

APPLIED PHYSICS – I

Paper Code: ETPH – 103
Paper : Applied Physics – I

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INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

Objective: The objective of the paper is to facilitate the student with the basics of Applied Physics aspects that are required for his understanding of basic physics.

UNIT I

Interference: Introduction, Interference due to division of wave front: Fresnel's Biprism, Interference due to division of amplitude: wedge shaped film, Newton's rings.

Diffraction: Introduction, Difference between Fresnel and Fraunhofer diffraction, Single slit diffraction, Transmission diffraction grating, Absent spectra.

[T1], [T2](No.
of Hrs. 8)

UNIT II

Polarization: Introduction, Uniaxial crystals, Double refraction, Nicol prism, Quarter and half wave plates, Theory of production of plane, circularly and elliptically polarized lights, Specific rotation, Laurents half shade polarimeter.

Laser: Spontaneous and stimulated emissions, Einstein's coefficients, Laser and its principle, He-Ne laser.

Fibre optics: Introduction, Single mode fibre, Step index and graded index multimode fibres, Acceptance angle and numerical aperture.

[T1], [T2](No.
of Hrs. 8)

UNIT III

Theory of Relativity: Introduction, Frame of reference, Galilean transformation, Michelson-Morley experiment, Postulates of special theory of relativity, Lorentz transformations, Length contraction, Time dilation, Mass energy relation

Ultrasonics: Introduction, Production of ultrasonics by magnetostriction and Piezoelectric methods, Applications.

[T1], [T2](No.
of Hrs. 8)

UNIT IV

Nuclear Physics: Introduction, Radioactivity, Alpha decay, Beta decay, Gamma decay, Q value, Threshold energy, Nuclear reactions, Nuclear fission: Liquid drop model, Nuclear fusion, Particle accelerators: Linear accelerator, Cyclotron, Radiation detectors: Ionization chamber, Geiger Mueller Counter.

[T1](No. of
Hrs. 8)

Text Books:

- [T1]. Arthur Beiser, 'Concepts of Modern Physics', [McGraw-Hill], 6th Edition 2009
[T2]. A. S. Vasudeva, 'Modern Engineering Physics', S. Chand, 6th Edition, 2013.

Reference Books

- [R1]. A. Ghatak 'Optics', TMH, 5th Edition, 2013

- [R2].G. Aruldhas 'Engineering Physics' PHI 1st Edition, 2010.
- [R3].Fundamentals of Optics : Jenkins and White , Latest Edition
- [R4].C. Kittle, "Mechanics", Berkeley Physics Course, Vol.- I.
- [R5].Feynman " The Feynman lectures on Physics Pearson Volume 3 Millennium Edition, 2013
- [R6].Uma Mukhrji 'Engineering Physics' Narosa, 3rd Edition, 2010.
- [R7].H.K. Malik & A. K. Singh 'Engineering Physics' [McGraw-Hill], 1st Edition, 2009.