62124

Reg. No. | | | | | | | | |

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

PHYSICS

Condensed Matter Physics (General)

(CBCS Scheme - 2019-20)

Paper - 304

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates :

Answer all questions. **(3×15=45)**

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.

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 Clausus-Mossotti relation.

f) Write a note on ferrimagnetism.