



**THE AMERICAN COLLEGE, MADURAI**  
(An Autonomous Institution Affiliated to Madurai Kamaraj University)  
Re-accredited (2<sup>nd</sup> Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale  
**Backlog Arrear Examination, March 2021**

**PGP 5523 Condensed Matter Physics II**

**Max:75**

**Time: 3hrs**

**Part-A**

**Answer any FIVE questions**

**(5x15=75)**

1. Obtain the dispersion relation for an electromagnetic wave passing through a solid.
2. Derive LST equation.
3. Discuss the Langevin theory of paramagnetism
4. What is Hall effect and obtain the expression for Quantum Hall resistance
5. i)Write short notes on Type I and Type II superconductors. ii) Give an account on BCS theory
6. Discuss AC Josephson effect and obtain the expression for the frequency of the current produced.
7. Obtain the expression for the equilibrium concentration of Frenkel defects in ionic crystals

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