RUBAGA GIRLS' SCHOOL PHYSICS DEPARTMENT

A simplified approach to ordinary level terms, laws and formulas

MECHANICS

SN	QUANTITY	DEFINITION	S.I UNIT
1	Density	Is the mass per unit volume of a substance	kgm^{-3}
2	Relative density	Is the ratio of density of a substance to the density of water	No unit
3	Cohesion	Is the force of attraction between molecules of the same substance	
4	Adhesion	Is the force of attraction between molecules of different substance	
5	Diffusion	Is the spreading or movement of molecules in fluid from a region of higher concentration to a region of lower concentration	
6	Brownian motion	Is the constant random motion of particles of a gas due to collision with invisible air molecules	
7	Force	Is a pull or push that changes the body's state of rest or uniform motion	$newton\ (N)$
8	Newton	Is the force required to give a mass of 1kg an acceleration of $1ms^{-2}$	
9	Acceleration due to gravity	Is the constant rate of change of velocity with time for a body falling freely under the force of gravity	ms^{-2}
10	Mass	Is the quantity of matter a body contains	$kilogram(kg)$
11	Weight	Is the measure of gravitation force exerted on the body	$newton\ (N)$
12	Friction	Is the force that opposes relative motion of objects in contact	$newton\ (N)$
13	Static friction	Is the friction force between two surfaces that are not sliding over each other	$newton\ (N)$
14	Limiting friction	Is the friction force between two surfaces that are on point of sliding over each other	$newton\ (N)$
15	Kinetic or dynamic friction	Is the friction force between two surfaces that are moving relative to each other	$newton\ (N)$
16	Scalar quantity	Is a physical quantity with only magnitude (size)	
17	Vector quantity	Is a physical quantity with both magnitude and direction	
18	Resultant force	Is a single force that has the same effect as two or forces	$newton\ (N)$
19	Moment of force	Is the product of force and perpendicular distance of the line of the force from the pivot	Nm
20	Couple	Refers to two equal and opposite parallel forces whose lines of action do not intersect	

SN	QUANTITY	DEFINITION	S.I UNIT
21	Centre of gravity	Is the point of application of the resultant due to the earth's attraction on the body	
22	Work	Is the product of force applied to the body and distance through which the body moves in the direction of force	$joule(J)$
23	Joule	Is the work done when a force of one Newton acts on a body and moves it through a distance of 1m in direction of force	
24	Power	Is the rate of doing work	$watt(W)$
25	Energy	Is the ability to do work	$joule(J)$
26	Potential energy	Is the energy possessed by a body due to its position	$joule(J)$
27	Kinetic energy	Is the energy possessed by a body in motion	$joule(J)$
28	Mechanical advantage	Is the ratio of load to effort	$no\ unit$
29	Velocity ratio	Is the ratio of distance moved by the effort to the distance moved by the load	$no\ unit$
30	Efficiency	Is the ratio of work output to work input	$percent(\%)$
31	Pressure	Is the force acting normally per unit area	$pa\ or\ Nm^{-2}$
32	Terminal velocity	Is the constant rate of change of displacement with time for a body falling through a fluid	ms^{-1}
33	Speed	Is the rate of change of distance with time	ms^{-1}
34	Displacement	Is the distance moved in a specified direction	m
35	Velocity	Is the rate of change of displacement with time	ms^{-1}
36	Uniform velocity	Is the constant rate of change of displacement with time	ms^{-1}
37	Acceleration	Is the rate of change of velocity with time	ms^{-2}
38	Uniform acceleration	Is the constant rate of change of velocity with time	ms^{-2}
39	Inertia	Is the tendency of a body to remain in its state of rest or uniform motion in a straight line	
40	Momentum	Is the product of mass and velocity of a body	$kgms^{-1}$
41	Impulse	Is the change in momentum of a body or is the time effect of the force	Ns
42	Elasticity	Is the ability of a body to recover its original shape and size after deformation	
43	Stress	Is the force per unit area of cross section	Nm^{-2}
44	Strain	Is the change in length per unit original length	$no\ unit$
45	Young's modulus	Is the ratio of stress to strain	Nm^{-2}
46	Tie	Is a girder under tension	
47	Strut	Is a girder under compression	

LIGHT

SN	QUANTITY	DEFINITION	S.I UNIT
1	Reflection	Is the change in direction of light after hitting a plane reflecting surface	
2	Regular reflection	Is one in which an incident parallel beam is reflected as a parallel beam	
3	Irregular reflection (diffuse reflection)	Is one in which an incident parallel beam is not reflected as a parallel beam	
3	Principal axis	Is the line joining the pole to the centre of curvature	
4	Principle focus (focal point)	This the point on the principal axis to which all rays that are originally parallel and close to it converge or diverge after reflection	
5	Principle focus of a concave mirror	This the point on the principal axis to which all rays that are originally parallel and close to it converge after reflection	
6	Principle focus of a convex mirror	This the point on the principal axis to which all rays that are originally parallel and close to it diverge after reflection	
7	Focal length f of a mirror	Is the distance between the principle focus and the pole of the mirror	
8	Pole of a mirror	It is the centre of the curved mirror	
9	Aperture of a mirror	This is the width of the curved mirror	
10	Radius of curvature	It is the distance between the centre of curvature and the pole	
11	Centre of curvature	Is the centre of the sphere of which the curved mirror forms part.	
12	Magnification (m)	Is the ratio of image height to object height	*no unit*
13	Refraction	Is the change in direction of light ray when it travels from one medium to another	
14	Refractive index(n)	Is the ratio of angle sine of angle incidence to the sine of angle of refraction for a given pair of media	
15	Total internal reflection	Is the phenomenon that occurs within the same medium when a light ray travels from a dense medium to a less dense medium at an angle of incidence greater than the critical angle	
16	Critical angle (c)	Is the angle of incidence for which the angle of refraction is 90^0 when a ray of light passes from an optically denser medium to a less dense medium	
17	Pole of a lens	This is the centre point of the surface of a lens on either side.	
18	Optical centre	This is the centre between the poles of the lens at which the principal axis	
19	Aperture of a lens	This is the width of the lens from one edge to the other.	
20	Principal axis	This is a line which passes through the centres of curvature of the curved surfaces which make up the lens.	

SN	QUANTITY	DEFINITION	S.I UNIT
17	Principle focus or focal point of a lens	Is the point on the principal axis at which all rays originally parallel and close to the principal axis converge or from which they diverge after passing through the lens.	
18	Principle focus of a convex lens	Is the point on the principal axis at which all rays originally parallel and close to the principal axis converge after passing through the lens.	
19	Principle focus of a concave lens	Is the point on the principal axis at which all rays originally parallel and close to the principal axis from which they diverge after passing through the lens.	
20	Focal length f of a lens	Is the distance between the principle focus and the optical centre of the lens	
21	Power of a lens	Is the reciprocal of the length in meters	$Diopter(D)$
22	Diopter	Is the power of a lens of focal length of one meter	
23	Accommodation	Is the automatic adjustment of the eye to focus the image of an object by altering the focal length of the lens	
24	Dispersion	Is the separation of white light into its constituent colours by a glass prism	
25	Primary colours	Are colours which cannot be made by mixing any other colours of light together	
26	Secondary colours	Are colours which are obtained by mixing two primary colours	
27	Complementary colours	Is a pair of colours (primary and secondary) which when mixed make up white light	

HEAT

SN	QUANTITY	DEFINITION	S.I UNIT
1	Linear expansivity	Is the increase in length of a unit length of a material for a degree rise in temperature	
2	Lower fixed point	Is the temperature of pure melting ice at standard atmospheric pressure	
3	Upper fixed point	Is the temperature of steam from pure water boiling under standard atmospheric pressure	
4	Absolute temperature	Is the temperature at which a gas occupies zero volume	
5	Heat capacity	Is the quantity of heat required to raise the temperature of a body by $1k$	Jk^{-1}
6	Specific heat capacity	Is the quantity of heat required to raise the temperature of $1kg$ mass of body by $1k$	$Jkg^{-1}k^{-1}$
7	Latent heat	Is the amount of heat absorbed or released by a substance to change from one state to another at a constant temperature	
8	Specific latent heat	Is the quantity of heat required to change $1kg$ of a substance from one state to another at a constant temperature	
9	Specific latent heat of fusion	Is the quantity of heat required to change $1kg$ of solid into liquid state at constant temperature	
10	Specific latent heat of	Is the quantity of heat required to change $1kg$ of a	

		liquid into vapour state at constant temperature	
11	Evaporation	Is a gradual change of state from liquid to gas that occurs at the surface of a liquid	
12	Saturated vapour	Is one that is in dynamic equilibrium with its own liquid	
13	Unsaturated vapour	Is one which is not in dynamic equilibrium with its liquid	
14	Saturated vapour pressure	Is the pressure of a vapour which is in equilibrium with its own liquid	
15	Conduction	Is the transfer of heat from region of high temperature to region of low temperature without movement of matter as a whole	
16	Convection	Is the transfer of heat through fluids	
17	Radiation	Is the transfer of heat by electromagnetic waves	
18	Heat	Is a form of energy in process of transfer from region of high temperature to region of low temperature	
19	Temperature	Is a number on a chosen scale that expresses the degree of hotness or coldness of a substance	

ELECTROSTATICS

SN	QUANTITY	DEFINITION	S.I UNIT
1	Electrostatics	Electrostatics is the study of force between stationary charged bodies.	
2	Conductor	Is a solid substance which conducts heat and electricity	
3	Insulator	Is a solid substance which is a poor conductor of heat and electricity	
4	Electric field	Is a region around an electric charge where the electric force is experienced	
5	Charge density	This is the amount of charges over the surface per unit area surrounding that point.	
6	Lightning	This is a large discharge between clouds and the earth or between electric charges in the atmosphere and the earth.	

MAGNETISM

SN	QUANTITY	DEFINITION	S.I UNIT
1	Magnetism	Is a force exerted by a magnetic field	
2	Ferromagnetic materials	Is a material that is strongly attracted by a magnet	
3	Paramagnetic materials	Is a material that is weakly attracted by a magnet	
4	Hard magnetic material	Is a material that takes long to retain magnetism and does not easily get demagnetised	
5	Soft magnetic material	Is a material that is easily magnetized and easily demagnetised	
6	Magnetic field	Is the region around a magnet where a magnetic force is experienced	
7	Magnetic meridian	Is a vertical plane passing through the axis of a freely suspended magnetic needle	
8	Geographic meridian	Is a vertical plane passing through the axis of	

SN	QUANTITY	DEFINITION	S.I UNIT
		rotation of the earth	
9	Angle of declination	Is the angle between magnetic meridian and geographic meridian at that place	
10	Angle of inclination(dip)	Is the angle between the earth's horizontal and the direction of the magnetic field at a particular place	
11	Neutral point	Is a point in a magnetic field where the resultant magnetic field is zero	

ELECTRICITY

SN	QUANTITY	DEFINITION	S.I UNIT
1	Electric current	Is the rate of flow of charge around a circuit	$ampere(A)$
2	Coulomb	Is the quantity of electric charge which passes any point in an electric circuit in one second when a current of one ampere is flowing.	
3	Potential difference	Is the work done when one coulomb of electricity moves from one point to another	$volts(V)$
4	Electromotive force (e.m.f)	Is the total work done in joules per coulomb conveyed in a circuit where the cell is connected	$volts(V)$
5	Volt	Is the p.d between two points when one joule of work is required to move one coulomb of electricity from one point to another	
6	Resistance	Is the opposition to flow of current through a conductor	$ohm(\Omega)$
7	Ohm	Is the resistance between two points on a conductor when a constant p.d of 1 volt applied produces a current of 1 ampere	
8	Internal resistance	Is the opposition offered by a cell to electric current	$ohm(\Omega)$

WAVES

SN	QUANTITY	DEFINITION	S.I UNIT
1	Wave	Is the disturbance that transfers energy through a medium without causing a permanent displacement of the medium	
2	Electromagnetic wave	Is a mechanism by which energy is conveyed from one place to another without a material medium	
3	Mechanical wave	Is a mechanism by which energy is propagated from one place to another through a material medium	
4	Transverse wave	Is a wave in which the particles of the medium oscillate perpendicular to the direction of the wave	
5	Longitudinal wave	Is a wave in which the particles of the medium oscillate or vibrate parallel to the direction of the wave	
6	Crest	Is a point on the medium which exhibits maximum upward or positive displacement from rest position	
7	Trough	Is a point on the medium which exhibits maximum downward or negative displacement from rest position	
8	Amplitude	Is the maximum displacement of a particle from rest position	
9	Wavelength	Is the length of one complete cycle or the distance between	

		two successive particles in phase	
10	Compression	Is a region where oscillating air molecules are close to each other	
11	Rarefaction	Is a region where the oscillating air molecules are far apart	
12	Frequency	Is the number of vibrations per second or number of cycles per second	$hertz(Hz)$
13	Cycle	Is one complete to and fro motion of a wave	
14	Period	Is the time taken to make one complete cycle	
15	Wave front	Is the front line or surface that joins points of the same phase in a wave travelling through a medium	
15	Constructive interference	Is a type of interference that occurs when two interfering waves have a displacement in the same direction	
16	Destructive interference	Is a type of interference that occurs when two interfering waves have a displacement in the opposite direction	
17	Sound	Is a physical phenomenon that stimulates the sense of hearing	
18	Progressive wave	Is a wave that moves away from its source through a medium and spreads out continuously	
19	Stationary wave	Is a wave pattern formed when two progressive waves of the same frequency travelling in opposite direction combine together	
20	Nodes	Is a point along a vibrating medium that appear to be at rest	
21	Anti-nodes	Is a point that vibrates with maximum amplitude	
22	Harmonic	Is an integer multiple of the fundamental frequency	$hertz(Hz)$
23	Overtone	Is a musical tone whose frequency is a multiple of a fundamental tone or note	$hertz(Hz)$
24	Resonance	Is when one object vibrating at the same natural frequency of a second object forces it into vibration	

ELECTRIC CELLS

SN	QUANTITY	DEFINITION	S.I UNIT
1	kwh	Is the energy supplied at a rate of 1000wtts per hour	
2	Primary cell	Is one in which current is produced as a result of an irreversible chemical change	
3	Secondary cell	Is one that can be charged after it runs down	

ELECTROMAGNETISM

SN	QUANTITY	DEFINITION	S.I UNIT
1	Electric motor	Is a devise that converts electric energy into mechanical energy	
2	Mutual induction	Is the production of an electromotive force in a circuit resulting from a change in current flowing through another circuit to which it is magnetically linked	
3	Self-induction	Is the process by which an electromotive force is induced in a coil when the flux through the coil changes due to alteration of current in the same coil	
4	Rectification	Is the process of converting alternating current to direct current	

MODERN PHYSICS

SN	QUANTITY	DEFINITION	S.I UNIT
1	Atomic number	Is the number of protons in the nucleus of an atom	
2	Mass number	In the total number of protons and neutrons in the nucleus of an atom	
3	Isotopes	Are atoms of the same element with the same atomic number but different mass number	
4	Thermionic emission	Is the process by which electrons are produced from metals by application of heat energy	
5	Photoelectric emission	Is the process by which electrons are produced from metals when electromagnetic radiation of high frequency falls on the surface of a metal	
6	Cathode ray	Is a stream of high speed electrons	
7	X-rays	Are electromagnetic radiations with short wavelength	
8	Radioactivity	Is the spontaneous disintegration of unstable radioactive element with emission of radiations and energy	
9	Alpha particle	Is a high speed helium nucleus	
10	Beta particle	A high speed electron ejected from the nucleus of an atom	
11	Gama ray	Is a high energy electromagnetic radiation emitted from the nucleus of a radioactive atom	
12	Half life	Is the time taken for half the nuclei present to decay	
13	Nuclear fission	Is the splitting of a heavy nucleus into two lighter nuclei with release of energy	
14	Nuclear fusion	Is the combining of two lighter nuclei at high temperature to produce a heavier nucleus with release of energy	

SCIENTIFIC LAWS AND PRINCIPLES

SN	NAME	LAW(S) OR PRINCIPLE
1	Law of floatation	A floating body displaces its own weight of the fluid in which it floats
2	Newton's laws of motion	**Law 1:** Everybody continues in its state of rest or uniform motion in a straight line unless acted upon by an external force **Law 2:** The rate of change of momentum of a body is directly proportional to the applied force and takes place in the direction of the force **Law 3:** To every action there is an equal but opposite reaction
3	Hook's law	The extension produced in an elastic material is directly proportional to the load provided the elastic limit is not exceeded
4	Laws of reflection	**Law 1:** The incident ray, reflected ray and the normal at the point of incidence all lie in the same plane **Law 2:** The angle of incidence is equal to the angle of reflection
5	Laws of refraction	**Law 1:** The incident ray, the refracted ray and the normal at the point of incidence all lie in the same plane **Law 2:** The ratio of sine of angle of incidence to sine of angle of refraction is a constant for a pair of media
6	Boyle's law	The volume of a fixed mass of a gas at constant temperature is inversely proportional to the pressure

7	Charles' law	The volume of a fixed mass of a gas at constant pressure is directly proportional to the absolute temperature
8	Pressure law	The pressure of a fixed mass of a gas at constant volume is directly proportional to absolute temperature
9	Law of electrostatics	Like charges repel while unlike charges attract
10	Law of magnetism	Like poles repel while unlike poles attract
11	Ohm's law	The current through a conductor at constant temperature is directly proportional to the potential difference between its ends
12	Faraday's laws of electromagnetic induction	**Law 1:** Whenever a conductor moves through a magnetic flux or if there's change in magnetic flux linked with a circuit an emf is induced **Law 2:** The magnitude of the induced emf in a circuit is directly proportional to the rate of change of flux linkage
13	Lenz's law	The direction of the induced current is in such a way to oppose the change producing it
14	Principle of moments	When a body is in equilibrium, the sum of clockwise moments about any point is equal to the sum of anticlockwise moments about the same point
15	Principle of simple machines	Is that a small force (effort) moves over a large distance to produce a big force that moves a load over a small distance
16	Principle of work	The work output is less than the work input
17	Pascal's principle	Pressure applied to a liquid is transmitted equally throughout the liquid in all directions
18	Archimedes' principle	When a body is wholly or partially immersed in a fluid, it experiences an up thrust force equal to the weight of the fluid displaced
19	Principle of conservation of momentum	When two or more bodies collide with one another, their total momentum remains constant provided no external forces act on them
20	Principle of reversibility of light	The path of light ray is reversible
21	Principle of conservation of energy	Energy can neither be destroyed nor created but transformed from one state to another
22	Principle of superposition	When two waves interfere, the resulting displacement at any location is the algebraic sum of the displacements of the individual waves at the same location

COMMON FORMULAE

SN	QUANTITY	FORMULA
1	Density	$density = \frac{mass\ of\ the\ body}{volume\ of\ a\ body}$ $\rho = \frac{M}{V}$
2	Relative density	$R.D = \frac{density\ of\ substance}{density\ of\ water}$
3	Weight	$W = mg$
4	Work done	$W.D = Force \times Distance$ $W.D = F \times d$
5	Power	$P = \frac{work\ done}{time\ taken}$ $P = \frac{F \times d}{t}$ $P = \frac{mgd}{t}$
6	Potential energy	$P.E = mgh$
7	Kinetic energy	$K.E = \frac{1}{2}mv^2$
8	Moment	$Moment = Force \times perpendicular\ Distance$
9	Mechanical advantage	$M.A = \frac{Load}{Effort}$ $M.A = \frac{L}{E}$
10	Velocity ratio	$V.R = \frac{effort\ distance}{Load\ distance}$
11	V.R of wheel and axle	$V.R = \frac{R}{r}$ $R = radius\ of\ wheel$ $r = radius\ of\ axle$
12	V.R of gears	$V.R = \frac{Number\ of\ teeth\ in\ the\ driven\ wheel}{Number\ of\ teeth\ in\ the\ driving\ wheel}$ Or $V.R = \frac{speed\ of\ rotation\ of\ the\ drivig\ wheel}{speed\ of\ rotation\ of\ the\ driven\ wheel}$
13	V.R of screw	$V.R = \frac{2\pi L}{Pitch}$
14	Efficiency	$Efficiency = \frac{M.A}{V.R} \times 100\%$
15	Pressure	$P = \frac{F}{A}$
16	Pressure in liquids	$P = \rho h g$
17	Gas pressure	$P = H + \rho h g$ or $P = H - \rho h g$
18	Relative density of solid and liquid	$R.D\ of\ solid = \frac{W_a}{W_L - W_a}$ or $R.D\ of\ liquid = \frac{W_a - W_L}{W_a - W_w}$
19	Density of floating body	$Density = fraction\ submerged \times density\ of\ liquid$
20	Floating body	$Weight\ of\ body = weight\ of\ fluid\ dispaced = upthrust$
21	Speed	$Speed = \frac{distance(d)}{time(t)}$
22	Acceleration	$a = \frac{change\ in\ velocity}{time}$ $a = \frac{V - U}{t}$
23	Equations of linear motion	Horizontal motion $v = u + at$ $s = ut + \frac{1}{2}at^2$ $v^2 = u^2 + at^2$ Vertical downward motion $v = u + gt$ $s = ut + \frac{1}{2}gt^2$ $v^2 = u^2 + gt^2$ Vertical upward motion $v = u - gt$ $s = ut - \frac{1}{2}gt^2$ $v^2 = u^2 - gt^2$
24	Momentum	$momentum = mass \times velocity$
25	Force	$Force = mass \times acceleration\ (F = ma)$
26	Impulse	$Impulse = force \times time\ (I = F \times t)$
27	Elastic collision	$m_1 u_1 + m_2 u_2 = m_1 v_1 + m_2 v_2$

28	Inelastic collision	$m_1 u_1 + m_2 u_2 = (m_1 + m_2)v$
29	Gun and bullet	$m_g v_g = m_b v_b$
30	Stress	$stress = \dfrac{force}{area} \; stress = \dfrac{F}{A}$
31	Strain	$strain = \dfrac{extenssion(e)}{original\ length(l_0)}$
32	Magnification	$m = \dfrac{Image\ height(h_I)}{Object\ height(h_0)}$ OR $m = \dfrac{Image\ height(V)}{Object\ height(U)}$
33	Boyle's law	$P_1 V_1 = P_2 V_2$
34	Charles' law	$\dfrac{V_1}{T_1} = \dfrac{V_2}{T_2}$
35	Pressure law	$\dfrac{P_1}{T_1} = \dfrac{P_2}{T_2}$
36	Equation of state	$\dfrac{P_1 V_1}{T_1} = \dfrac{P_2 V_2}{T_2}$
37	Quantity of heat	$H = mc\Delta\theta$
38	At change of state	$H = mL_f \; or \; H = mL_v$
39	Ohm's law	$V = IR$
40	Resistors in series	$R = R_1 + R_2 + R_3 + - - -R_n$ where n is number of resistors
41	Resistors in parallel	$\dfrac{1}{R} = \dfrac{1}{R_1} + \dfrac{1}{R_2} + \dfrac{1}{R_3} + - - - \dfrac{1}{R_n}$ where n is the number of resistors
42	Two resistors in series	$R = R_1 + R_2$
43	Two resistors in parallel	$\dfrac{1}{R} = \dfrac{1}{R_1} + \dfrac{1}{R_2}$
44	Total R for cells in series	$R = nr$ where r is internal resistance
45	Total R for cells in parallel	$R = \dfrac{r}{n}$
46	Period (T)	$T = \dfrac{1}{f}$
47	Frequency (f)	$f = \dfrac{1}{T}$
48	Wave equation	$c = \lambda f$
49	Harmonics in a string	$f = \dfrac{(2n-1)V}{4L}$ where $n = 1,2,3, \ldots$
50	Overtones or harmonics in closed pipes	$f = \dfrac{(2n-1)\lambda}{4L}$ where $n = 1,2,3, \ldots$
51	Speed of wave in a string	$V = \sqrt{\dfrac{T}{\mu}}$
52	Frequency of wave in string	$f = \dfrac{1}{2L}\sqrt{\dfrac{T}{\mu}}$
50	Power	$P = IV \; or \; P = I^2 R \; or \; P = \dfrac{V^2}{R}$
51	Work done	$W = QV \; or \; W = IVt \; or \; W = I^2 Rt \; or \; W = \dfrac{V^2}{R}t$
52	Cost of electricity(shs)	$cost = kwh \times unit\ cost$
53	Efficiency of a motor	$Efficiency = \dfrac{E}{V} \times 100\% \; where \; E - emf, V - voltage$

54	Transformer equation	$\dfrac{V_P}{V_S} = \dfrac{N_P}{N_S}$
55	Power in an ideal transformer	$I_P V_P = I_S V_S$
56	Efficiency of a transformer	$Efficiency = \dfrac{I_S V_S}{I_P V_P} \times 100\%$
57	Decay equation	$M_t = \dfrac{M_0}{2^n}\ \ where\ n = \dfrac{t}{t_{\frac{1}{2}}}$

COMMON EXPERIMENTS IN PHYSICS

NATURE OF MATTER AND FRICTION
1. Experiment to show diffusion in liquid
2. Experiment to show diffusion in gases
3. Experiment to estimate the size of a molecule
4. Experiment to determine the coefficient of friction

MOMENT
5. Experiment to verify the principle of moments
6. Experiment to determine the centre of gravity of an irregular lamina
7. Experiment to determine the mass a uniform meter rule using a standard mass
8. Experiment to determine unknown mass using a standard mass

PRESSURE
9. Experiment to show that pressure in liquids depends on depth
10. Experiment to show that pressure in liquids is transmitted equally throughout the liquid in all directions
11. Experiment to demonstrate atmospheric pressure
12. Experiment to measure atmospheric pressure using a mercury barometer
13. Describe how a hydraulic press works
14. Describe how a lift pump works
15. Describe how a force pump works
16. Describe how hydraulic brake works

ARCHIMEDES' PRINCIPLE AND LAW OF FLOATATION
17. Experiment to verify Archimedes' principle
18. Experiment to measure relative density of a solid
19. Experiment to measure relative density of a liquid
20. Experiment to verify the law of floatation
21. Experiment to verify Hooke's law using a spring

LIGHT
22. Experiment to show rectilinear propagation of light
23. Experiment to show the formation of the umbra using a point source of light
24. Experiment to show the formation of the penumbra using an extended source of light
25. Describe how solar and lunar eclipses are formed
26. Describe how a pinhole camera works
27. Experiment to show the formation of the umbra using a point source of light
28. Experiment to verify the laws of reflection of light

29. Experiment to determine the focal length of a concave mirror
30. Experiment to determine the refractive index of glass using a glass block
31. Experiment to verify Snell's law
32. Experiment to determine the focal length of a convex lens
33. Experiment to determine the refractive index of glass using a triangular prism
34. Describe how a lens camera works
35. Describe how a projector works
36. Describe how dispersion of light occurs in a glass prism
37. Experiment to produce a pure spectrum

HEAT

38. Experiment to investigate the effect of heat on solids
39. Experiment to demonstrate expansion in liquids using water
40. Experiment to compare the expansion of different liquids
41. Experiment to show expansion in gases
42. Experiment to determine the lower fixed point
43. Experiment to determine the upper fixed point
44. Experiment to verify Boyle's law
45. Experiment to verify Charles's law
46. Experiment to verify pressure law
47. Experiment to determine specific heat capacity of a liquid using method of mixtures
48. Experiment to determine specific heat capacity of a liquid using electrical method
49. Experiment to determine specific latent heat of fusion of ice using method of mixtures
50. Experiment to determine specific latent heat of fusion of ice using electric method
51. Experiment to determine specific latent heat of vaporization of water
52. Describe how a refrigerator works
53. Experiment to measure saturated vapour pressure of a liquid
54. Experiment to compare thermal conductivity of solids
55. Experiment to show convection in liquids
56. Experiment to show convection in gases
57. Describe how sea and land breezes occur
58. Experiment to compare radiation of dull and polished surfaces
59. Describe how a vacuum flask works

ELECTROSTATICS

60. Describe how an insulator can be charged by friction
61. Describe how a conductor can be charged positively by induction method
62. Describe how a conductor can be charged negatively by induction method
63. Describe how two conductors can be charged positively by induction method
64. Describe how two conductors can be charged negatively by induction method
65. Draw a well labeled diagram of a gold leaf electroscope
66. Describe how a gold leaf electroscope can be charged positively by induction method
67. Describe how a gold leaf electroscope can be charged negatively by induction method
68. Describe Faraday's ice-pail experiment
69. Describe the action of a lightning conductor

MAGNETISM

70. Describe how a magnet can be magnetized by electrical method, single stroke and double stroke method

CURRENT ELECTRICITY

71. Experiment to verify ohm's law
72. Experiment to determine the internal resistance of a cell

WAVES

73. Experiment to show that sounds waves require a material medium for transmission
74. Experiment to determine the speed of sound using echo method
75. Experiment to verify the laws of vibration in strings
76. Experiment to determine the velocity of sound using resonance method

ELECTRIC CELLS

77. Describe how a simple cell, dry cell and a lead acid accumulator work

ELECTROMAGNETISM

78. Experiment to show the magnetic effect of an electric current using a compass needle
79. Describe the mode of operation of an electric bell, moving coil loud speaker, d.c motor, moving coil galvanometer, d.c generator and a.c generator
80. Describe the mode of operation of a transformer

MODERN PHYSICS

81. Describe how a photocell works
82. Describe how a cathode ray oscilloscope works
83. Describe the mode of operation of an x-ray tube