N. K. PUBLIC SCHOOL

ARYA NAGAR, MURLIPURA, JAIPUR

SUMMER HOLIDAY HOME WORK : 2024-25

CLASS : XI-SCIENCE

Hindi -

- निबन्ध लेखनः– निम्नलिखित निबन्धों में से कोई चार करें–
  - (i) समाचार पत्रों का महत्त्व
  - (ii) वरिष्ठ नागरिकों की समस्याएँ
  - (iii) खुला शौच–मुक्त गाँव
  - (iv) डिजिटल इंडिया
  - (v) लोकतंत्र में मीडिया का उत्तरदायित्व

English-

- Make sentences to indicate all the tenses. (5 sentences each)

Chemistry-

- Atomic structure – Dalton theory, Rutherford Model, definition-Isotope, Isobar, unit conversions.

Mathematics-

- Basic fundamental Identities of trigonometric
- All algebraic identities $(a+b)^2$, $(a-b)^2$, $(a+b)^3$, $(a-b)^3$, (a^2-b^2), (a^3-b^3)
- All operations of set theory. (union, intersection, difference)

Biology-

- Biology practical project work. (Ranthambore National Park)
- NCERT Questions Chapter No. 15 and 16 (Respiration and blood circulatory system)
- Any one Biology working Model-
  - Blood Circulatory System
  - Respiratory System
  - Excretory System
  - Any other biology working model

Physics-

- Chapter-1 'Units and Dimensions' : The following notes to be written in Class Work Note book and learn the table also.

UNITS AND DIMENSIONS

PHYSICAL QUANTITIES: Those quantities which can be measured and can be expressed in number along with units, are called physical quantities. Types : (i)Fundamental (ii)Derived (iii)Supplementary.

FUNDAMENTAL QUANTITIES: Those which do not depend on other quantities (do not have formula). These are seven:

FUNDAMENTAL PHYSICAL QUANTITIES					
S. NO.	NAME	letter used for dimensional formula	UNITS		
			S.I./M.K.S.	C.G.S.	F.P.S.
1	Mass	M	Kilo-gram (kg)	Gram (g)	Pound (lb)
2	Length	L	Meter (m)	cm	Foot (f)
3	Time	T	Second (s)	s	s
4	Temperature	K	Kelvin (K)		
5	Electric current	A	Ampere (A)		
6	Luminous intensity of light	Cd	Candela (Cd)		
7	Quantity of matter	mol	mole		

Numeric prefix				
pico (p)	10^{-12}		deca (da)	10^{+1}
nano (n)	10^{-9}		hect (h)	10^{+2}
micro (μ)	10^{-6}		kilo (k)	10^{+3}
mili (m)	10^{-3}		mega (M)	10^{+6}
centi (c)	10^{-2}		giga (G)	10^{+9}
deci (d)	10^{-1}		tera (T)	10^{+12}

Derived quantities : Those which depend on other quantities (these have formula). These are many:

DIMENSIONAL FORMULAE & UNITS OF DERIVED PHYSICAL QUANTITIES						
S.No.	PHYSICAL QUANTITY	FORMULA/RELATION	DIMENSION	UNIT		
				S.I. / M.K.S.	C.G.S.	CONVERSION
1	*area*	A= *length x breadth*	$L \times L = [M^0L^2T^0]$	m^2	cm^2	$1m^2 = 10^4 cm^2$
2	*volume*	V= *length x breadth x height*	$L \times L \times L = [M^0L^3T^0]$	m^3	cm^3	$1m^3 = 10^6 cm^3$
3	*mass density*	$d \text{ or } \rho = \frac{mass}{volume}$	$\frac{M}{L^3} = [M^1L^{-3}T^0]$	$\frac{kg}{m^3}$	$\frac{g}{cm^3}$	$10^3 \frac{kg}{m^3} = 1 \frac{g}{cm^3}$
4	*frequency*	$f \text{ or } v \text{ or } N = \frac{1}{time\ period(T)}$	$\frac{1}{T} = [M^0L^0T^{-1}]$	s^{-1} or Hz	s^{-1} or Hz	
5	*Speed / velocity*	$v = \frac{distance\ or\ displacement}{time}$	$\frac{L}{T} = [M^0L^1T^{-1}]$	m/s	cm/s	1m/s=100 cm/s
6	*acceleration*	$a = \frac{change\ in\ velocity}{time} = \frac{\Delta v}{\Delta t}$	$\frac{LT^{-1}}{T} = [M^0L^1T^{-2}]$	m/s^2	cm/s^2	$1m/s^2$=100 cm/s^2

UNITS AND DIMENSIONS

S.No.	PHYSICAL QUANTITY	FORMULA/RELATION	DIMENSION	UNIT		
				S.I. / M.K.S.	C.G.S.	CONVERSION
7	momentum	p = mass x velocity = mv	$M.LT^{-1}=[M^1L^1T^{-1}]$	Kg.m/s	g.cm/s	1 Kg.m/s=10^5 g.cm/s
8	force	F = mass x acceleration = ma	$[M^1L^1T^{-2}]$	$kg.\frac{m}{s^2}=N$ (newton)	$g.\frac{cm}{s^2}$ = dyne	1 N=10^5 dyne
9	impulse	I = force x time = $F.\Delta t$	$M^1L^1T^{-2}.T = [M^1L^1T^{-1}]$	N.s	dyne.s	1N.s=10^5 dyne.s
10	Work / energy	W = force x displacement = $F.\Delta x$	$M^1L^1T^{-2}.L = [M^1L^2T^{-2}]$	N.m = J (Joule)	dyne.cm =erg	1 J=10^7 erg
11	power	$P=\frac{\text{work or energy}}{\text{time}}$	$\frac{M^1L^2T^{-2}}{T} = [M^1L^2T^{-3}]$	J/s=Watt (W)	erg/s	1 W = 10^7 erg/s
12	pressure(p) / stress	$P=\frac{force}{area}=\frac{F}{A}$	$\frac{M^1L^1T^{-2}}{L^2} = [M^1L^{-1}T^{-2}]$	N/m^2=Pa (Pascal)	$\frac{dyne}{cm^2}$	1 Pa = $\frac{Dyne}{cm^2}$
13	moment of inertia	I = mass x $(dist)^2 = m.r^2$	$[M^1L^2T^0]$	$Kg.m^2$	$g.cm^2$	1 $Kg.m^2$=10^7 $g.cm^2$
14	strain	$=\frac{\text{change in length or volume}}{\text{original length or volume}}$	$\frac{L}{L}=[M^0L^0T^0]$ (dimensionless)	Unitless		
15	modulus of elasticity (E,Y,B)	$=\frac{stress}{strain}$	$[M^1L^{-1}T^{-2}]$	N/m^2=Pa (Pascal)	$\frac{dyne}{cm^2}$	1 Pa = $\frac{Dyne}{cm^2}$
16	trigometric ratio (sin,cos,tan)		$[M^0L^0T^0]$	Unitless		
17	universal constant of gravitation(G)	$F=G\frac{m_1m_2}{r^2}$	$G=\frac{F.r^2}{m_1m_2} = \frac{M^1L^1T^{-2}.L^2}{M.M} = [M^{-1}L^3T^{-2}]$	$N.m^2/kg^2$	$dyne.cm^2/g^2$	6.67×10^{-11} $N.m^2/kg^2$ = 6.67×10^{-8} $dyne.cm^2/g^2$
18	gravitational potential(V)	$V=\frac{work}{mass}$	$\frac{M^1L^2T^{-2}}{M} = [M^0L^2T^{-2}]$	J/kg	erg/g	1 J/kg =10^4 erg/g
19	Angle / angular displacement	$\theta=\frac{arc}{radius}$	$\frac{L}{L}=[M^0L^0T^0]$	radian	radian	
20	angular velocity	$\omega=\frac{\text{angular displacement}}{time}$	$\frac{1}{T}=[M^0L^0T^{-1}]$	radian/s	radian/s	

UNITS AND DIMENSIONS

S.No.	PHYSICAL QUANTITY	FORMULA/RELATION	DIMENSION	UNIT		
				S.I. / M.K.S.	C.G.S.	CONVERSION
21	angular acceleration	$\alpha = \frac{angular\ velocity}{time}$	$\frac{M^0L^0T^{-1}}{T} = [M^0L^0T^{-2}]$	radian/s^2	radian/s^2	
22	angular momentum	$L = r \times p = m\,v\,r$	$[M^1L^2T^{-1}]$	kg m^2s^{-1}	g cm^2s^{-1}	1 kg m^2s^{-1} = 10^7 g cm^2s^{-1}
23	torque	τ = Force x distance	$[M^1L^2T^{-2}]$	N.m	dyne.cm	
24	coefficient of viscosity(η)	$F = \eta.A.\frac{\Delta v}{\Delta x}$; F=force of viscosity, A=area, v=speed, x=distance	$\eta = \frac{F.\Delta x}{A.\Delta v} = \frac{M^1L^1T^{-2}.L^1}{L^2.L^1T^{-1}} = [M^1L^{-1}T^{-1}]$	Pa.s	$\frac{dyne}{cm^2}$.s =poise	1 Pa.s=10 poise
25	Surface tension	$T = \frac{force}{length}$	$[M^1L^0T^{-2}]$	N/m	dyne/cm	1 N/m = 10^3 dyne/cm
26	Force constant of spring(k)	F=kx ; F=spring force, x=change in length of spring	$[M^1L^0T^{-2}]$	N/m	dyne/cm	1 N/m = 10^3 dyne/cm
27	Specific heat capacity(C)	$Q = m.C.\Delta T$; Q=heat, m=mass, ΔT=change in temperature	$[M^0L^2T^{-2}K^{-1}]$	J $kg^{-1}K^{-1}$		
28	Heat capacity	$= \frac{heat}{change\ in\ temp.}$	$[M^1L^2T^{-2}K^{-1}]$	JK^{-1}		
29	Latent heat(L)	Q=mL ; Q=heat, m=mass	$[M^0L^2T^{-2}]$	J Kg^{-1}		
30	Gas constant (R)	PV = nRT	$R = \frac{PV}{nT} = \frac{M^1L^{-1}T^{-2}.L^3}{mole.K} = [M^1L^2T^{-2}.mole^{-1}K^{-1}]$	$\frac{J}{mole.K}$		
31	Stefan's constant (σ)	$E = \sigma T^4$; E=emissive-power=$\frac{heat}{time\ area}$, T=temp.	$\sigma = \frac{E}{T4} = [M^1L^0T^{-3}K^{-4}]$	$\frac{W}{m^2.K^4}$		
32	Boltzmann's const.(k)	K.E. of molecule = $\frac{3}{2}kT$	$[M^1L^2T^{-2}K^{-1}]$	$\frac{J}{K}$		
33	Heat conductivity (K)	$\frac{heat}{time} = K.Area.\frac{temp.difference}{length}$	$[M^1\,L^1\,T^{-3}K^{-1}]$	$\frac{W}{m.K}$		
34	Charge(q)	Current = $\frac{charge}{time}$	$[T^1A^1]$	Coulomb(C)		
35	Electric field	$E = \frac{force}{charge}$				
36	Electric potential	$V = \frac{work}{charge}$				
37	Electrical resistance(R)	V = I R				
Rest see in book						

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