THE AMERICAN COLLEGE, MADURAI

(AN AUTONOMOUS INSTITUTION AFFILIATED TO MADURAI KAMARAJ UNIVERSITY)

Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Backlog Arrear Examination, March 2021

Course Code: PHS 3455/PHS 3668 **Time: 3 Hours**

Course Title: Solid State Physics **Max. Mark: 75**

Answer any FIVE questions: **5 X 15 =75 marks**

1. Define crystal structure. Classify the different types of crystal structure systems with neat diagrams.
2. Derive and explain the reciprocal lattice for a Simple cubic (SC)&Body centered cubic (BCC) lattice.
3. Derive an expression for binding energy of an ionic crystal and obtain the expression for Madelung constant.
4. On the basis of free electron theory, derive an expression for electrical conductivity?
5. Explain Bloch theorem with relevant derivations
6. What is Meissner effect? Obtain London equations for superconductors.
7. What is meant by D.C Josephson effect? Derive the expression for the super current in D.C. Josephson effect

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