

Syllabus

Panjab University, Chandigarh

B.Sc. III (Semester-V)

PHYSICS PRACTICALS

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 fifth semester cannot be repeated in sixth semester. The college must keep a record of the Unit allocated to each student. In the sixth 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 :

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| (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 :

- The marks scored under each head must be clearly written on the answer sheet.
- There will be one session of 4 hours duration. The paper will have two sections. Section–A will consist of 4 experiments from each of Unit 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.
- 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.
- 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.
- Number of candidates in a group for practical examination should not exceed 12.
- In a single group, no experiment be allotted to more than three examinees in the group.

SEMESTER–V

List of Experiments :

Note : Each student should perform *at least Nine experiments* in the laboratory.

UNIT–I

I. CONDENSED MATTER PHYSICS :

- (i) Measurement of reverse saturation current in $p-n$ junction diode at various temperatures and to find the approximate value of energy gap.

- (ii) To draw forward and reverse bias characteristics of a $p-n$ junction diode and draw a load line.
- (iii) Study of a diode as a clipping element.
- (iv) To measure the magnetic susceptibility of FeCl_3 solution by Quincke's method.

II. ELECTRONICS AND SOLID STATE DEVICES :

- (v) To study the response of RC-circuit to various input voltages (square, sine and triangular).
- (vi) To measure the efficiency and ripple factors for (a) Half-wave, (b) Full wave, and (c) Bridge rectifier circuits.
- (vii) To study the reduction in the ripples in the rectified output with RC, LC and π -filters.
- (viii) To draw the characteristics of a Zener diode and LED using constant current source.
- (ix) To study the stabilization of output voltage of a power supply with Zener diode.
- (x) To set up an oscillator and study its output on CRO for different V values.
- (xi) To study the characteristics of a thermistor and find its parameters.

Exercise :

1. Any one exercise based on the above given experiments.

Computer Based Activities : Elementary C language programs.

1. Print a 2D array in spiral form.
2. To find determinant of a given matrix.
3. To find inverse of a given matrix.
4. To interpolate the data values from the given set.

UNIT-II

I. CONDENSED MATTER PHYSICS :

- (i) To trace the $B-H$ curves for different materials using CRO and find the magnetic parameters from these.
- (ii) To find the conductivity of a given semi-conductor crystal using four probe method.
- (iii) To determine the Hall coefficient for a given semiconductor.
- (iv) To measure and plot Common Emitter Characteristics of a transistor (pnp or nnp).
- (v) To plot Common Base Characteristics and determine h -parameters of a given transistor.
- (vi) To draw output and mutual characteristics of an FET and determine its parameters.
- (vii) To study the gain of an amplifier at different frequencies and to find band-width and gain-band-width product.

III. Nuclear Physics :

- (viii) To draw the Plateau of a GM counter and find its dead time.
- (ix) To study the statistical fluctuations using GM counter.
- (x) To study the absorption of beta-particles and determine the end point energy using GM counter. Also determine the absorption coefficient (for aluminium) from it.
- (xi) Verification of Rutherford Scattering experiment-mechanical analogue.

Exercise :

- I. Any one exercise based on the above given experiments.

Computer Based Activities : Elementary C language programs.

1. To solve simultaneous equations by elimination method.
2. Fitting a straight line or a simple curve of a given data.
3. Convert a given integer into binary and octal/hexadecimal system and vice versa.