MAN
ACADEMY of HIGHI

DEPARTMENT OF SCIENCES

Second Semester M.Sc. (Physics)

Lab End Sem Examination – May 2023

PHY 5255 : Physics Lab - III

Duration: 3 hours **Max marks:** 40

Note : *Perform one experiment specified below. Write the formula with the explanation of terms, their units, circuit/ray diagrams (if any), tabular columns, and qualitative plot of graphs of the experiment allotted to you in the first 20 minutes. Perform the experiment showing at least one reading of each measurement and report the result.*

1. a) Determine Hall Coefficient and Charge carrier density of the given semiconductor. b) Study the dependence of Hall Coefficient on temperature.
2. Measure the Lande's g-factor in Diphenyl-picryl-hydrazyl (DPPH) using electron spin resonance spectrometer.
3. Determine the Fermi energy of Copper. Also calculate Fermi temperature and Fermi speed.
4. Determine the coercivity, retentivity and saturation magnetization of magnetic materials using hysteresis loop tracer.
5. Determine the diamagnetic susceptibility of (a) Glass and (b) water by Gouy's method.
6. Determine the paramagnetic susceptibility of Nickel Ammonium Sulphate by Gouy's method.
7. Determine energy gap of a semiconductor by four probe method.
8. Study the variation of electrical resistance of amorphous solid materials with temperature and determine the activation energy for conduction.
9. Determine the open circuit voltage V_{OC}, short circuit current I_{SC}, conversion efficiency η, Maximum power point power P_{MPP} and fill factor FF for various positions of the solar cell from the source.
10. Determine the activation energy of Frenkel defects in copper by quenching method.

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