Jashore University of Science and Technology

Department of Physics

Bachelor of Science with Honours in Physics

2nd semester of 3rd year (2023–2024)

Course code: PHY 3205 **Course title: Solid State Physics I**

Class test no.: 1 **Date: 04 November 2025**

Roll:	

1. What is a Bravais lattice? How many types of Bravais lattices exist in 3D? [4]

2. Define atomic facking fraction. Calculate the atomic packing fraction of a FCC lattice. [5]

3. What are Miller indices? Draw (010), (101) and (121) plane of a simple cubic lattice. [5]

4. Define the term Reciprocal Lattice. Show that the reciprocal lattice of a BCC lattice is a FCC. [6]

5. Determine the angle at which first-order Bragg diffraction occurs from the (111) plane in a simple cubic lattice with a unit cell of side $a = 3.238$ Å, using chromium K_α radiation of wavelength $\lambda = 2.29$ Å. [5]