

INDEX

A

Absolute scale temperature	276
Absolute zero	276
Acceleration (linear)	45
Acceleration due to gravity	49, 189
Accuracy	22
Action-reaction	97
Addition of vectors	67
Adiabatic process	306, 307
Aerofoil	258
Air resistance	79
Amplitude	340, 368
Angle of contact	263, 264
Angstrom	21
Angular Acceleration	154
Angular displacement	338
Angular frequency	340, 369
Angular momentum	155
Angular velocity	152
Angular wave number	368
Antinodes	376
Archimedes Principle	251
Area expansion	277
Atmospheric pressure	249
Average acceleration	45, 74
Average speed	42
Average velocity	42
Avogadro's law	320

B

Banked road	104
Barometer	250
Beat frequency	338, 380, 381
Beats	379, 380
Bending of beam	240
Bernoulli's Principle	254
Blood pressure	272, 273
Boiling point	283
Boyle's law	321
Buckling	240

Bulk modulus	238
Buoyant force	251

C

Calorimeter	281
Capillary rise	264
Capillary waves	366
Carnot engine	311
Central forces	186
Centre of Gravity	161
Centre of mass	144
Centripetal acceleration	81
Centripetal force	104
Change of state	282
Charle's law	321
Chemical Energy	126
Circular motion	104
Clausius statement	310
Coefficient of area expansion	279
Coefficient of linear expansion	277
Coefficient of performance	309
Coefficient of static friction	101
Coefficient of viscosity	258
Coefficient of volume expansion	277
Cold reservoir	308
Collision	129
Collision in two dimensions	131
Compressibility	238
Compressions	364, 365, 371
Compressive stress	232, 239
Conduction	286
Conservation laws	12
Conservation of angular momentum	157, 173
Conservation of Mechanical Energy	121
Conservation of momentum	98
Conservative force	121
Constant acceleration	46, 75
Contact force	100
Convection	289
Couple	159
Crest	367
Cyclic process	307

D

Dalton's law of partial pressure	321
Damped oscillations	351
Damped simple Harmonic motion	351
Damping constant	351
Damping force	351
Derived units	16
Detergent action	265
Diastolic pressure	273
Differential calculus	61
Dimensional analysis	32
Dimensions	31
Displacement vector	66
Displacement	40
Doppler effect	381, 382
Doppler shift	383
Driving frequency	354
Dynamics of rotational motion	169

E

Efficiency of heat engine	308
Elastic Collision	129
Elastic deformation	232, 234
Elastic limit	234
Elastic moduli	235
Elasticity	231
Elastomers	235
Electromagnetic force	8
Energy	117
Equality of vectors	66
Equation of continuity	253
Equilibrium of a particle	99
Equilibrium of Rigid body	158
Equilibrium position	337, 338, 349
Errors in measurement	22
Escape speed	193

F

First law of Thermodynamics	302
Fluid pressure	247
Force	94
Forced frequency	353
Forced oscillations	353
Fracture point	234
Free Fall	49
Free-body diagram	100
Frequency of periodic motion	338, 369
Friction	101
Fundamental Forces	6
Fundamental mode	377
Fusion	282

G

Gauge pressure	249
Geocentric model	183

Geostationary satellite	196
Gravitational constant	189
Gravitational Force	8, 192
Gravitational potential energy	191
Gravity waves	366

H

Harmonic frequency	377, 378
Harmonics	377, 378
Heat capacity	280
Heat engines	308
Heat pumps	308
Heat	274
Heliocentric model	183
Hertz	338
Hooke's law	234
Horizontal range	78
Hot reservoir	308
Hydraulic brakes	251, 252
Hydraulic lift	251, 252
Hydraulic machines	251
Hydraulic pressure	234
Hydraulic stress	234, 239
Hydrostatic paradox	249

I

Ideal gas equation	276
Ideal gas	321
Impulse	96
Inelastic collision	129
Initial phase angle	368
Instantaneous acceleration	74
Instantaneous speed	45
Instantaneous velocity	43
Interference	374
Internal energy	301, 325
Irreversible engine	311, 313
Irreversible processes	310
Isobaric process	306, 307
Isochoric process	306, 307
Isotherm	305
Isothermal process	306

K

Kelvin-Planck statement	310
Kepler's laws of planetary motion	184
Kinematics of Rotational Motion	167
Kinematics	39
Kinetic energy of rolling motion	174
Kinetic Energy	117
Kinetic interpretation of temperature	324
Kinetic theory of gases	323

L

Laminar flow	254, 260
Laplace correction	373

- | | | | |
|---|---------------|---------------|--|
| Latent heat of fusion | 285 | | |
| Latent heat of vaporisation | 285 | | |
| Latent heat | 284 | | |
| Law of cosine | 72 | | |
| Law of equipartition of energy | 327 | | |
| Law of Inertia | 90 | | |
| Law of sine | 72 | | |
| Linear expansion | 277 | | |
| Linear harmonic oscillator | 345, 347 | | |
| Linear momentum | 155 | | |
| Longitudinal strain | 232 | | |
| Longitudinal strain | 232, 235 | | |
| Longitudinal stress | 232 | | |
| Longitudinal Wave | 366, 372 | | |
| M | | | |
| Magnus effect | 257 | | |
| Manometer | 250 | | |
| Mass Energy Equivalence | 126 | | |
| Maximum height of projectile | 78 | | |
| Maxwell Distribution | 326 | | |
| Mean free path | 319, 330 | | |
| Measurement of length | 18 | | |
| Measurement of mass | 21 | | |
| Measurement of temperature | 275 | | |
| Measurement of time | 22 | | |
| Melting point | 282 | | |
| Modes | 376 | | |
| Modulus of elasticity | 234 | | |
| Modulus of rigidity | 238 | | |
| Molar specific heat capacity at constant pressure | 280, 304 | | |
| Molar specific heat capacity at constant volume | 280, 304 | | |
| Molar specific heat capacity | 280 | | |
| Molecular nature of matter | 318 | | |
| Moment of Inertia | 163 | | |
| Momentum | 93 | | |
| Motion in a plane | 72 | | |
| Multiplication of vectors | 67 | | |
| Musical instruments | 380 | | |
| N | | | |
| Natural frequency | 354 | | |
| Newton's first law of motion | 91 | | |
| Newton's Law of cooling | 290 | | |
| Newton's law of gravitation | 185 | | |
| Newton's second law of motion | 93 | | |
| Newton's third law of motion | 96 | | |
| Newtons' formula for speed of sound | 372 | | |
| Nodes | 376 | | |
| Normal Modes | 376, 377, 379 | | |
| Note | 380, 381 | | |
| Nuclear Energy | 126 | | |
| Null vector | 68 | | |
| O | | | |
| Odd harmonics | | 378 | |
| Orbital velocity/speed | | 194 | |
| Order of magnitude | | 28 | |
| Oscillations | | 337 | |
| Oscillatory motion | | 337 | |
| P | | | |
| Parallax method | | 18 | |
| Parallelogram law of addition of vectors | | 66 | |
| Pascal's law | | 248 | |
| Path length | | 40 | |
| Path of projectile | | 78 | |
| Periodic force | | 353 | |
| Periodic motion | | 337 | |
| Periodic time | | 337 | |
| Permanent set | | 234 | |
| Phase angle | | 340 | |
| Phase constant | | 340 | |
| Phase diagram | | 283 | |
| Pipe open at both ends | | 380 | |
| Pipe open at one end | | 379 | |
| Pitch | | 382 | |
| Plastic deformation | | 234 | |
| Plasticity | | 231 | |
| Polar satellite | | 196 | |
| Position vector and displacement | | 73 | |
| Potential energy of a spring | | 123 | |
| Potential energy | | 120 | |
| Power | | 128 | |
| Precession | | 143 | |
| Pressure gauge | | 249 | |
| Pressure of an ideal gas | | 323 | |
| Pressure pulse | | 366 | |
| Pressure | | 246 | |
| Principle of Conservation of Energy | | 128 | |
| Principle of moments | | 160 | |
| Progressive wave | | 366 | |
| Projectile motion | | 77 | |
| Projectile | | 77 | |
| Propagation constant | | 368 | |
| Pulse | | 365 | |
| Q | | | |
| Quasi-static process | | 305, 306 | |
| R | | | |
| Radial acceleration | | 344 | |
| Radiation | | 290 | |
| Radius of Gyration | | 164 | |
| Raman effect | | 11 | |
| Rarefactions | | 364, 365, 371 | |
| Ratio of specific heat capacities | | 329 | |
| Reaction time | | 51 | |
| Real gases | | 321 | |
| Rectilinear motion | | 39 | |

Reductionism	2	Sublimation	284
Reflected wave	375	Subtraction of vectors	67
Reflection of waves	374	Superposition principle	374
Refracted wave	375	Surface energy	261
Refrigerator	308	Surface tension	261
Regelation	282	Symmetry	146
Relative velocity in two dimensions	76	System of units	16
Relative velocity	51	Systolic pressure	273
Resolution of vectors	69		
Resonance	354	T	
Restoring force	232, 345, 364	Temperature	275
Reversible engine	311, 312	Tensile strength	234
Reversible processes	310	Tensile stress	232
Reynolds number	260	Terminal velocity	260
Rigid body	141	Theorem of parallel axes	167
Rolling motion	173	Theorem of perpendicular axes	165
Root mean square speed	325	Thermal conductivity	287
Rotation	142	Thermal equilibrium	299
		Thermal expansion	276
S		Thermal stress	279
S.H.M. (Simple Harmonic Motion)	339	Thermodynamic processes	305
Scalar-product	114	Thermodynamic state variables	304
Scalars	65	Thermodynamics	3, 298
Scientific Method	1	Time of flight	78
Second law of Thermodynamics	309	Torque	154
Shear modulus	238	Torricelli's Law	255, 256
Shearing strain	233	Trade wind	289
Shearing stress	232, 239	Transmitted wave	375
SI units	16	Travelling wave	376
Significant figures	27	Triangle law of addition of vectors	66
Simple pendulum	338, 349	Triple point	283
Soap bubbles	264	Trough	367
Sonography	383	Tune	380
Sound	371	Turbulent flow	253, 254
Specific heat capacity of Solids	303, 330		
Specific heat capacity of Gases	328, 329	U	
Specific heat capacity of Water	330	Ultimate strength	234
Specific heat capacity	280, 303	Ultrasonic waves	383
Speed of efflux	255	Unification of Forces	10
Speed of Sound	371, 372	Unified Atomic Mass Unit	21
Speed of Transverse wave on a stretched string	370, 371	Uniform circular motion	79
Sphygmomanometer	273	Uniform Motion	41
Spring constant	348, 351	Uniformly accelerated motion	47
Standing waves	376	Unit vectors	70
Stationary waves	378		
Steady flow	253	V	
Stethoscope	273	Vane	351
Stokes' law	259	Vaporisation	283
Stopping distance	50	Vector-product	151
Strain	232	Vectors	66
Streamline flow	253, 254	Velocity amplitude	344
Streamline	253, 254	Venturi meter	256
Stress	232	Vibration	337
Stress-strain curve	234	Viscosity	258
Stretched string	370	Volume expansion	277
		Volume Strain	234

W		
Wave equation	370	
Wave length	368	
Wave speed	370	
Waves	363	
Waxing and waning of sound	381	
Weak nuclear force	9	
Weightlessness	197	
Work done by variable force	118	
Work	116	
		Work-Energy Theorem 116
		Working substance 308
		Y
		Yield Point 234
		Yield strength 234
		Young's modulus 235
		Z
		Zeroth law of Thermodynamics 300