

Jashore University of Science and Technology

Bachelor of Science in Electrical and Electronic Engineering

1st semester of 2nd year, Academic session: 2022–2023

Course no.: **EEE 2105**

Course title: Electrical Engineering Materials

Class test no.: 02

Date: March 18, 2024

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1. Draw a 2D triangular lattice and write down the translational vector of the lattice. [5]
2. Calculate the atomic packing fraction of a BCC lattice. [5]
3. Draw (010), (101) and (111) plane of a simple cubic 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 $53 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$. Calculate the electrical conductivity of Na and compare this with the experimental value of $2.1 \times 10^7 \Omega^{-1} \text{ m}^{-1}$ and comment on the difference. [5]