

Paper-IV: 3164, PHYSICS PRACTICALS

Note: Students are required to do any sixteen experiments from two sections in all taking eight experiment from each section. One experiment from section A and ten from section B shall be set in the examination paper.

The distribution of marks in the practical examination will be as follows:

Two experiments 48 Marks (one from Section A and one from section B).

In case Section C is offered one question from Section-A/Section B and One from Section C should be set.

For each experiment, distribution of marks will be as follows.

Figure : 3

Formula/Theory : 3

Observation : 10

Calculation (including error) and Result : 6

Precautions : 2

(ii) Viva voce 12

(iii) Records 15

Total 75 Marks

LIST OF EXPERIMENTS

(i) Error analysis, identification of various sources of errors in the experiments, quoting results with errors must be followed in each experiment

(ii) Students should have access to Internet and Computation facilities. College should install at least one computer in final year Physics Laboratory. Atleast two simulation experiments must be conducted. Students must be exposed to resources, java applets available on website.

Section-A

1. Determination of e/m , specific charge of an electron by helical method.
2. Determination of Planck's constant by photo conductivity method.
3. Determination of refractive index of air using Jamin's interferometer.
4. Determination of wave length of a monochromatic light using Michelsons Interferometer.

5. Verification of Fresnel's law of reflection by a plane surface.
6. To analyze elliptically polarized light by photoelectric cell/Babinet's compensator.
7. Determination of viscosity of a fluid by rotation viscometer.
8. Study of ferromagnetic material by plotting hysteresis curve of the specimen by Ballistic galvanometer/ CRO.
9. Study of Photoelectric effect and to determine electronic charge and work function
10. Determination of ultrasonic wave velocity in a liquid
12. Determination of Surface tension by Ferguson-Kennedy method.
13. Wave length of spectral lines of Hg lamp by Constant Deviation Spectrometer (Visual)
14. To determine value of Boltzmann constant using V-I characteristic of PN diode.
15. To determine work function of material of filament of directly heated vacuum diode.
16. To determine value of Planck's constant using LEDs of at least 4 different colours.
17. To determine the ionization potential of mercury.
18. To determine the wavelength of H-alpha emission line of Hydrogen atom.
19. To determine the absorption lines in the rotational spectrum of Iodine vapour.
20. To study the diffraction patterns of single and double slits using laser source and measure its intensity variation using Photosensor and compare with incoherent source – Na light.
21. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
22. To setup the Millikan oil drop apparatus and determine the charge of an electron.

Section-B

1. Study frequency response of a common emitter current series negative feedback amplifier.
2. Study the characteristics of a Field effect Transistor and to determine mutual conductance, output resistance and voltage gain.
3. Study voltage wave forms of a transistorized monostable and bistable multivibrator.
5. Study clipping and clamping using diode.
6. Study detection efficiency of a diode by direct method.
7. Study amplitude modulation with the help of CRO

8. Study frequency response of an inverting and non-inverting operational amplifier
9. Study variation of output power with load impedance in Push-Pull amplifier.
10. Study of Hartley oscillator and determination of Q of a standard coil
11. Study frequency response of a transformer coupled amplifier.
12. Study of field emission as a tunneling phenomenon.
13. To determine the Coupling Coefficient of a Piezoelectric crystal.
14. To measure the Dielectric Constant of a dielectric Materials with frequency
15. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR)
16. To determine the refractive index of a dielectric layer using SPR
17. To study the PE Hysteresis loop of a Ferroelectric Crystal.
18. To determine the Hall coefficient of a semiconductor sample.

SECTION-C

(For colleges having Computer facilities)

1. Numerical simulation of wave functions of simple harmonic oscillator.
2. Computation of wave function and their interpretation for various potentials.
3. Computation of transmission coefficients for barriers of different shapes.
4. Simulation of wave functions for a particle in a critical box.
5. Random numbers in computer Simulation
6. L-C-R Circuit
7. Motion of charged particles in Electric and Magnetic fields