Jashore University of Science and Technology

Department of Physics

Bachelor of Science with Honours in Physics
1st semester of 3rd year (2025–2026)
Course code: 053313 PHY 3107
Course title: Solid State Physics I
Assignment no.: 1 Date: 11 October 2026

Deadline for submission: 25 October 2026, 10:00 PM

1. What are crystal defects? Classify the different types of crystal defects. Why are crystal defects important in determining the properties of materials?

2. How do point, line, and plane defects impact on material properties? How does temperature influence defect concentration?

3. Explain different types of point defects (vacancies, interstitials, substitutional defects). Compare Schottky and Frenkel defects in ionic solids.

4. Explain the structure of edge dislocation and screw dislocation. Compare edge and screw dislocations in terms of geometry.

5. What are plane defects? Discuss different types such as grain boundaries, twin boundaries, and stacking faults.

6. What are color centers? Explain F-centers with an energy-level diagram. How do color centers form in ionic crystals? Discuss their optical consequences.