

This question paper contains 2 printed pages]

**PA—35—2024**

**FACULTY OF SCIENCE**

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

**MARCH/APRIL, 2024**

**(CBCS/New Pattern)**

**PHYSICS**

**Paper XIII**

**(Solid State Physics)**

**(Monday, 15-04-2024)**

**Time : 10.00 a.m. to 12.00 noon**

*Time—2 Hours*

*Maximum Marks—40*

*Note :— (i) All questions are compulsory.*

*(ii) Figures to the right indicate full marks.*

1. Explain in detail translation, rotation, reflection and inversion operations. 15

*Or*

- (a) Explain in brief hydrogen bonding and van der Waals' bonding.
- (b) What is Bragg's law ? Describe in detail Bragg's equation.

P.T.O.

2 Derive an expression for Einstein's theory of heat capacity and explain its variations at low and high temperatures. 15

*Or*

(a) Discuss the thermionic emission and escape of electrons from metals. 8

(b) Explain in detail thermal conductivity of solids. 7

3. Attempt any *two* : 10

(i) Write a short note on point group symmetry

(ii) Explain the phenomenon of X-ray diffraction.

(iii) Describe the limitations of the Debye model.

(iv) Enlist the outstanding properties of metals.