Jashore University of Science and Technology

Bachelor of Science in Electrical and Electronic Engineering
1st semester of 3rd year, Session: 2023–2024
Course title: Electrical Engineering Materials
Course no.: 053311 PHY 3101
Assignment no.: 01 **Date: 31 October 2026**

Last date of submission: 27 November 2026 at 10:00 AM

1. Write a short note on Hall effect. Discuss how the Hall effect could be used to obtain information on free charge density in a conductor. (Hint: Consider how drift velocity and current are related.)

2. Write down the mathematical expression of Fermi–Dirac distribution function. Explain its significance in details with proper sketch.

3. Define density of states. Drive an expression to calculate the energy density of states.

4. What are dielectric materials? Show that $\varepsilon_r = 1 + \dfrac{N\alpha_e}{\varepsilon_0}$.

5. How magnetic materials are classified? Explain the properties of each type with example.

6. What are superconductivity and Meissner effect? Write a short note on type II superconductors.