BHARATHIDASAN UNIVERSITY
TIRUCHIRAPPALLI- 620 024

Allied Physics

Allied Physics for UG programmes Non Semester
(For the candidates admitted from the academic year 2014 -15 onwards offered through Centre for Distance Education)

Unit I

Properties of matter & Sound

Diffusion :Ficks Law – Coefficient of diffusion – Experimental Determination of Coefficient of Diffusion – Application.

Osmosis : Laws of osmotic pressure – Berkeley and Hartley Method of determining Osmotic pressure – Elevation of Boiling point and depression of Freezing point – Application.

Simple Harmonic Motion – Composition of two simple harmonic motion (1) along a straight line and (2) at right angles to each other – Lissajou's figures and their applications.
Decibel – Phon – Intensity measurement by hotwire microphone method.

Unit II Thermal Physics and Optics

Newton's law of cooling – Verification – Specific Heat Capacity of a lquid by Cooling - Bomb Calorimeter.

Conduction : Coefficient of thermal conductivity – Good and bad Conductor Stefan's law of radiation – Solar Constant – Angstrom's Pyroheliometer – Temperature of the Sun.

Optics :-

UV and IR spectroscopy – Raman Effect – Experimental Arrangement – Application of Raman Effect.

Unit III Electricity & Electrostatics

Coulomb's Law – Gauss Theorem, its application Field due to an infinite long plane, Sphere and Cylinder. Capacitors – Principles of a Capacitor – Capacity of a capacitor – Energy of a charged Capacitor – Sharing of charges and loss of energy.

Kirchoff's Law's and their applications to Wheatstone's network – Condition for bridge balance – Carey Foster's bridge – Laws of electromagnetic Induction – Expression for induced EMF – Self and Mutual Induction – Co-efficient of coupling – Determination of co-efficient of self inductance by Rayleigh's Method.

Unit IV - Atomic Physics & Nuclear Physics

Atom models – Sommerfeld's and Vector atom Models – Pauli's exclusion Principle – various quantum numbers and quantization of orbits.

Nucleus – Nuclear Size – Charge – Mass and Spin – Liquid drop and shell models.

Particle accelerators – Betatron and Proton Synchrotron, Particle Detectors – Cloud Chamber and Bubble Chambers.

Unit V Digital Electronics

Digital Electronics – Decimal – Binary – Octal and Hexa Decimal number systems and their Mutual Conversions -1's and2's complement of a Binary number and Binary arithmetic (Addition, Subtraction, Multiplication and Division) – Binary Subraction by 1's and 2's complement methods – Basic logic gates – AND, OR, NOT, NOR, NAND and EXOR Gates – NAND and NOR as universal building gates – Boolean Algebra – Laws of Boolean Algebra – De Morgan's Theorems – Their verifications using truth tables.

Books for Study and Reference :

1. Statics, Hydrostatics and Hydrodynamics – Narayanamoorthy and Nagarathinam.
2. Sound – Saigal – S.Chand& Co. Delhi.
3. Properties of matter – D.S. Mathur.
4. Heat and Thermodynamics – Brijlal and Subramaniam
5. Optics – Brijlal and Subramaniam
6. Optics – AjoyGhatak – Tata McGraw Hill, Delhi.
7. Allied Physics – I – A.Sundaravelusamy.
8. Magnetism and Electricity – Khare and Srivastava – Atma Ram and Sons – New Delhi.
9. Modern Physics – Murughesan – S.Chand and Co.
10. Digital Principles and their applications – Malvino and Leach – Tata McGraw Hill.
11. Hand Book of Electronics – Gupta and Kumar – PragatiPrakasan.
12. Allied Physics – II – A.Sundaravelusamy.