S.NO	CONCEPT	FORMULA	SI UNIT	CGS UNIT
1.	Linear momentum (P)	$P = m \times v$	$Kgms^{-1}$	$gcms^{-1}$
2.	Moment of the force (or) Torque (T)	$\tau = F \times d$	Nm (or) Kgm^2s^{-1}	dyne cm (or) gcm^2s^{-1}
3.	Moment of a couple (M)	$M = F \times S$	Nm (or) Kgm^2s^{-1}	dyne cm (or) gcm^2s^{-1}
4.	Acceleration (a)	$a = \frac{v-u}{t}$	ms^{-2}	cms^{-2}
5.	Force (F)	$F = ma$	N (or) $Kgms^{-2}$	dyne (or) $gcms^{-2}$
6.	Impulsive force (J)	$J = F \times t$ $\therefore J = \Delta p$	Ns (or) $Kgms^{-1}$	dyne s (or) $gcms^{-1}$
7.	Newton's Universal Law of Gravitation	$F = \frac{G m_1 m_2}{r^2}$	N	dyne
8.	Universal gravitational constant (G)	$G = \frac{F.r^2}{m_1 m_2}$	Nm^2kg^{-2} (or) $kg^{-1}m^3s^{-2}$	dyne cm^2g^{-2} (or) $g^{-1}cm^3s^{-2}$
9.	Acceleration due to gravity (g)	$g = \frac{GM}{R^2}$	ms^{-2}	cms^{-2}
10.	Weight (W)	$W = mg$	N (or) $Kgms^{-2}$	dyne (or) $gcms^{-2}$
11.	Mass of the earth (M_E)	$M_E = \frac{gR^2}{G}$	Kg	g
12.	Snell's law	$\frac{\sin i}{\sin r} = \frac{\mu_2}{\mu_1}$	-	-
13.	Refractive index (μ)	$\mu = \frac{c}{v}$	(No unit)	(No unit)
14.	Speed of light (c)	$c = \nu\lambda$	ms^{-1}	cms^{-1}
15.	Amount of scattering (S)	$S \propto \frac{1}{\lambda^4}$	m^{-4}	cm^{-4}
16.	Lens formula	$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$	m^{-1}	cm^{-1}
17.	Magnification (m)	$m = \frac{h'}{h}$ (or) $m = +\frac{v}{u}$	(no unit)	(no unit)

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S.No	CONCEPT	FORMULA	SI UNIT	CGS UNIT
18.	Lens makers Formula	$\frac{1}{f} = (\mu-1)\left(\frac{1}{R_1}-\frac{1}{R_2}\right)$	m^{-1}	cm^{-1}
19.	Power of a lens (P)	$P = \frac{1}{f}$	D (or) m^{-1}	cm^{-1}
20.	Focal length of Myopia	$f = \frac{xy}{x-y}$	m	cm
21.	Focal length of Hypermetropia	$f = \frac{dD}{d-D}$	m	cm
22.	Co-efficient of linear expansion	$\alpha_L = \frac{\Delta L}{L_0 \Delta T}$	K^{-1}	-
23.	" Superficial (or) Areal expansion	$\alpha_A = \frac{\Delta A}{A_0 \Delta T}$	K^{-1}	-
24.	" Volumetric (or) Cubical expansion	$\alpha_V = \frac{\Delta V}{V_0 \Delta T}$	K^{-1}	-
25.	Real expansion	$L_3 - L_2$	K^{-1}	-
26.	Apparent expansion	$L_3 - L_1$	K^{-1}	-
27.	Boyle's law	$PV = \text{constant}$ (or) $V \propto \frac{1}{P}$	-	-
28	Charle's law Law of volume (or)	$V \propto T$ (or) $\frac{V}{T} = \text{constant}$	-	-
29.	Avogadro's law	$V \propto n$ (or) $\frac{V}{n} = \text{constant}$		
30.	Ideal gas equation	$PV = RT$	-	-
31.	Electric current (I)	$I = \frac{Q}{t}$	A (or) CS^{-1}	-
32.	Electric charge (Q)	$Q = ne$	Coulomb (C)	-
33	potential difference (V)	$V = \frac{W}{Q}$	volt (V)	-
34.	one volt	$1V = \frac{1J}{1C}$	"	-
35.	one ampere	$1A = \frac{1C}{1S}$	"	-

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S.No	CONCEPT	FORMULA	SI UNIT	CGS UNIT
36.	Ohm's Law	$V = IR$ (or) $I \propto V$	Volt (V)	"
37.	Resistance (R)	$R = \frac{V}{I}$	ohm (Ω)	"
38.	One ohm	$1\Omega = \frac{1V}{1A}$	"	"
39.	Electrical resistivity (ρ)	$\rho = \frac{RA}{L}$	Ω m	"
40.	Electrical conductivity (σ)	$\sigma = \frac{1}{\rho}$ (or) $\sigma = \frac{L}{RA}$	$\Omega^{-1} m^{-1}$ (or) mho m^{-1}	"
41.	Electrical conductance (G)	$G = \frac{1}{R}$	Ω^{-1} (or) mho	
42.	Resistance in series (R_s)	$R_s = R_1 + R_2 + R_3$	Ω	
43.	Resistance in parallel (R_p)	$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$	Ω	
44.	series connection of parallel resistors	$R_{total} = R_{P_1} + R_{P_2}$	$R_{P_1} = \frac{1}{R_1} + \frac{1}{R_2}$; $R_{P_2} = \frac{1}{R_3} + \frac{1}{R_4}$	
45.	parallel connection of series resistors	$\frac{1}{R_{total}} = \frac{1}{R_{S_1}} + \frac{1}{R_{S_2}}$	$R_{S_1} = R_1 + R_2$; $R_{S_2} = R_3 + R_4$	
46.	Joule's law of heating	~~H = VIt~~ $H = I^2 R t$	Joule (J)	
47.	Electric power (P)	$P = VI$	Watt (W)	
48.	Electrical energy (E)	$E = P \times t$	Watt hour (Wh)	
49.	one watt	$1W = 1V \times 1A$	-	-
50.	Velocity (V)	$V = \frac{d}{t}$	ms^{-1}	cms^{-1}

S.No	CONCEPT	FORMULA	SI UNIT	CGS UNIT
51.	Velocity of Sound (V)	$V = \frac{\lambda}{T}$ (or) $V = n\lambda$	ms^{-1}	cms^{-1}
52.	Effect of density (d)	$V \propto \sqrt{\frac{1}{d}}$		
53.	Effect of Temperature (T)	$V \propto \sqrt{T}$ $V_T = (V_0 + 0.61T)$	ms^{-1}	cms^{-1}
54.	Laws of reflection	$\angle i = \angle r$	-	-
55.	Velocity of Echo	$V = \frac{2d}{t}$	ms^{-1}	cms^{-1}
56.	Minimum distance of Echo	$d = \frac{V \times 0.1}{2}$ (or) $d = \frac{V}{20}$	m	cm
57.	Doppler effect	$n' = \left(\frac{V \pm V_L}{V \pm V_S}\right) n$		
58.	Mass and Energy relation	$E = mc^2$	J (or) Kgm^2s^{-2}	~~$kgms^{-2}$~~ gcm^2s^{-2}
59.	Radioactivity		Bq	-

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S.No	CONCEPT	VALUE
60.	Fusion bomb	Hydrogen bomb
61.	Fission bomb	Atom bomb
62.	Nuclear fission high temp. order	10^7 K to 10^9 K
63.	One electron volt (1 eV)	1.602×10^{-19} J
64.	Na^{24} - Functioning of heart	
65.	I^{131} - cure goiter	
66.	Fe^{59} - Diagnose Anaemia	
67.	P^{32} - Skin cancer disease	
68.	Co^{60} and Au^{198} Skin cancer.	
69.	Cf^{252} - Detect the explosive in the luggage.	
70.	Am^{241} ↓ Smoke detector.	
71.	C-14 → Age of earth, fossils, old paintings, monuments	

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S.NO	CONCEPT	VALUE WITH UNIT
1.	1 kgf	1 kgf = 9.8 N (or) 98×10^4 dyne
2.	1 gf	1 gf = 980 dyne
3.	1 N	$1\ N = 10^5$ dyne
4.	Acceleration due to gravity (g) (Earth)	$g = 9.8\ ms^{-2}$
5.	Mass of the Earth (M_E)	$M_E = 5.972 \times 10^{24}$ kg
6.	Radius of the Earth (R_E)	$R_E = 6378$ km (or) $= 6378000$ m ($R_E \simeq 6400$ km)
7.	Universal gravitational constant value (G)	$G = 6.674 \times 10^{-11}\ Nm^2kg^{-2}$
8.	Acceleration due to gravity of the surface of the moon (g_M)	$g_M = 1.625\ ms^{-2}$
9.	Speed of light in air (or) Vacuum (c)	$c = 3 \times 10^8\ ms^{-1}$
10.	Normal human eye distinct vision (D)	D = 25 cm (or) D = 0.25m
11.	0 K = ?	0K = $-273^\circ C$
12.	Co-efficient of cubic expansion. i) Aluminium (Al) ii) Brass iii) Glass iv) water (H_2O) v) Mercury (Hg).	i) Al = $7 \times 10^{-5}\ K^{-1}$ ii) Brass = $6 \times 10^{-5}\ K^{-1}$ iii) Glass = $2.5 \times 10^{-5}\ K^{-1}$ iv) water = $20.7 \times 10^{-5}\ K^{-1}$ v) Hg = $18.2 \times 10^{-5}\ K^{-1}$

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S.NO	CONCEPT	VALUE WITH UNIT
13.	Avogadro's Number (N_A)	$N_A = 6.023 \times 10^{23}$ /mol
14.	Boltzmann Constant (K_B)	$K_B = 1.38 \times 10^{-23}$ JK^{-1}
15.	Universal gas constant (R)	R = 8.31 J mol^{-1} K^{-1}
16.	Electric ha charge of electron (e)	$e = 1.6 \times 10^{-19}$ C
17.	Nichrome (is a conductor with highest resistivity)	Nichrome = 1.5×10^{-6} Ωm.
18.	Electrical Resistivity (ρ) i) Conductor :- 1) Copper (Cu) 2) Nickel (Ni) 3) Chromium (Cr) ii) Insulator :- 1) Glass 2) Rupper	1) Cu = 1.62×10^{-8} Ωm 2) Ni = 6.84×10^{-8} Ωm 3) Cr = 12.9×10^{-8} Ωm 1) Glass = 10^{10} to 10^{14} Ωm 2) Rupper = 10^{13} to 10^{16} Ωm
19.	1 Kwh = ?	1 Kwh = 3.6×10^6 J (or) 1 Kwh = 1000 watt hour.
20.	Horse power (hp)	hp = 746 Watt
21.	India - domestic potential difference (or) volt (or) AC and frequency (ν)	220 V to 230 V ν = 50 Hz
22.	USA, UK - domestic AC and frequency (AC - Alternating current)	110 V to 120 V ν = 60 Hz

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S.NO	CONCEPT	VALUE WITH UNIT
23.	Audible waves	20 HZ to 20,000 HZ (or) 20 HZ to 20 KHZ
24.	Infrasonic waves	Below 20 HZ (or) < 20 HZ
25	Ultrasonic waves	Above 20 KHZ (or) (> 20 KHZ)
26.	Sound - wavelength (λ) Range	1.65 cm to 1.65 m
27.	Light - wavelength (λ) Range	4×10^{-7} m to 7×10^{-7} m
28.	Sound waves travel in air	V = 340 ms^{-1} at NTP.
29.	Speed of Sound.	
	1) Solid	Copper = 5010 ms^{-1} Iron = 5950 ms^{-1} Aluminium = 6420 ms^{-1}
	2) Liquid	Kerosene = 1324 ms^{-1} Water = 1493 ms^{-1} Sea water = 1533 ms^{-1}
	3) Gas	Air (at 0°c) = 331 ms^{-1} Air (at 20°c) = 343 ms^{-1}
30.	The minimum time gap between the original sound and Echo must be	t = 0.1 s
31.	The minimum distance required to hear an echo is	d = 17.2 m

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S.No	CONCEPT	VALUE WITH UNIT
32.	One Curie (1C)	$1C = 3.7 \times 10^{10}$ disintegration per second.
33.	One Rutherford (1Rd)	$1Rd = 10^{6}$ disintegration per second.
34.	One Becquerel (1 Bq)	1 Bq = One disintegration per second.
35.	One Roentgen (1 R)	$1R = 2.58 \times 10^{-4}$ C in 1 kg under SPT and Humidity.
36.	Alpha decay	$_{92}U^{238} \rightarrow {}_{90}Th^{234} + {}_{2}He^{4}$
37.	Beta decay	$_{15}P^{32} \rightarrow {}_{16}S^{32} + {}_{-1}e^{0}$
38.	Nuclear Fission	$_{92}U^{235} + {}_{0}n^{1} \rightarrow {}_{56}Ba^{141} + {}_{36}Kr^{92} + 3\,{}_{0}n^{1} + Q$
39	Energy released in Nuclear fission (Q)(E)	$E = 200$ MeV (or) $E = 3.2 \times 10^{-11}$ J
40.	Nuclear Fusion	$_{1}H^{2} + {}_{1}H^{2} \rightarrow {}_{2}He^{4} + Q$
41.	Energy released in Nuclear Fusion (E)	$E = 3.84 \times 10^{-12}$ J
42	Fissionable materials	U^{235}, plutonium (Pu^{239}, Pu^{241})
43.	Natural uranium	$_{92}U^{238}$ - 99.28%, $_{92}U^{235}$ - 0.72%
44.	Fertile materials	U^{238}, Th^{232}, Pu^{240}
45.	Controlled chain reaction	Nuclear reactor.
46.	Uncontrolled chain reaction	Atom bomb and Hydrogen bomb