

Roll No. ....

**Y – 3120 (A)**  
**M.Sc. (Second Semester) (SPECIAL) EXAMINATION,**  
**August 2021**  
**(SECOND CHANCE)**

**PHYSICS**

Third Paper – 203

**CONDENSED MATTER PHYSICS-I**

*Time : Three Hours*

*Maximum Marks : 85*

*Minimum Pass Marks : 29*

**Note**—Attempt *all* questions.

1. What is a geometric and atomic structural factor ? Derive an expression for atomic scattering factor. Explain its significance. 17
2. What is a phonon ? Derive the vibrational modes of a diatomic linear lattice. Name the two different branches of the dispersion relation curve. 17
3. What is periodic potential ? Discuss Kroning-Penny model. 17
4. What do you mean by Rectification ? Explain how  $p$ - $n$  junction diode can be used as a full wave rectifier. 17
5. What do you mean by optical reflectance ? Discuss the phenomenon of absorption of light in metals and semiconductors. 17