

Syllabus

PANJAB UNIVERSITY, CHANDIGARH

B.Sc Part-II

SEMESTER-III

PHYSICS PRACTICAL

The students are required to perform Nine experiments choosing either of the Units I or Unit II in each semester. The unit of experiments allocated in the first semester cannot be repeated in second semester. The college must keep a record of the Unit allocated to each student. In the second semester examination, the students are expected to bring their practical note books of both the semesters.

General Guidelines for Physics Practical Examinations :

Total : 25 Marks

1. The distribution of marks is as follows :
 - (i) One full experiment out of section-A requiring the student to take some data, analyse it and draw conclusions. (Candidates are expected to state their results with limits of error). 10
 - (ii) One exercise based on experiment or Computer Programming from the Unit assigned to the student for the semester. 4
 - (iii) Viva-Voce. 5
 - (iv) Record (Practical file) 3
 - (v) Internal Assessment. 3

Note for Examiners :

2. The marks scored under each head must be clearly written on the answer sheet.
3. There will be one session of 3 hours duration. The paper will have two sections. Section-A will consist of 4 experiments from each of Units I and Unit II, out of which an examinee will mark 3 experiments from either of units and one of these is to be allotted by the external examiner.
4. Section-B will consist of exercises/computer based activities which will be set by the external examiner on the spot. The length of the exercises should be such that any of these could be completed in one hour.
5. The examiner should take care that the experiment allotted to an examinee from section-A and exercise allotted from section-B are not directly related to each other.
6. Number of candidates in a group for practical examination should not exceed 20.
7. In a single group, no experiment be allotted to more than three examinees in the group.

LIST OF EXPERIMENTS :

UNIT-I

A. Statistical Physics and Thermodynamics :

- I. To study adiabatic expansion of a gas.
- II. To measure thermal expansion of crystal using interference fringes.
- III. To measure thermal conductivity in poor conductor by Lee's method.
- IV. Thermo emf calibration, comparison.
- V. Total radiation law, temperature dependence of radiation.
- VI. To study Probability distribution using coloured dice, coins.

B. Optics and Lasers :

- VII. To determine the refractive index of a liquid using spectrometer.
- VIII. To determine the Cauchy's constants.
- IX. To study the refractive index of a doubly refracting prism.
- X. Study of rotation of plane of polarization with a polarimeter.
- XI. To determine the wavelength of a given light using biprism.

EXERCISES :

1. To measure the thermo e.m.f.
2. To determine the heating efficiency of an electric kettle with varying voltages.
3. To measure the angle of rotation of plane of polarization for the given liquid.
4. To determine the least count and setup the spectrometer for minimum deviation position of the prism.

Computer Based Activities : Elementary C language programs.

1. Motion of particle in a central force field.
2. Calculation of days between two dates of a year.
3. To check if triangle exists and the type of the triangle.

UNIT-II

C. Optics and Lasers :

- I. To determine the wavelength and dispersive power using plane diffraction grating (use Hg source).
- II. To determine the resolving power of a telescope.
- III. To determine the resolving power of a grating.
- IV. Set up Newton's rings to determine wavelength of sodium light.
- V. To measure an inaccessible height using sextant.
- VI. To determine the principal points of a lens system.
- VII. To determine the divergence and wavelength of a given laser source.

D. Quantum Physics :

- VIII. To study the Photoelectric effect and determine the value of Planck's constant.
- IX. To study the gas discharge spectrum of hydrogen.
- X. To study the absorption spectra of iodine vapours.
- XI. To determine the ionization potential of mercury.

EXERCISES :

- 1. To measure the diameter of Newton's rings.
- 2. Study of variation of light intensity using photovoltaic cell/inverse square law.
- 3. To determine the angle of wedge using interference method.
- 4. To measure the angle of elevation of a tall building.

Computer Based Activities : Elementary C language programs.

- 1. To find the sum of the sine and cosine series and print out the curve.
- 2. To find Sum and Product of Matrices,
- 3. Motion of a projectile using computer simulation.

SEMESTER-IV

General Guidelines for Physics Practical Examinations :
Same as in Semester-III

LIST OF EXPERIMENTS :

UNIT-I

A. Statistical Physics and Thermodynamics :

- I. To study adiabatic expansion of a gas.
- II. To measure thermal expansion of crystal using interference fringes.
- III. To measure thermal conductivity in poor conductor by Lee's method.
- IV. Thermo emf calibration, comparison.
- V. Total radiation law, temperature dependence of radiation.
- VI. To study Probability distribution using coloured dice, coins.

B. Optics and Lasers :

- VII. To determine the refractive index of a liquid using spectrometer.
- VIII. To determine the Cauchy's constants.
- IX. To study the refractive index of a doubly refracting prism.
- X. Study of rotation of plane of polarization with a polarization.
- XI. To determine the wavelength of a given light using biprism.

EXERCISES :

1. To measure the thermo e.m.f.
2. To determine the heating efficiency of an electric kettle with varying voltages.
3. To measure the angle of rotation of plane of polarization for the given liquid.
4. To determine the least count and setup the spectrometer for minimum deviation position of the prism.

Computer Based Activities : Elementary C language programs.

1. Motion of particle in a central force field.
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UNIT-II

C. Optics and Lasers :

- I. To determine the wavelength and dispersive power using plane diffraction grating (use Hg source).
- II. To determine the resolving power of a telescope.
- III. To determine the resolving power of a grating.
- IV. Set up Newton's rings to determine wavelength of sodium light.
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EXERCISES :

1. To measure the diameter of Newton's rings.
2. Study of variation of light intensity using photovoltaic cell/inverse square law.
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4. To measure the angle of elevation of a tall building.

Computer Based Activities : Elementary C language programs.

1. To find the sum of the sine and cosine series and print out the curve.
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