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SB—58—2022

FACULTY OF SCIENCE

B.Sc. (Third Year) (Fifth Semester) EXAMINATION

MAY/JUNE, 2022

(CBCS/New Pattern)

PHYSICS

Paper XIII

(Solid State Physics)

(Monday, 13-06-2022)

Time : 10.00 a.m. to 12.30 p.m.

Time— 2½ Hours

Maximum Marks—40

N.B. :— All questions are compulsory.

1. Derive an expression for specific heat of solids by Emstein's theory. Discuss its variation at high temperature. 15

Or

(a) What are the types of bondings ? Explain formation of Hydrogen bonding in solids. 8

(b) Describe Drude-Lorentz theory. Derive an expression for thermal conductivity. 7

2. What are the basic crystal systems in three dimensions ? Explain in detail Face Centered Cubic (FCC) structure. 15

Or

(a) Derive an expression for thermal and electrical conductivity, hence obtain Wiedemann-Franz relation. 8

P.T.O.

- (b) Explain rotating crystal method for determination structure of solids. 7
3. Write short notes on any *two* of the following : 10
- (a) Point groups and space groups.
 - (b) Formation of metallic bond.
 - (c) Classical theory of lattice heat capacity (Dulong-Petit's law)
 - (d) Electrical conductivity and Ohm's law.