

ALLIED PHYSICS PAPER FOR B.Sc (MATHS / CHEMISTRY)

ALLIED: PHYSICS I

No. of Credit Hours: 4

UNIT – I: Mechanics

Simple harmonic motion, phase-equations of wave motion-compound pendulum- center of suspension-interchangeability center of oscillation and suspension- Moment of Inertia – Radius of gyration – Angular Momentum – torque – Theorems of M.I - M.I. of uniform rod, disc, circular ring, solid sphere –Kinetic energy of rotating energy- Acceleration of a body rolling down on an inclined plane.

UNIT – II: Gravitation and Elasticity

Law of gravitation–constant G - Kepler's laws-relation between G and g – earth's mass and density -variation of the acceleration due to gravity - orbital velocity - escape velocity - types of moduli - Poisson's ratio relation between y , n & ν – bending of beams - bending moment – cantilever cantilever loaded at one end-supported at two ends and loaded in the middle.

UNIT – III: Sound

Transverse waves – velocity along a stretched string-laws of transverse vibration of strings-verification of laws-Melde's experiment-ultrasonics-generation - piezo-electric effect- - detection of ultrasonics-applications-determination of velocity of sound in a liquid

UNIT – IV: Optics

Defects in images -chromatic aberration-spherical aberration- Determination of refractive index using spectrometer -Newton's rings-determination of wavelength and refractive index of liquid-plane transmission grating-resolving power of diffraction grating-determination of wavelength- Nicol prism –double refraction

UNIT – V: Basic Electronics

semi conductors - intrinsic and extrinsic types -p-n junction-forward bias, reverse bias-characteristics - full wave rectifier, zener diode, tunnel diode, photo diode, LED -transistor-CE and CB characteristics-transistor amplifier.

BOOKS FOR STUDY:

1. A.S.Vasudeva, Modern Engineering Physics, S.Chand and CompanyLtd., 1988.
2. V.K. Mehta, Principles of Electronics, S.Chand and CompanyLtd., 2009.

ALLIED PHYSICS PAPER II

No. of Credit Hours: 4

UNIT- I Modern physics:

Einstein's photo electric equation – verification of Einstein's photo electric equation by Millikan's experiment – photo electric cells – applications

Wave mechanics: De Broglie concept of matter waves – characteristics and calculation of De Broglie wave length -Study of De Broglie matter wave by G.P.Thomson experiment.

UNIT- II Nuclear physics:

Nuclear forces –characteristics - nuclear structure by liquid drop model – Binding energy – mass defect – particle accelerators – cyclotron and betatron – nuclear Fission and nuclear Fusion – introduction to elementary particles – Leptons, Mesons and Baryons

UNIT III Laser physics:

Principles of laser– population inversion – meta stable state – conditions for laser actions - Types –Nd-Yag – Helium – neon laser – applications of lasers – Raman effect – Raman shift – stokes and anti stokes lines

UNIT IV Semiconductor physics:

Volt – Ampere Characteristics of P-N junction Diode – Zener diode – applications of Zener diodes - Volt – Ampere Characteristics of FET, UJT and SCR – Principles of LED and LCD – Frequency Modulation and Amplitude modulation –principles and applications of RADAR.

UNIT V Digital Electronics:

Number systems – conversion of binary into decimal – conversion of decimal to binary – binary addition and subtraction – Basic logic gates – NAND and NOR as an universal logic gates – Demorgan's theorems – Boolean algebra – applications of Demorgans theorems – Half adder and full adder circuits.

BOOKS FOR REFERANCE

1. Modern physics – R. Murugesan
2. Engineering physics – Gaur & Gupta
3. Engineering physics – M. Arumugam
4. Laser Physics – Thiagarajan
5. Principles of Electronics – V.K. Metha
6. Basic Electronics – B.L. Theraja
7. Fundamentals of digital computers – Bartee
8. Digital principles and Applications – Malvino & Leech

ALLIED PHYSICS PRACTICALS FOR B.SC (MATHS/CHEMISTRY)
2014-15 BATCH AND ONWARDS

LIST OF EXPERIMENTS (ANY 10 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. Characteristics of Pn Junction diode
17. Characteristics of Zener diode
18. Verification of truth tables of logic gates.