BHARATHIAR UNIVERSITY, COIMBATORE

ALLIED PHYSICS PAPER FOR B. Sc MATHS / CHEMISTRY
2007-2008 BATH AND ONWARDS

ALLIED PHYSICS PAPER I

No. of Credit Hours: 4 per week

Subject Description:

This paper presents the basic principles of mechanics, heat and sound.
This paper gives the Knowledge of depth for students regarding the motion of the particles, liquids and the propagation of heat and sound waves.

Goal: To enable the students in order to learn the basic principles, theory and concepts of mechanics, heat and sound.

Objectives

To give the description for the students in order to
Learn motion of rigid bodies.
Acquire basic knowledge of heat energy.
Know about the propagation of sound waves.
Get a depth of knowledge of physics in day today life.

UNIT- I

Gravitation: Newton's law of Gravitation-Determination of G by Boy's method-mass and density of earth – acceleration due to gravity- Determination of g by compound pendulum.

Elasticity: Basic concepts – bending of beams – depression of cantilever-Determination of Y by uniform and non- uniform bending method- Torsion in a wire-Determination of rigidity modulus by torsional pendulum.

UNIT II

Heat and thermodynamics : Vanderwaal's equation of state-critical constants of a gas-derivation of critical constants in terms of Vanderwaal's contants – Joule – Thomson – effect – Theory of J-K effect – liquefaction of gases – Dewar's method and K-Onnes method.- properties of liquid Helium I and II.

Sound: Doppler effect – derivation and applications – determination of frequency of alternating current by Sonometer – Ultrasonics – production, properties and applications

UNIT III

Solar Physics: - solar constant – measurement of solar radiations by Pyroheliometer and Pyranometer – general applications of solar energy – flat–plate collector - box type cooker - solar water heaters – solar photo – votaic cells – general applications of solar cells.

UNIT IV

Electricity: Conversion of Galvanometer into Ammeter and voltmeter – figure of merit of a galvanometer – Ballistic Galvanometer – theory and charge of sensitiveness – measurement of capacitance – measurement of Themo EMF and resistance by potentiometer – applications of electromagnetic induction - Transformers – theory, energy loss and applications

UNIT V

Magnetism : Basic concepts of magnetic materials – magnetic properties of Dia, Para and Ferro magnetic materials – Area of (B-H) loop – electric and magnetic circuits – Curie temperature – applications of Ferrites in computer memory

Books for references:

1. Properties of matter and sound – Brijlal subramaniam
2. Properties of matter and sound – R. Murugesan
3. Solar Energy utilization – G.D. Ravi
4. Solar Energy Utilization – Sukhatme
5. Heat and Thermodynamics -- Brijlal subramaniam
6. Heat and Thermodynamics – Narayanamurthi and Nagarathinam
7. Sound -- Brijlal subramaniam
8. Sound – R.L. Seihgal
9. Electricity and magnetism — R. Murugesan
10. Electricity and magnetism — Narayanamurthi and Nagarathinam
11. Electricity and magnetism -- Brijlal subramaniam

ALLIED PHYSICS PRACTICALS
FOR B.SC (MATHS/CHEMISTRY)
2007-2008 BATCH AND ONWARDS

LIST OF EXPERIMENTS (**ANY 12** EXPERIMENTS ONLY)

1. Acceleration due to gravity-Compound pendulum method
2. Moment of inertia – Torsional pendulum method
3. Young's modulus - Uniform bending - Optic lever method
4. Young's modulus - Non-uniform bending - Pin and microscope
5. Rigidity modulus – Static torsion method.
6. Frequency of A.C - Sonometer
7. Thermal conductivity - Lee's disc method.
8. Refractive index of a solid prism - Spectrometer
9. Refractive index of a liquid prism – Spectrometer
10. (i-d) curve - solid prism - Spectrometer
11. Wavelengths of spectral lines – Grating - Normal incidence - Spectrometer
12. Wavelength of spectral lines – Grating - Minimum deviation - Spectrometer
13. Radius of curvature of lens - Newton's rings method.
14. Viscosity of highly viscous liquid - Stoke's method.
15. Surface tension - Drop weight method
16. Low range voltmeter calibration - Potentiometer
17. Low range ammeter calibration - Potentiometer
18. Construction of IC regulated power supply
19. Characteristics of Pn Junction diode
20. Characteristics of Zener diode
21. Construction of Hartley oscillator
22. Construction of Colpitt's oscillator
23. Verification of truth tables of logic gates