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Reg. No.

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III Semester M.Sc. Degree Examination, April/May - 2022

PHYSICS

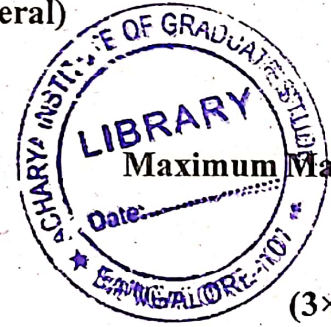
Condensed Matter Physics (General)

(CBCS Scheme - 2019-20)

Paper - 304

Time : 3 Hours

Instructions to Candidates :



(3×15=45)

Answer all questions.

1. a) Explain primitive and non-primitive lattices.  
b) Define Reciprocal lattice. Explain its construction and properties. (5+10)  
(OR)
2. a) What are structure factor and atomic factor ? Explain.  
b) Obtain Laue's condition for diffraction of X-rays by crystals and express Laue's equations in three dimensions. (5+10)
3. a) Explain Type-I and Type-II superconductors with examples.  
b) What is Meissner effect? Discuss the BCS theory in superconductors. (7+8)  
(OR)
4. a) Distinguish between intrinsic and extrinsic semiconductors with examples.  
b) Discuss Hall Effect experiment in semiconductors and mention its importance. (7+8)
5. a) Explain the properties, structure and applications of ferroelectric materials.  
b) Obtain an expression for electronic and ionic polarizabilities. (7+8)  
(OR)
6. a) Explain the Langevin theory of Diamagnetism.  
b) Discuss Weiss molecular field theory of Ferromagnetism. (7+8)

[P.T.O.]





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7. Answer any Five of the following questions.

(5×5=25)

- a) Explain in nomenclature of crystal directions and planes.
- b) Explain the method of analysis of X-ray diffraction pattern
- c) Explain AC Josephson effect in superconductors.
- d) Obtain expression for carrier concentration of intrinsic semiconductor.
- e) Derive an expression for Clausius-Mossotti relation.
- f) Write a note on ferrimagnetism.

