

T G C D S  
M.Sc. Semester-III Examination, 2023  
PHYSICS  
PAPER: PHS 396A  
(Solid State Physics Special Practical - I)

Full Marks: 50

Time: 3 Hours

Students should perform any one of the listed experiments (the choice will be given by lottery system):

Marks Distribution

Time: 3 hours	Max Marks: 50
1.Theorem and working Formula	8 Marks
2.Tabulation and graph plotting	(10 + 5) = 15 Marks
3. Calculations – Result and Error analysis	(5 + 3) = 8 Marks
4. Discussions, Precautions and applications	(2 + 2) = 4 Marks
5. Viva - Voce	10 Marks
6. Record	5 Marks

1. Find the ferroelectric Curie temperature ( $T_C$ ) of the given unknown polycrystalline ferroelectric sample, using dielectric measurement.  
Given: Area (A): 8 x 6 mm, Thickness (t): 1.42 mm, Permittivity of Space ( $\epsilon_0$ ):  $8.85 \times 10^{-12}$  F/m or  $8.85 \times 10^{-3}$  pf/ mm.
2. Study the following characteristics of a given solar cell-
  - (i) Illumination characteristics
  - (ii) Current Voltage Characteristics
  - (iii) Power Load characteristicsHence find the best external load for the given solar cell.
3. Determine the Hall coefficient of a given semiconductor at room temperature. Hence show the variation of Hall coefficient with temperature.
4. Study the I-V characteristics of Diac & Triac both in forward and reverse directions.
5. Study of Hysteresis loop of magnetic materials by using Hysteresis Tracer and plot the loss vs frequency graph.

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