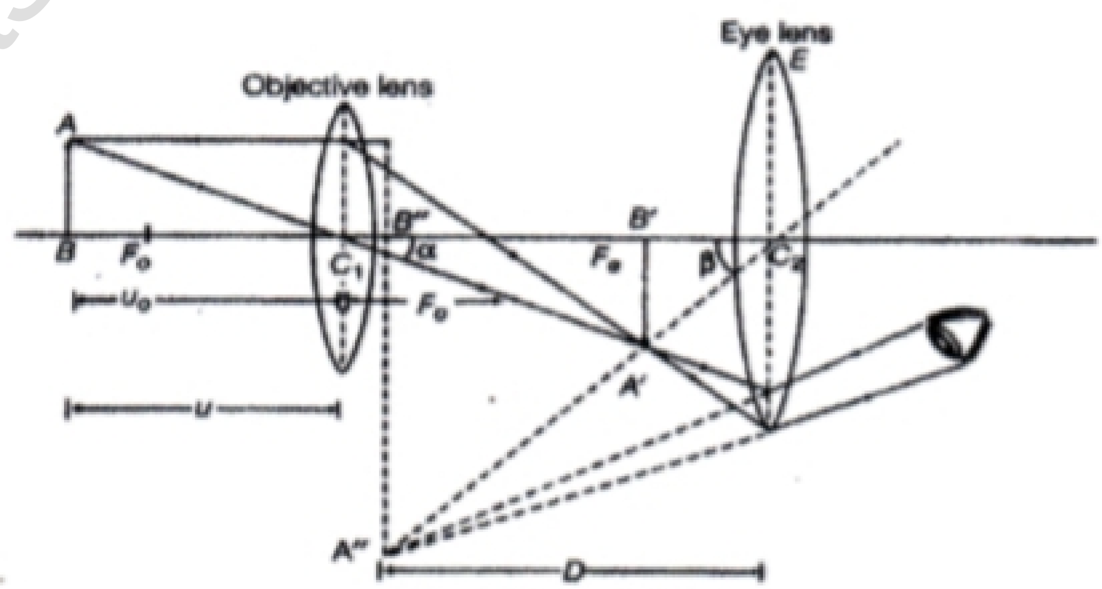


(c)

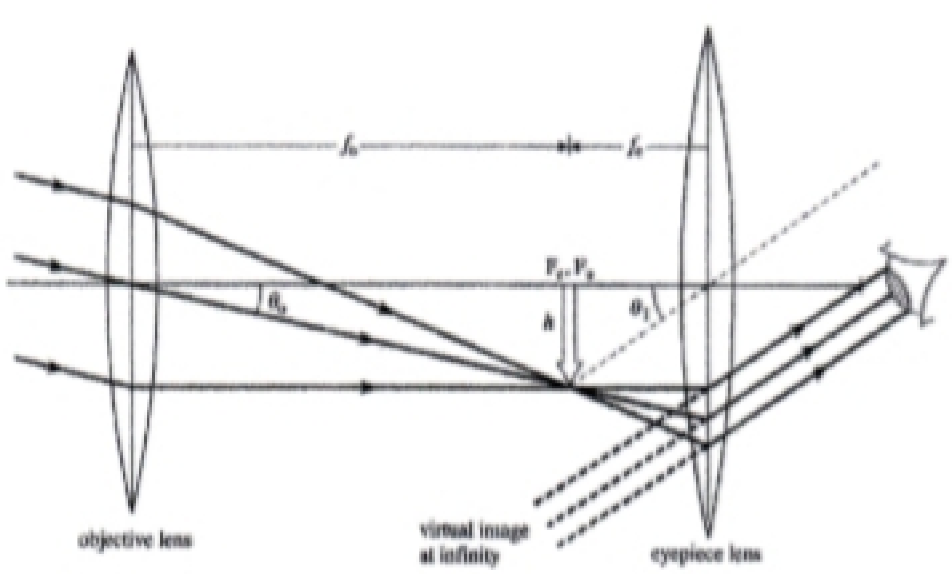
(iii) Simple microscope



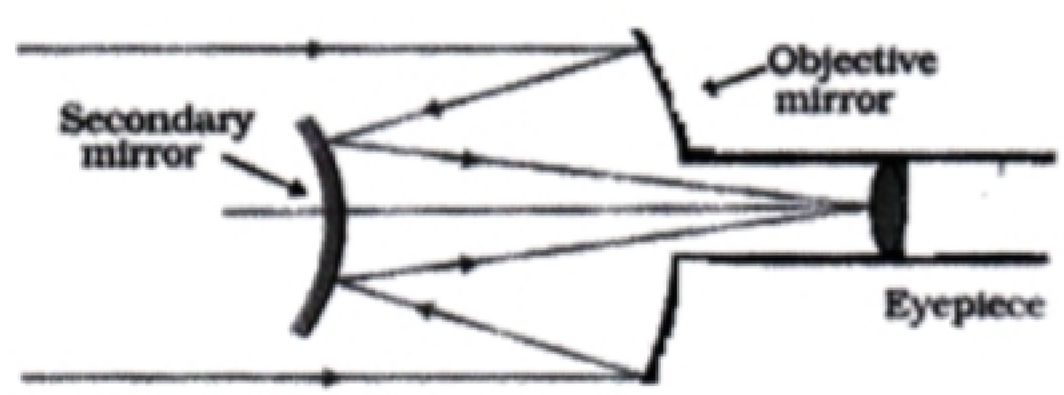
(iv) Compound microscope



(v) Ray diagram for refracting telescope.

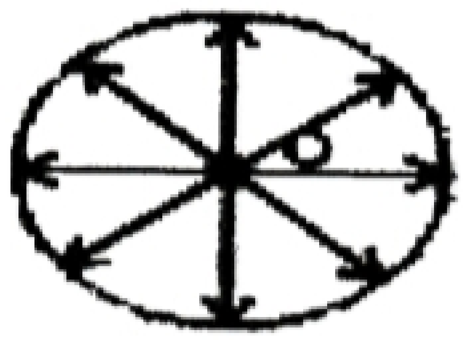


(iv) A reflecting telescope.

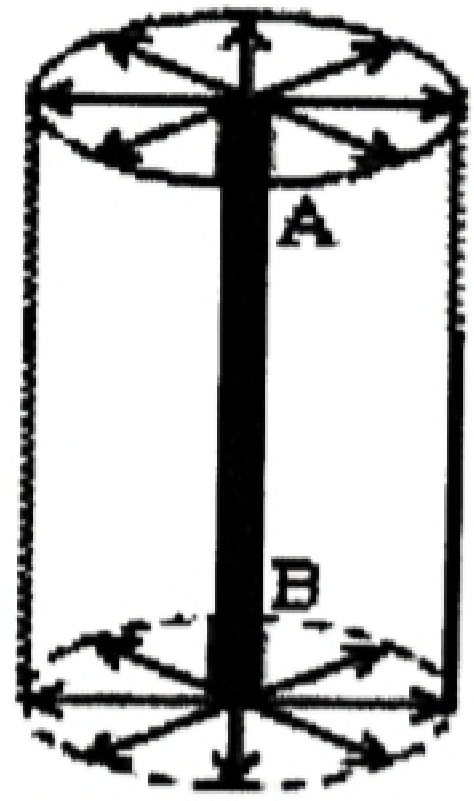


WAVE OPTICS

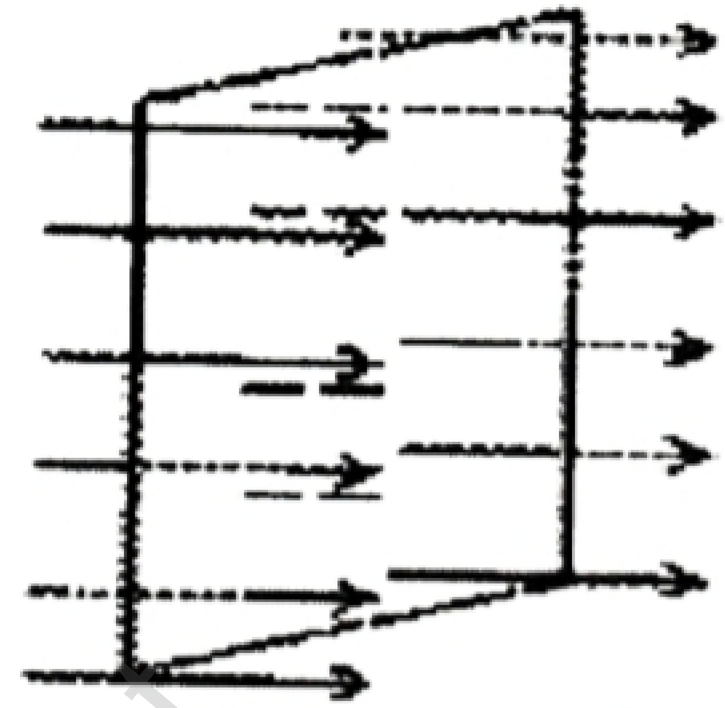
(i) Shapes of wave front



Point Source

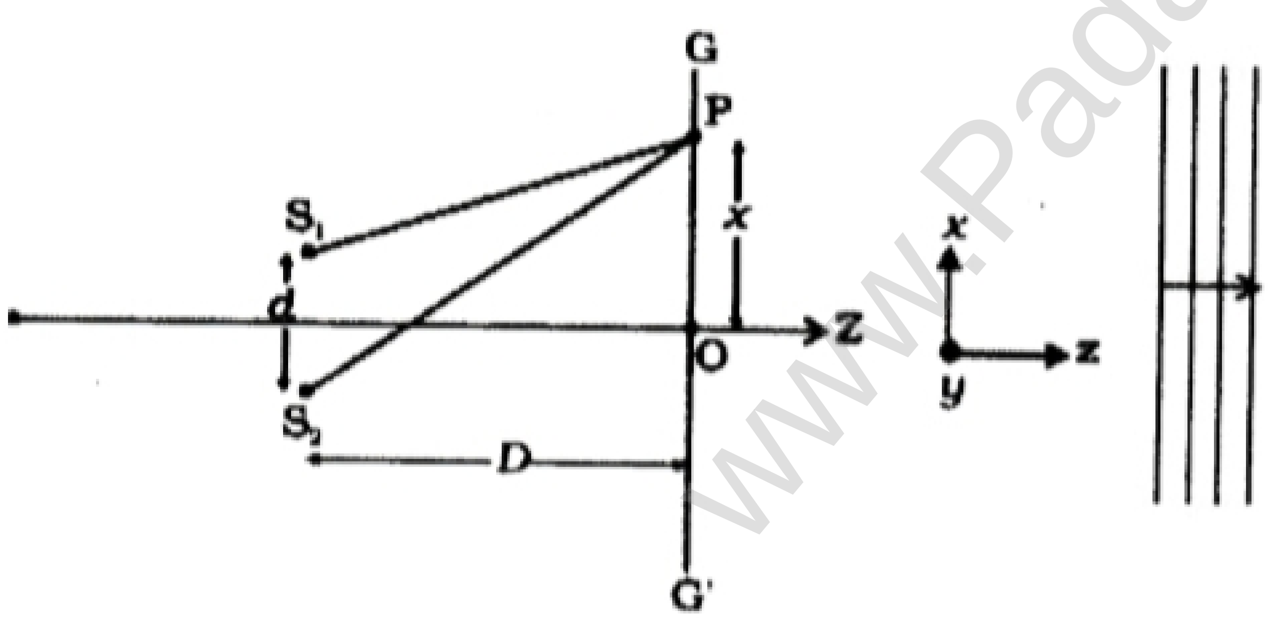


Line Source

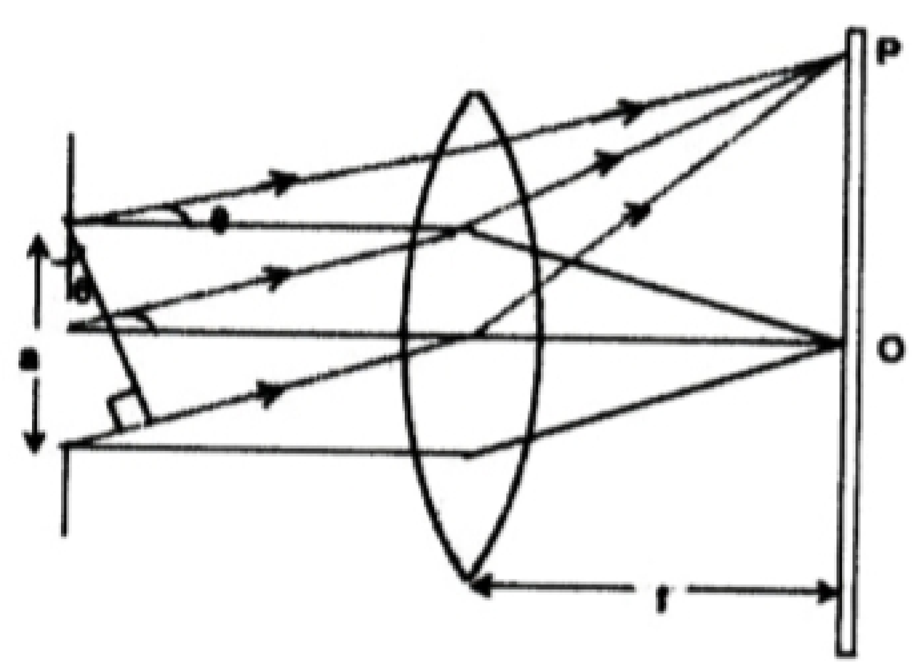


Source at infinity

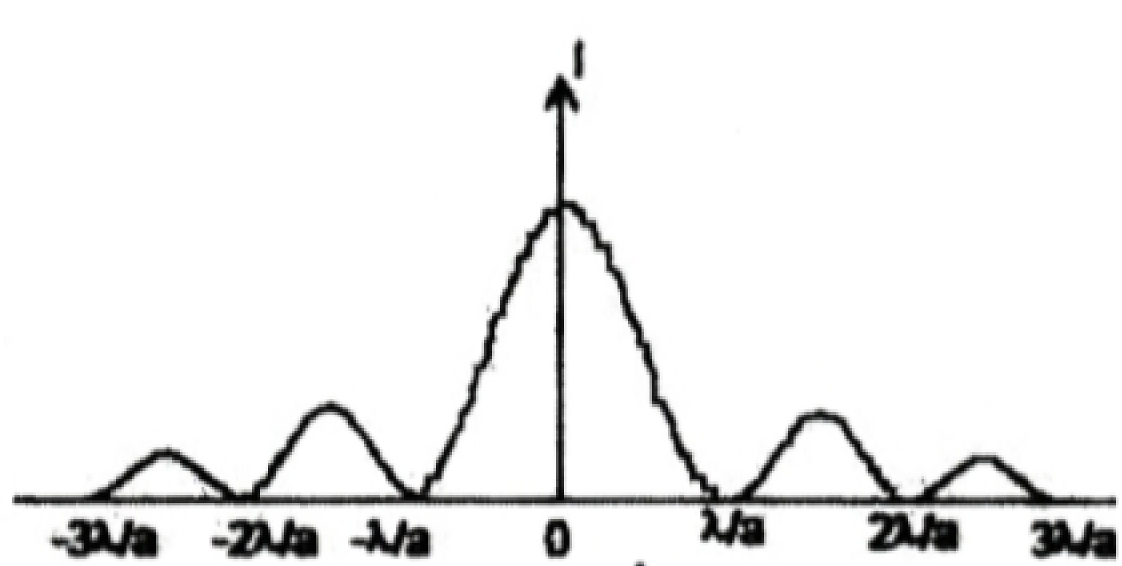
(ii) Youngs double slit experiment



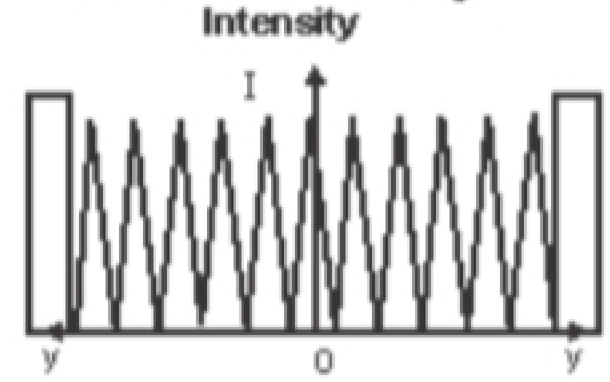
(iii) Single slit diffraction



(v) Intensity distribution in single slit diffraction



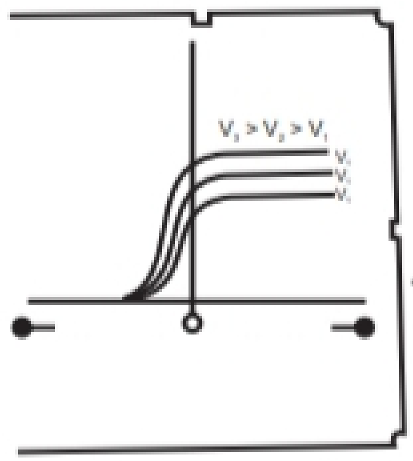
Distribution of Intensity :
Intensity

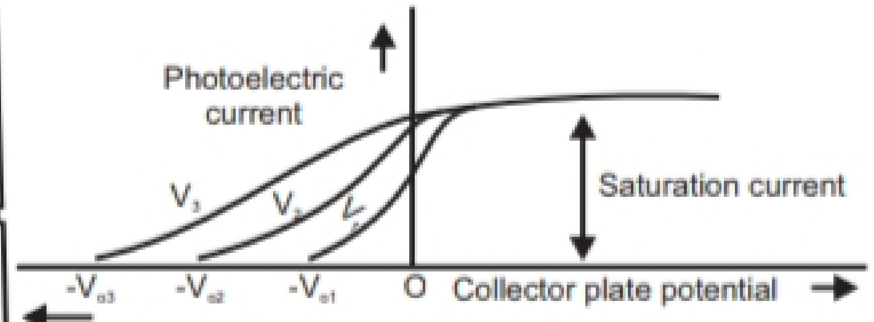


Condition for sustained interference.

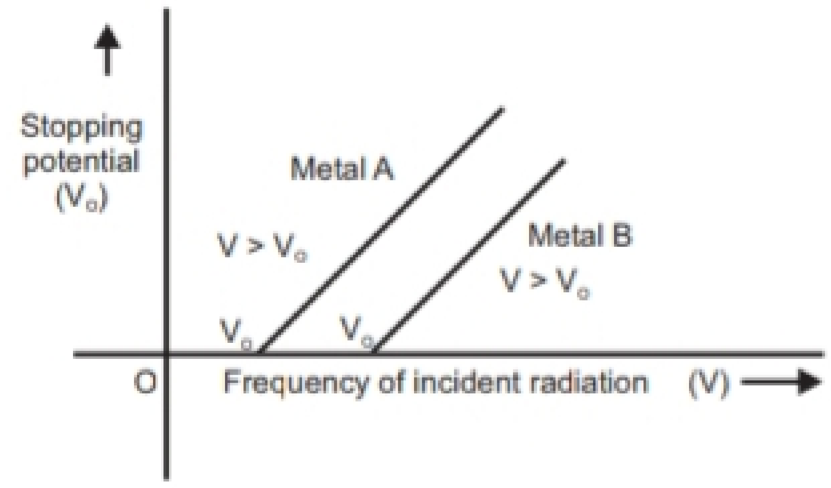
7. DUAL NATURE OF MATTER & RADIATION

EXPERIMENTAL STUDY OF PHOTOELECTRIC EFFECT

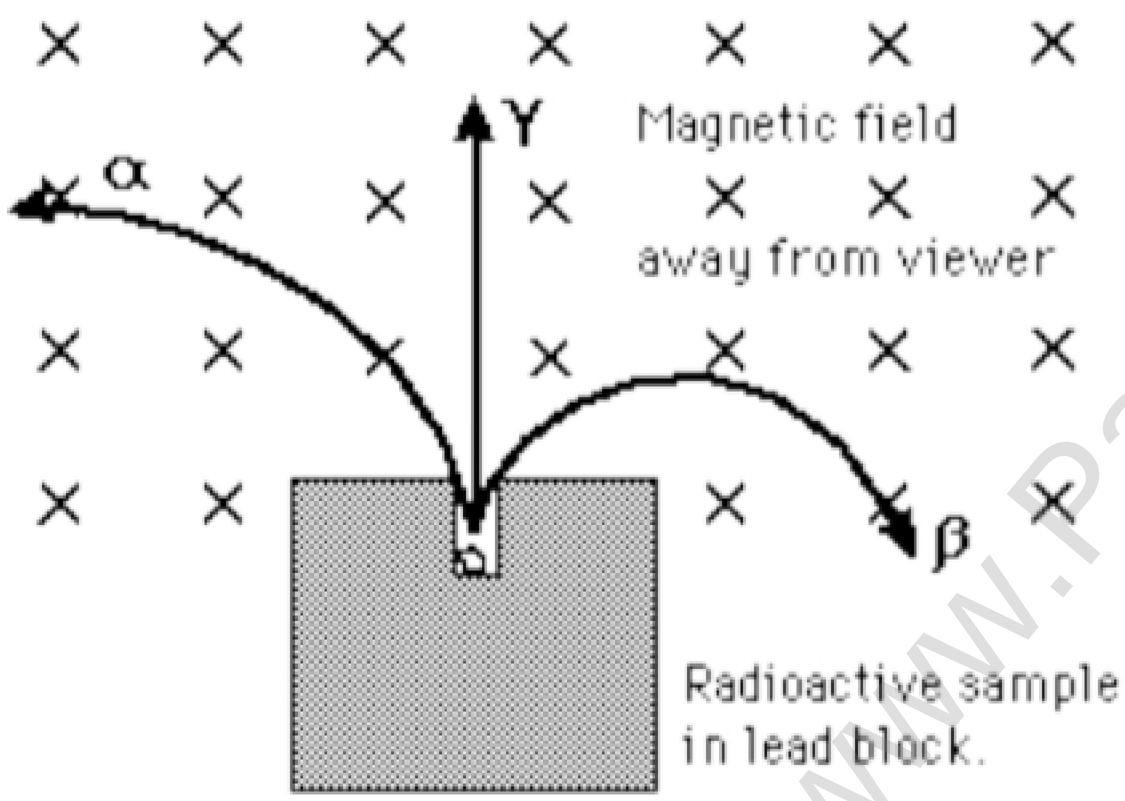


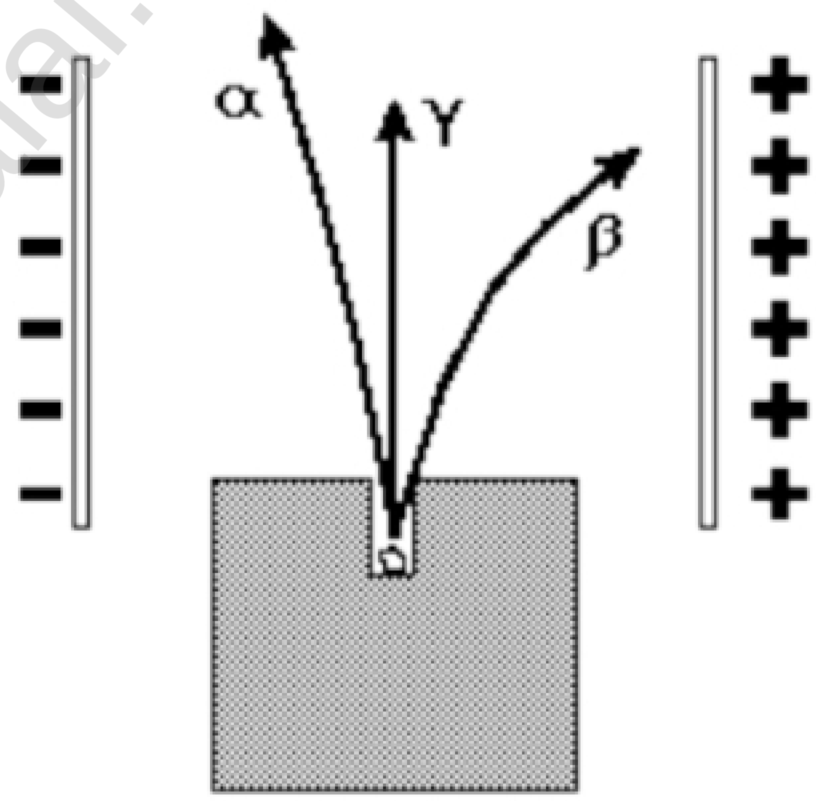


Variation of photoelectric current with collector plate potential for different frequencics of incident radiaton.



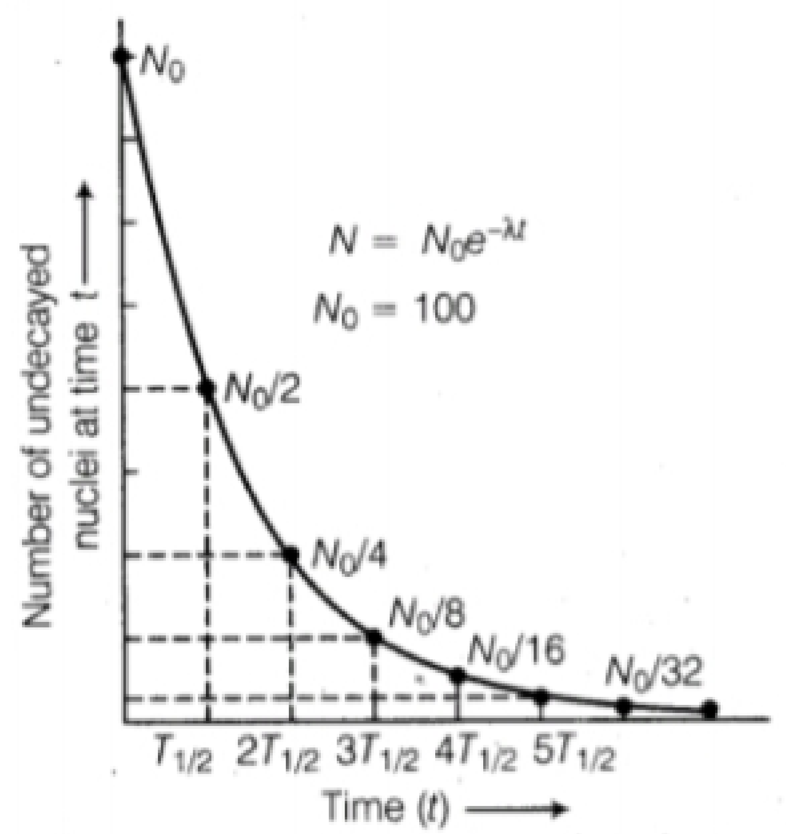
ATOM & NUCLEI



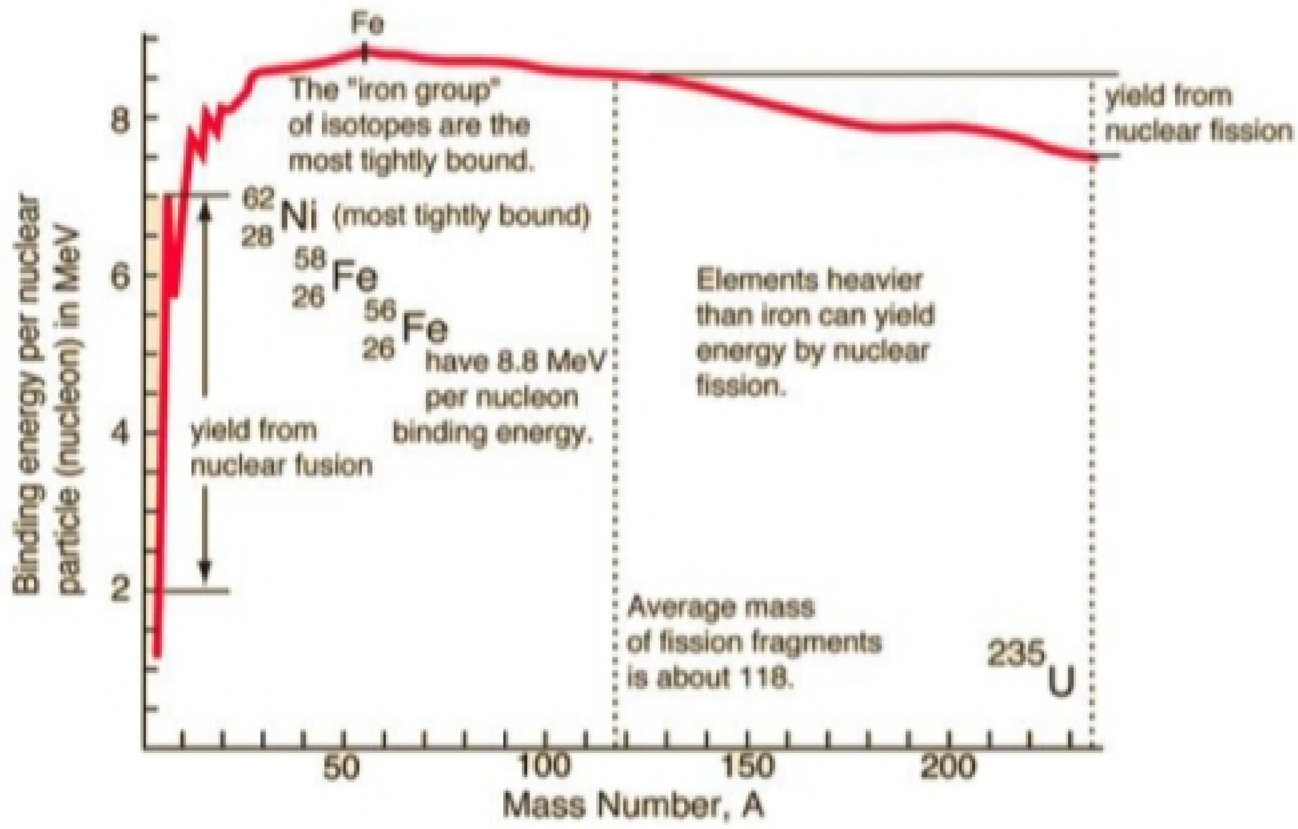


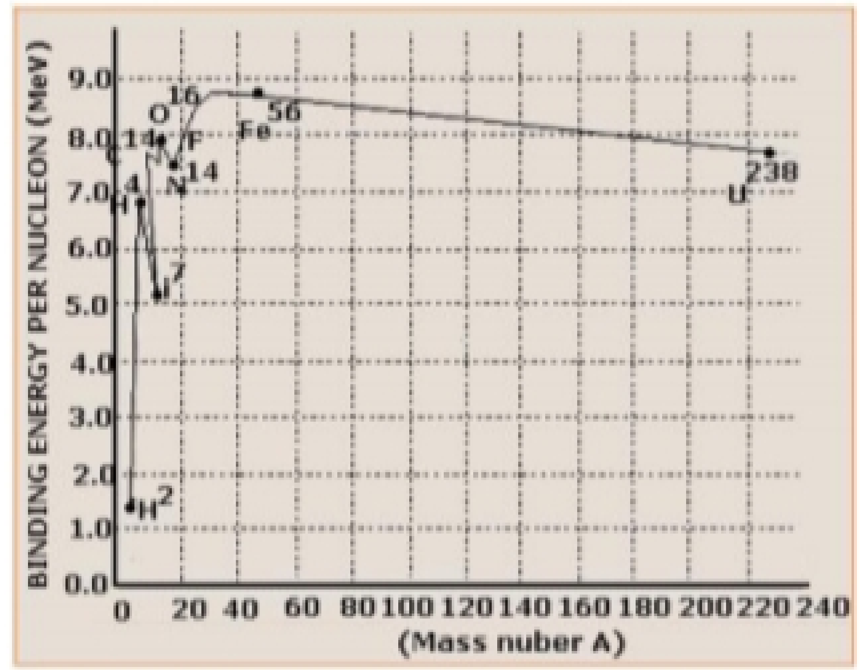
Radioactive sample decay

The curve representing the law of radioactive decay is shown as below:

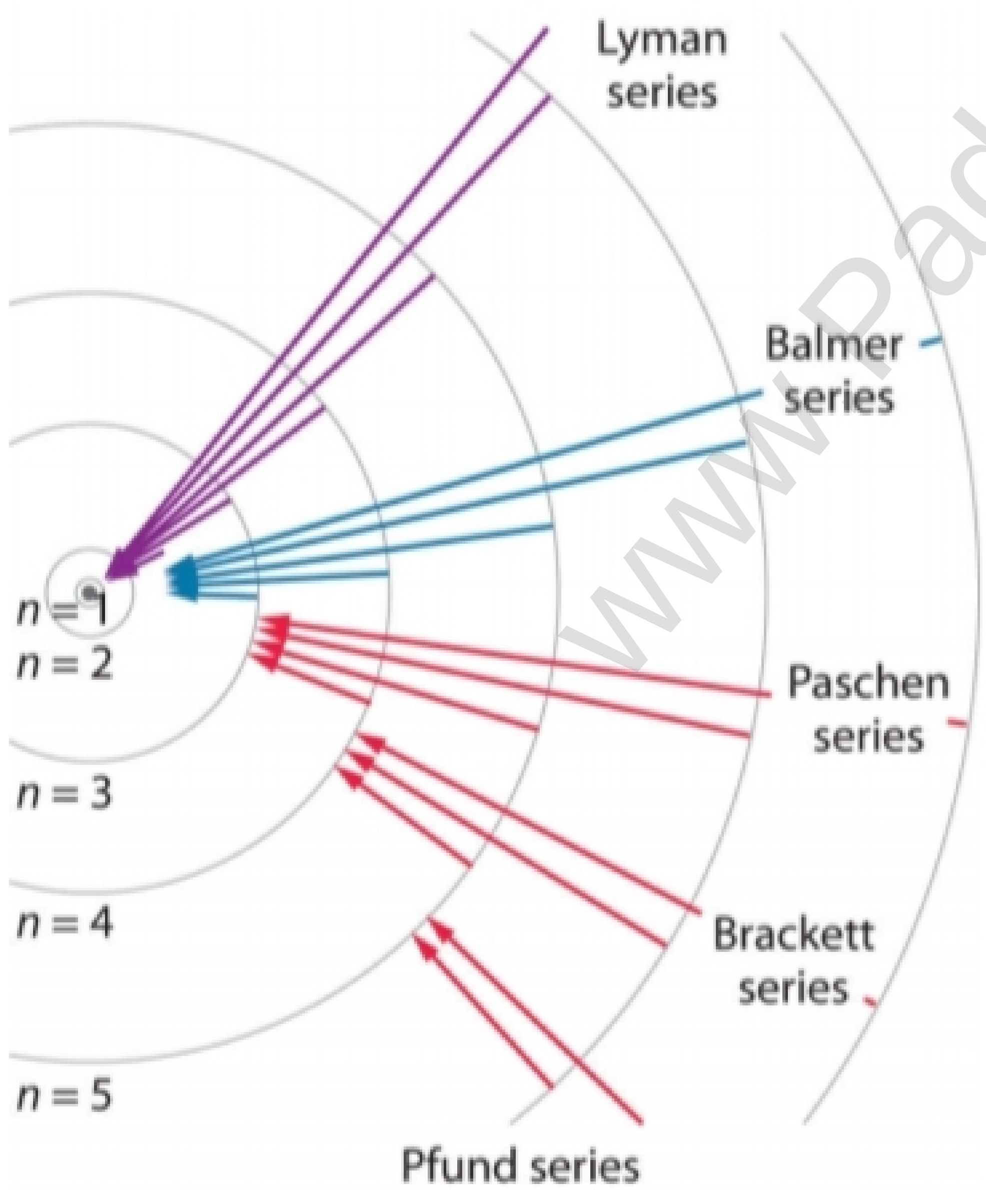


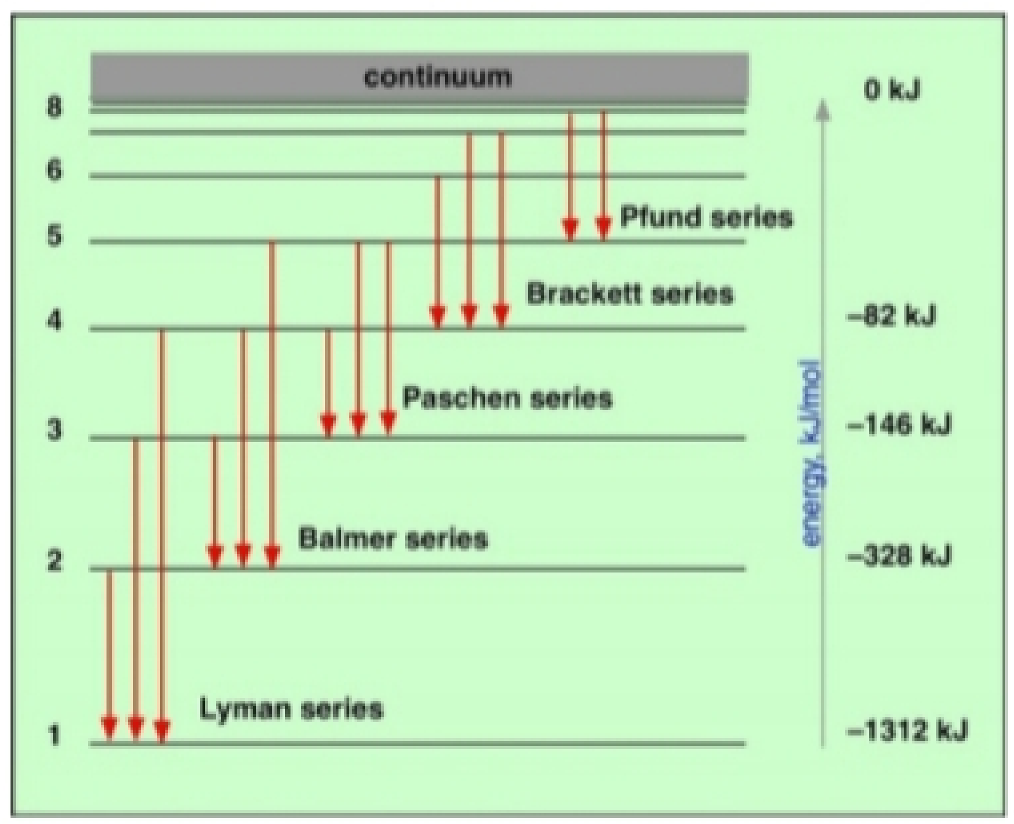
Decay curve for a radioactive element (1)





Binding Energy per Nucleon Curve

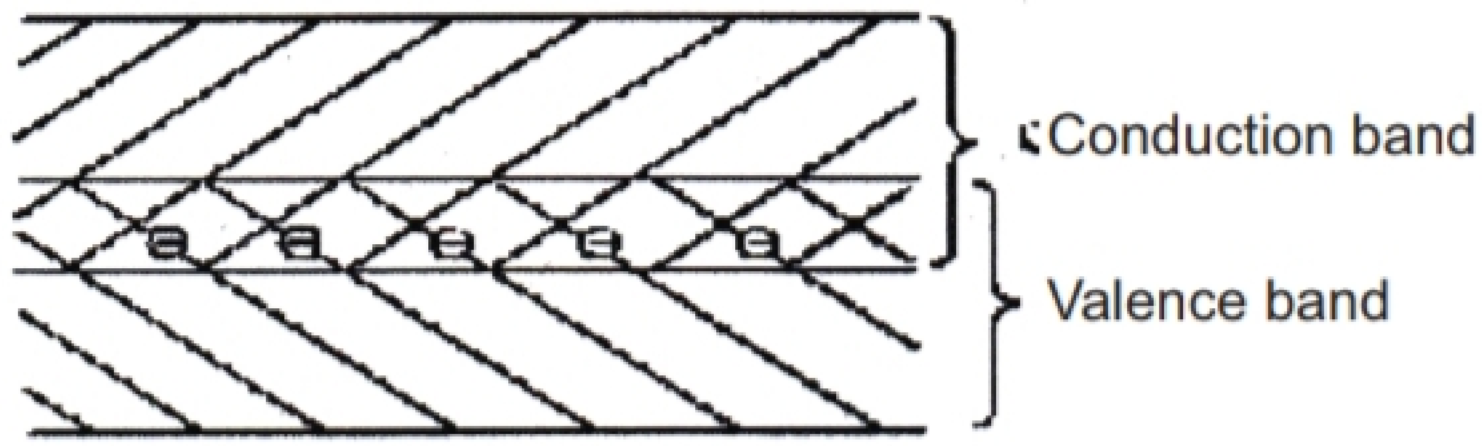


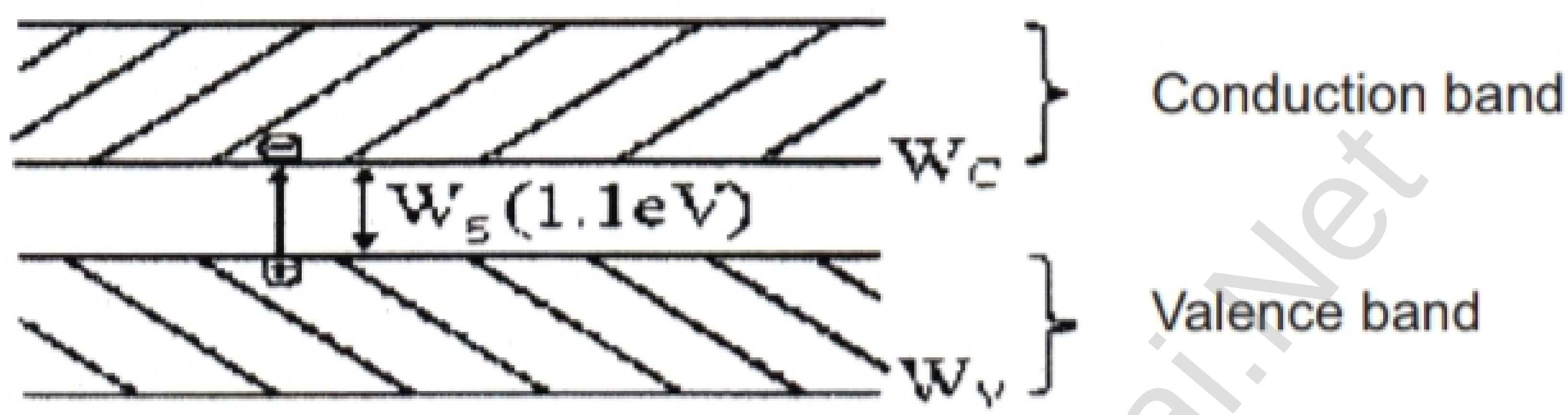


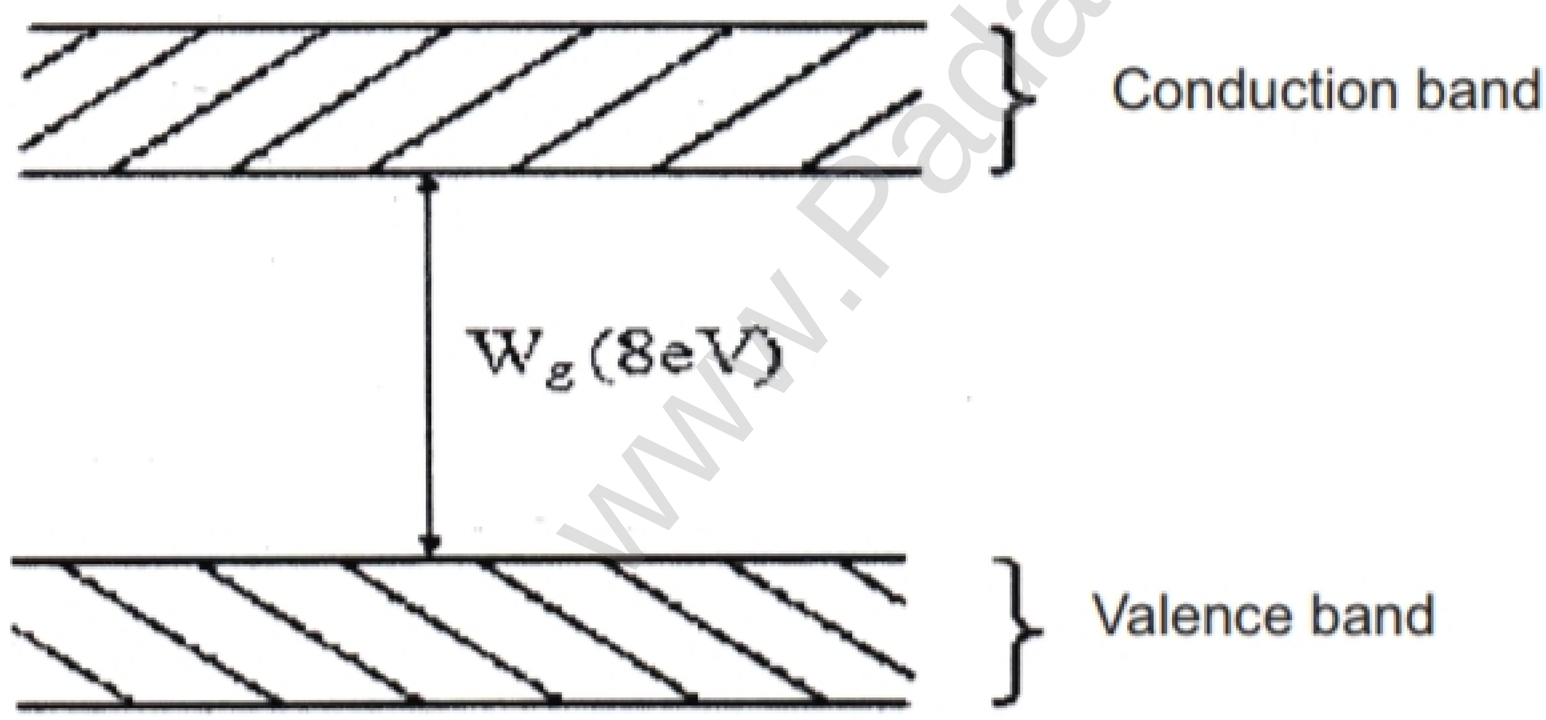
Hydrogen Atom Spectral Lines

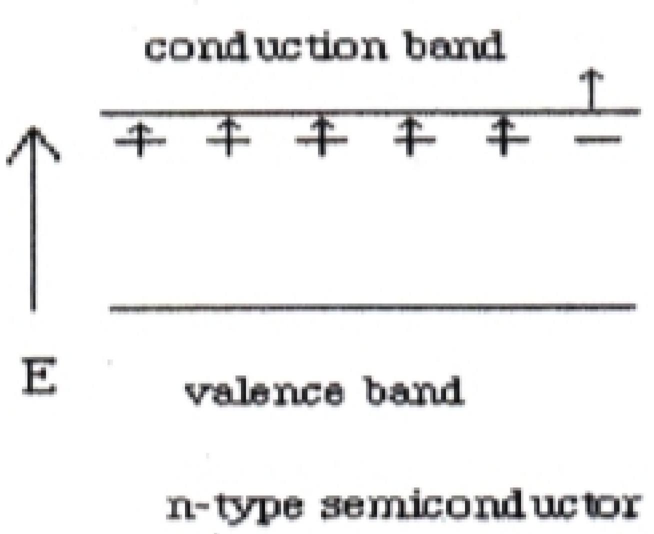
SEMICONDUCTOR DEVICES

1. Energy band diagram : (a) fro metal (b) for Semiconductor (c) for Insulator (d) N type Semiconductor (e) P Type Semiconductor

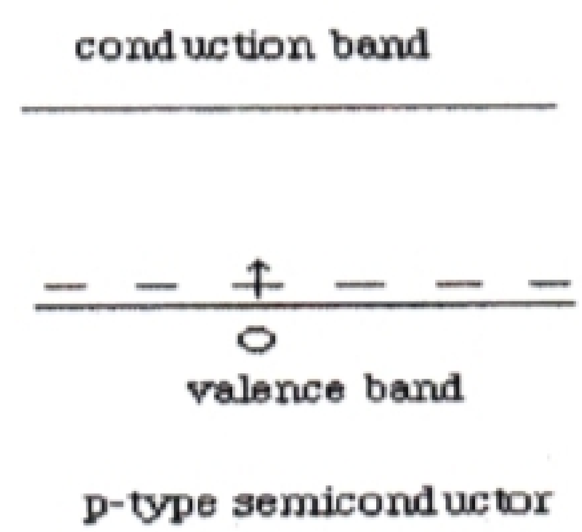






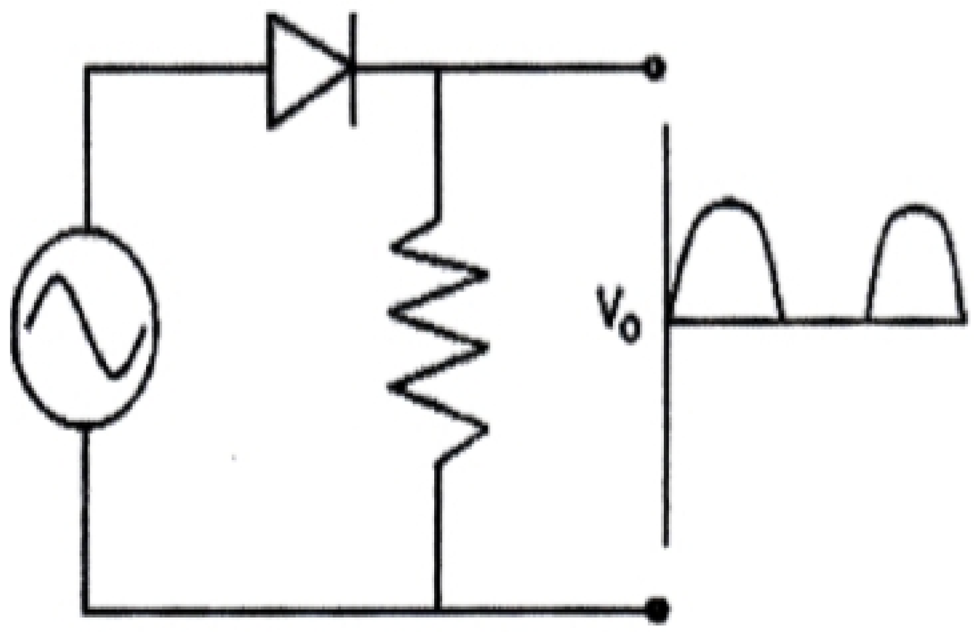


(d)

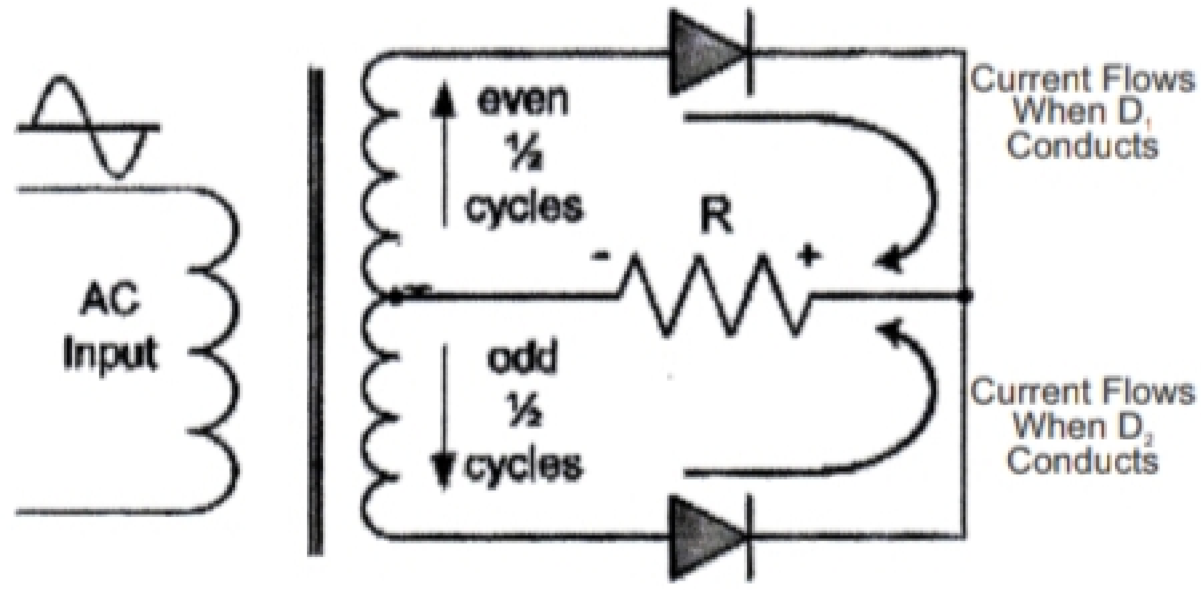


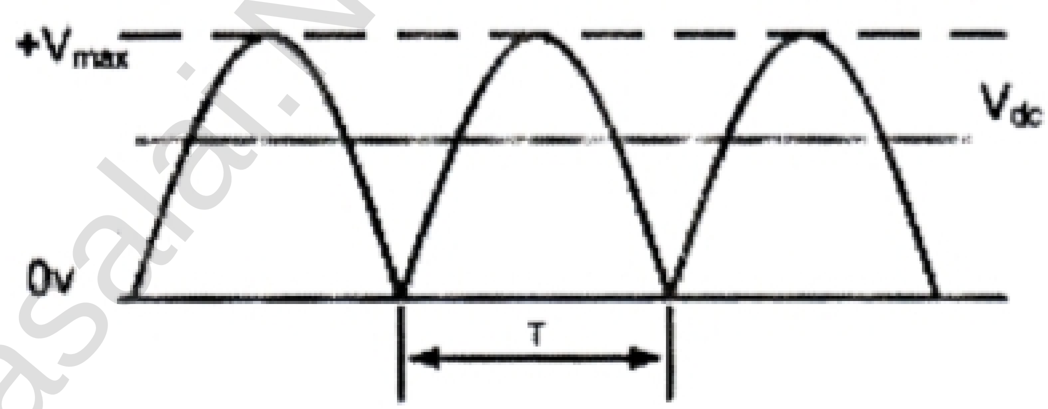
(e)

2. (i) Circuit for half wave rectifier



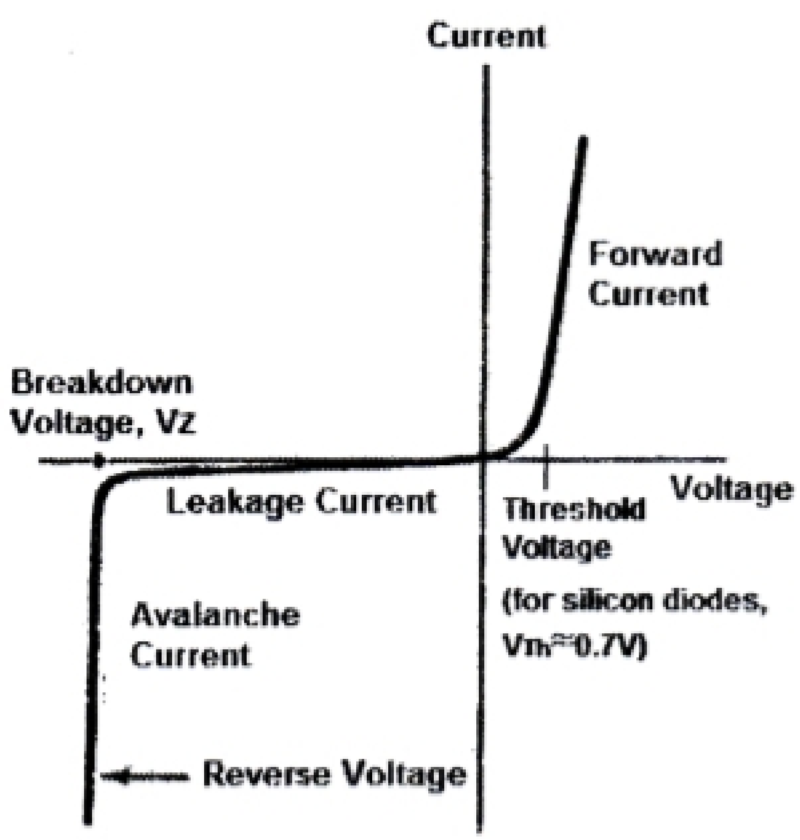
(ii) Circuit diagram full wave rectifier



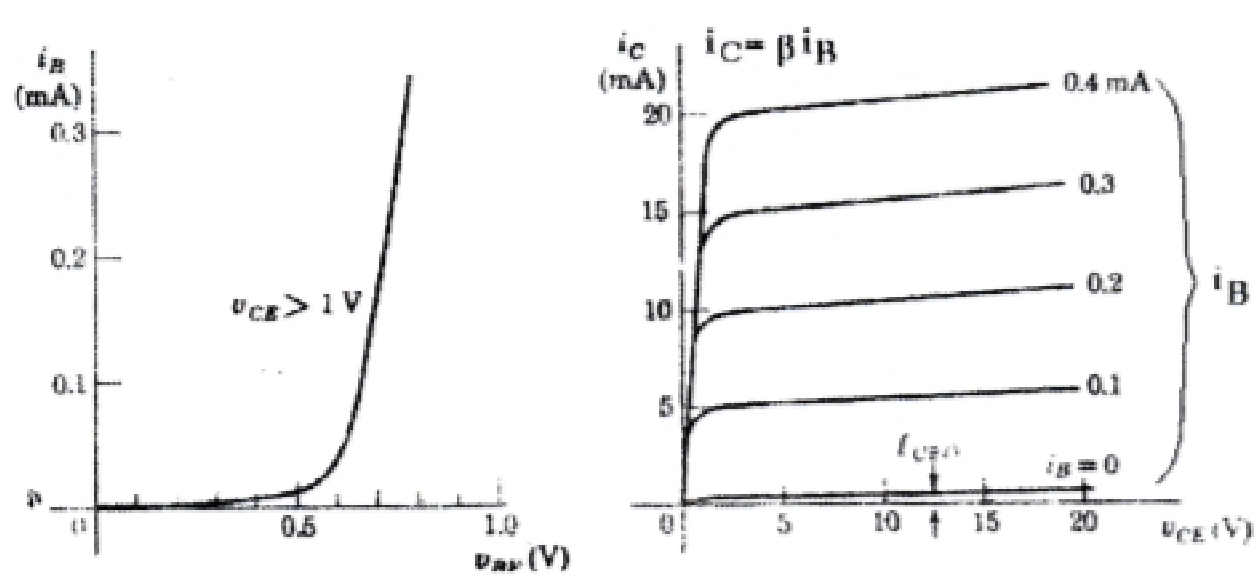


Resultant Output Waveform

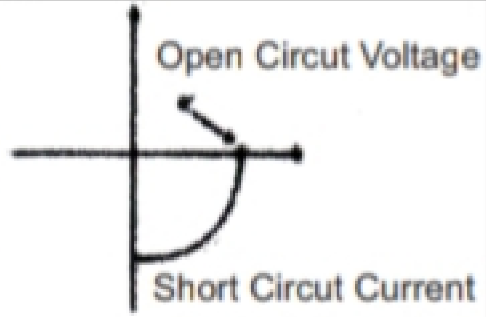
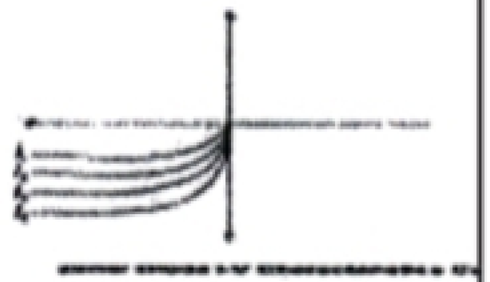
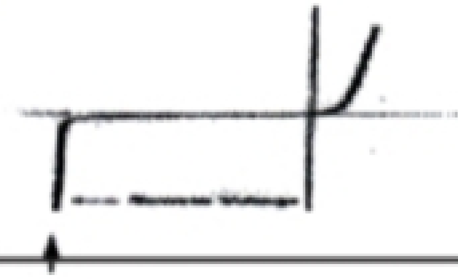
3. (i) Diode characteristic curve



(ii) Input and Output characteristics curve for NPN Transistor (CE)



Special type of diodes

Solar cell	It is a diode with either p or n side made thin to allow light energy falling on it to convert in to electrical energy. Material used for preparing are si and GaAs	To produce solar power in satellites, space vehicles , Small Electronic Devices (External biasing Not Required)	
Photo diode	It is made from photosensitive material with provision to allow light of suitable frequency to fall at the junction (Reverse biased)	Used ad fire alarm, detector circuit	
Zener diode	It is specially designed to work on reverse bias breakdown region	Used as voltage regulator	
Light emitting diode (LED)	It has two leads longer lead is p side and shorter is n side; due to recombination of holes and electrons at the junction energy is released at the junction in the form of light. (Forward biased)	Used as voltage regulator