

Total Pages -07/PG/2S/PHS/296/21

**2021**

**M.Sc.**

**2nd Semester Examination**

**PHYSICS**

**Paper - PHS-296**

*Full Marks: 50*

*Time: 3 Hours*

The figures in the right hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

**(Advance Practical - II)**

**Marks Distribution:**

(1) Experiment: 40

(2) Viva-voce: 10

<b>Total = 50</b>
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Perform any *one* from the following experiments and give answers to the corresponding questions within the scheduled time.

(Turn Over)

1. Determine Planck's constant using photo-electric effect. Keep the light intensity at maximum and the source distance  $r = 25$  cm.
  - (a) Theory and circuit diagram
  - (b) Experimental Procedure
  - (c) Discussion
  
2. Determine Hall coefficient of a given sample and calculate its carrier concentration. Sample thickness  $z = 0.5$  mm.
  - (a) Theory and circuit diagram
  - (b) Experimental Procedure
  - (c) Discussion
  
3. Determine  $e/m$  ratio of electron using its cyclotron motion.
  - (a) Theory and circuit diagram
  - (b) Experimental Procedure
  - (c) Discussion
  
4. Study the variation of LDR resistance with light intensity and distance.
  - (a) Theory and circuit diagram
  - (b) Experimental Procedure
  - (c) Discussion

- 5.** Study the variation of resistivity of semiconductor with temperature and hence find out the band gap ( $E_g$ ). Channel length ( $L$ ) = 2 mm and area
- (g) Plots of LDR resistance ( $R$ ) with  $r^2$  from data (f) and calculation of the slopes
- (a) Theory and circuit diagram
  - (b) Experimental Procedure
  - (c) Discussion
- 6.** Determine Curie temperature and Curie constant of a given ferroelectric sample having cylindrical structure with diameter ( $d$ ) = 11 mm and thickness ( $t$ ) = 2 mm.
- (a) Theory and circuit diagram
  - (b) Experimental Procedure
  - (c) Discussions