

CONTENTS

1	OPTICAL ILLUSIONS	1	25	SOURCES OF MUSICAL SOUNDS	221
2	UNITS OF MEASUREMENT, SPEED, AND VELOCITY	10	26	ELECTRICITY AT REST	233
3	ACCELERATION	19	27	ELECTRICITY IN MOTION	242
4	GRAVITY AND FALLING BODIES	25	28	KIRCHHOFF'S LAWS AND ELECTRICAL CIRCUITS	250
5	NEWTON'S FIRST AND SECOND LAWS OF MOTION	33	29	ELECTRIC FIELDS, POTENTIAL, AND CAPACITANCE	256
6	VECTOR ADDITION AND COMPOSITION OF FORCES	42	30	MAGNETISM	264
7	NEWTON'S LAW OF GRAVITATION AND THIRD LAW OF MOTION	54	31	EFFECTS OF ELECTRIC CURRENTS	274
8	FRICTION AND STREAMLINING	61	32	MAGNETIC INDUCTION	284
9	PROJECTILES	70	33	INDUCED ELECTRIC CURRENTS	292
10	WORK, ENERGY, AND POWER	80	34	DIPOLE MOMENTS AND MAGNETISM	299
11	CONSERVATION OF ENERGY	87	35	TRANSFORMERS	310
12	CONSERVATION OF MOMENTUM	93	36	ALTERNATING CURRENTS	318
13	CIRCULAR MOTION AND KEPLER'S LAWS	102	37	PROPERTIES OF LIGHT	327
14	GRAVITATIONAL FIELDS AND ORBITING SATELLITES	111	38	REFRACTION	337
15	CENTER OF MASS AND ROTATIONAL EQUILIBRIUM	120	39	DISPERSION	346
16	KINEMATICS AND DYNAMICS OF ROTATION	130	40	LENSES	354
17	PROPERTIES OF SOLIDS AND LIQUIDS	140	41	OPTICAL INSTRUMENTS	363
18	PROPERTIES OF GASES, AND FLUIDS IN MOTION	150	42	THE SCIENCE OF COLOR	373
19	TEMPERATURE, SPECIFIC HEAT, AND THERMAL EXPANSION	164	43	DIFFRACTION AND INTERFERENCE OF LIGHT	381
20	HEAT TRANSFER AND THE ATMOSPHERE	175	44	THE POLARIZATION OF LIGHT	394
21	THERMODYNAMICS, AND ROCKET ENGINES	184	45	LIGHT SOURCES AND SPECTROGRAPHS	404
22	VIBRATIONS AND WAVES	193	46	CLASSIFICATION OF SPECTRA	411
23	SOUND: ITS TRANSMISSION AND DETECTION	202	47	THE ATOMIC STRUCTURE OF MATTER	419
24	RESONANCE, BEATS, DOPPLER EFFECT, AND INTERFERENCE	211	48	THE DISCOVERY OF THE ELECTRON	427
			49	ATOMS AND THE PERIODIC TABLE	435
			50	THE PHOTOELECTRIC EFFECT	444
			51	THE STRUCTURE OF ATOMS	452
			52	SPINNING ELECTRONS	461
			53	X RAYS	473
			54	ELECTROMAGNETIC WAVES AND VACUUM TUBES	482
			55	THE SOLID STATE AND SEMICONDUCTORS	492
			56	MOVING FRAMES OF REFERENCE	502

57	INTERFEROMETERS AND LASERS	512
58	RELATIVITY	524
59	ELECTRON OPTICS	532
60	RADIO, RADAR, TELEVISION, AND MICROWAVES	541
61	PHOTON COLLISIONS AND ATOMIC WAVES	552
62	RADIOACTIVITY	566
63	DISINTEGRATION AND TRANSMUTATION	574
64	BETA AND GAMMA RAYS	584
65	ATOMIC COLLISIONS AND NUCLEAR DISINTEGRATION	593
66	COSMIC RAYS	604
67	ATOMIC PARTICLE ACCELERATORS	617
68	TRANSMUTATION OF THE ELEMENTS	627
69	NEUTRON AND GAMMA-RAY REACTIONS	642
70	SPECIAL ATOMIC AND NUCLEAR EFFECTS	653
71	THE ATOMIC NUCLEUS	662
72	FISSION AND FUSION	672
73	NUCLEAR ENERGY	684
74	ELEMENTARY PARTICLES	698
75	FIELD THEORY AND WORLD LINES	715

CONTENTS

APPENDICES

I	Values of the General Physical Constants	727
II	Units and Their Abbreviations	728
III	Trigonometric Tables	729
IV	Common Logarithms	730
V	The Slide Rule	732
VI	Elements of Trigonometry	737
VII	Complete List of the Stable Isotopes of the Chemical Elements	741
VIII	Relative Masses of One Stable Iso- tope for Each of the Elements	743
IX	Table of Isotopes and Their Properties	744
X	The Periodic Table of Chemical Elements	747
XI	Electron Subshells	748
XII	Nobel Prize Winners in Physics	749
XIII	Powers of Ten Notation, and Algebra	751
	INDEX	755