EBU12GT093 : APPLIED PHYSICS

UNIT I – PROPERTIES OF MATTER (24 Hours)

Elasticity

Stress – Strain – Hooke's law – Elastic Behaviour of Material – Factors affecting Elasticity – Young's modulus by cantilever – Uniform bending – Non-uniform bending. Torsional Pendulum – Determination of Moment of Inertia, Determination of Rigidity Modulus – Compound Pendulum

Center of Gravity – Definition – Moment of inertia – Theorems – Moment of Inertia of rectangular and triangular plate.

UNIT II – TECHNICAL ACOUSTICS (20 Hours)

Reverberation Time

Acoustics of buildings – Reverberation, echo, creep, focusing, standing wave, Principles to be observed in the Acoustical design of an Auditorium – Noise Pollution – Noise control in machines – Absorption coefficient – Sabine's formula.

Ultrasonics

Generation – Piezoelectric method – Magnetostriction method – Acoustical grating – Determination of Ultrasonic Wavelength – Applications of Ultrasonics in industries – NDT

UNIT III – OPTICS (25 Hours)

LASER

Principles – Einstein theory of spontaneous and stimulated emission – Population inversion - Different kinds of Lasers – Nd:YAG laser, CO_2 laser – Applications of Lasers in 3D profiling, computer peripherals such as CD-ROM.

Fiber Optics

Types of Optical Fibers – step index – grated index single mode – multiple mode fiber – Attenuation – Dispersion of waves through fibers – acceptance angle – Numerical aperture – applications in engineering and medicine.

UNIT IV – MODERN PHYSICS (20 Hours)

X – Rays – properties – Bragg's law – Compton effect – Application of X – Rays in medicine and industry.

Liquid Drop Model – Shell model – Nuclear fission – Bohr and Wheeler's theory – Chain reaction – Atom bomb – Nuclear reactors – Breeder reactor – Nuclear fusion – Thermo nuclear reactions – Hydrogen bomb.

UNIT V – MATERIAL SCIENCE (30 Hours)

Magnetism in Solids

Types of Magnetism – Dia, Para, Ferro, Antiferro, Ferrimagnetism – Properties – Applications of magnetic principles in computer storage such as Floppy disks.

Dielectrics

Definition – Dielectric Breakdown – Dielectric loss – Internal field – Classius-Mossotti relation.

Introduction to New Materials

Metallic glasses – Nano materials – Shape memory alloys – Bio materials

Superconductors

Introduction – BCS theory – Meissner effect – Type I & Type II superconductors – Tunneling phenomenon – Josephson effect (AC & DC) – High Tc Superconductors – Applications.

TEXT BOOKS

1. Applied Engineering Physics – Rajendran & Marikani – Tata McGraw Hill Publications.
2. Modern Engineering Physics – R.K.Gaur & S.L.Gupta – Dhanpat Rai publications.
3. Modern Engineering Physics – A.S.Vasudeva – S.Chand & Company Ltd.
4. Applied Physics – P.Mani – Dhanam Publications.
5. Engineering Physics – B.N.Shankar & S.O.Pillai – New Age International Publishers.

REFERENCE BOOKS

1. Properties of Matter - D.S.Mathur. (Unit I)
2. Sound - Brijilal & Subramanian. (Unit II)
3. Engineering Physics - Rubhan Kumar. (Unit II & III)
4. Engineering Physics - M.N.Avadhanulu. (Unit III)
5. Fiber Optics - R.Agarwal. (Unit III)
6. Modern Physics - R.Murugesan. (Unit IV, V)
7. Superconductivity - Kacchava. (Unit V)

EBU12GP041 : PHYSICS PRACTICAL

List of Experiments

Any 15

1. Determination of Acceleration due to gravity 'g' using Compound Pendulum.
2. Determination of Rigidity Modulus & Moment of Inertia using Torsional Pendulum
3. Determination of Young's Modulus using Cantilever Depression.
4. Determination of Wavelength of Laser light using transmission grating.
5. Determination of Coefficient of Thermal conductivity using Lee's Disc method.
6. Determination of Emissivity of a Surface using Spherical calorimeter.
7. Determination of Refractive index of material of prism using Spectrometer i-d curve.
8. Determination of Radius of curvature of the given lens using Newton's rings.
9. Study of Forward and reverse characteristics of a PN junction diode.
10. To study the characteristics of a NPN / PNP transistor in CE mode.
11. Basic logic gates – Verification of truth tables (OR, AND, NOT, NAND, NOR).
12. NAND & NOR as Universal building blocks – Verification of Demorgan's theorem.
13. Determination of Velocity of sound waves in liquid using Ultrasonic interferometer.
14. Measurement of Attenuation and numerical aperture using optical fiber.
15. Determination of size of the particle – Laser source.
16. Determination of conductivity of solids using Four probe method.
17. Determination of Defects in solids Ultrasonic techniques.

REFERENCE BOOKS FOR PHYSICS PRACTICALS

1. Practical Physics – Quseph and Rangarajan.
2. Engineering practical Physics – K.Srinivasa.
3. Engineering practical Physics – M.N.Avadhanulu.