Jashore University of Science and Technology

Bachelor of Science in Electrical and Electronic Engineering

1st semester of 3rd year, Academic session: 2024–2025

Course no.: PHY 3101 **Course title: Electrical Engineering Materials**

Class test no.: 02 **Date: 21 October 2025**

Roll:	

1. What is atomic packing fraction? Calculate the atomic packing fraction of a BCC lattice. [4]

2. Draw (010), (101), (111) and (112) plane of a simple cubic lattice. [6]

3. Show that the reciprocal lattice of a BCC lattice is an FCC lattice. [5]

4. Na is a monovalent metal (BCC) with a density of 0.9712 g cm^{-3}. Its atomic mass is 22.99 g mol^{-1}. The drift mobility of electrons in Na is 53 cm^2 V^{-1} s^{-1}. Calculate the electrical conductivity of Na and compare this with the experimental value of 2.1×10^7 Ω^{-1} m^{-1} and comment on the difference. [5]