

PHYSICS LABORATORY MANUAL

FOR FIRST YEAR B.E. STUDENTS

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CONTENTS

Sl. No.	NAME OF THE EXPERIMENT	Page No.
	UNITS AND CONSTANTS	
	A. SCREW GAUGE	2
	B. VERNIER CALIPER	6
1	COMPOUND PENDULUM - DETERMINATION OF ACCELERATION DUE TO GRAVITY	10
2	TORSIONAL PENDULUM - DETERMINATION OF MOMENT OF INERTIA AND RIGIDITY MODULUS	14
3	YOUNG'S MODULUS - CANTILEVER DEPRESSION	18
4	EMISSIVITY - SPHERICAL CALORIMETER	22
5	THERMAL CONDUCTIVITY - LEE'S DISC	26
6	ULTRASONIC INTERFEROMETER	32
7	NEWTON'S RINGS - RADIUS OF CURVATURE	36
8	SPECTROMETER - i - d CURVE	40
9	SPECTROMETER - DIFFRACTION GRATING	44
10	LASER GRATING	48
11	BASIC LOGIC GATES	52
12	NAND - UNIVERSAL BUILDING BLOCK	56
13	NOR - UNIVERSAL BUILDING BLOCK	60
14	TRANSISTOR CHARACTERISTICS - CE MODE	64
15	DIODE CHARACTERISTICS	68

Basic Units

No	Physical Quantity	Symbol	SI unit	Symbol
1	Length	l	Metre	m
2	Mass	m	Kilogram	kg
3	Time	t	Second	S
4	Electric current	I	Ampere	A
5	Luminous Intensity	I _v	Candela	Cd
6	Amount of substance	n	mole	mol

Derived Units

No	Physical Quantity	Symbol	SI unit	Dimension	Symbol
1	Area	A	Sq. metre	m ²	
2	Volume	V	Cubic metre	m ³	
3	Density	ρ	Kilogram per cub met	kgm ⁻³	
4	Velocity	u, v	Metre per second	ms ⁻¹	
5	Angular velocity	ω	Radian per second	rad s ⁻¹	
6	Acceleration	a	Meter per second ²	ms ⁻²	
7	Angular acceleration	α	Radian per second ²	Rad s ⁻²	
8	Force	F	Newton	kgms ⁻²	N
9	Energy, work	E, W	Joule	Nm	J
10	Power	P	Watt	Js ⁻¹	W
11	Pressure/Tension	p	Pascal	Nm ⁻²	Pa
12	Surface Tension	σ	Newton per metre	Nm ⁻¹	-
13	Momentum	-	Kg. metre per second	kgms ⁻¹	
14	Frequency	v, f	Hertz	s ⁻¹	Hz
15	Young's modulus	E	Newton per sq. metre	Nm ⁻²	
16	Rigidity modulus	n	Newton per sq. metre	Nm ⁻²	
17	Bulk modulus	K	Newton per sq. metre	Nm ⁻²	
18	Quantity of heat	Q	Joule	J	J
19	Sp. heat capacity	S	Joules per kg per Kelvin	Jkg ⁻¹ K ⁻¹	
20	Sp. latent heat	l	Joules per kilo gram	Jkg ⁻¹	
21	Thermal conductivity	K	Joule /second /metre /kelvin	Jm ⁻¹ s ⁻¹ K ⁻¹	Wm ⁻¹ K ⁻¹
22	Emissivity	e	Joule /second /meter ² kelvin	Jm ⁻² s ⁻¹ K ⁻¹	Wm ⁻² K ⁻¹
23	Entropy	S	Joules per kelvin per Kg	Jkg ⁻¹ K ⁻¹	
24	Luminous flux	φ	Flux solid angle	Cd sr	
25	Illumination	E	Lumen per sq. meter	Lm ⁻²	lx
26	Refractive index	n or μ	-	-	-
27	Magnetic flux	φ	Weber	Vs	Wb
28	Magnetic induction	B	Tesla	Wbm ⁻²	T
29	Conductance	G	Siemens		S
30	Inductance	L	Henry	H	H
31	Capacitance	C	Farad	F	F
32	Potential difference	V	Volt	V	V

Physical Constants

No	Physical Quantity	Symbol	Value	Symbol (SI unit)
1	Speed of light	c	2.997925×10^8	ms^{-1}
2	Gravitational Constant	G	6.673×10^{11}	$\text{Nm}^2\text{kg}^{-2}$
3	Acceleration due to gravity	g	9.78281	ms^{-2}
4	Avagadro number	NA	6.02217×10^{23}	mol^{-1}
5	Boltzmann Constant	k	1.38062×10^{-22}	jk^{-1}
6	Planck's constant	h	6.62620×10^{34}	Js
7	Gas Constant	R	8.3143	$\text{JK}^{-1}\text{mol}^{-1}$
8	Faraday's constant	F	9.64867×10^4	Cmol^{-1}
9	Unified Atomic mass unit	amu	1.66043×10^{-27}	kg
10	Electronic Charge	e	1.602192×10^{-9}	C
11	Electronic rest mass	m_e	9.10956×10^{-31}	kg
12	Specific charge of electron	E/m_e	1.758803×10^{11}	Ckg^{-1}
13	Proton rest mass	M_p	1.672614×10^{-27}	kg
14	Neutron rest mass	M_n	1.674920×10^{-27}	kg
15	Rydberg Constant	R_α	1.097373×10^7	m^{-1}
16	Permeability of free space	μ_0	$4\pi \times 10^{-7}$	Hm^{-1}

