Jashore University of Science and Technology

Bachelor of Science Electrical and Electronic Engineering

1st semester of 1st year

Session: 2023 – 2024

Course no.: PHY 1101 **Course title: Physics**

Assignment no.: 01 **Date: 17 January 2025**

Deadline for submission: 31 January 2025, 10:00 PM

1. What is the binding energy of a nucleus? Calculate the binding energy and density of He nucleus. Given that the measured mass of He is 4 a.m.u. and $R_0 = 1.4$ fm.

2. Discuss the functions of different essential parts of a nuclear reactor with a rough sketch.

3. What is interference of light? Under what conditions interference of light take place?

4. In case of Young's double slit experiment, show that $I = 4I_0 \cos^2 \frac{\delta}{2}$, where the symbols carry usual meaning.

5. Define diffraction of light. What is Fresnel and Fraunhofer class of diffraction?

6. For single slit diffraction show that $I = I_0 \left(\frac{\sin\beta}{\beta}\right)^2$, where the symbols carry usual meaning.

7. Define polarization of light. Explain plane of polarization and plane of vibration.

8. How can elliptically and circularly polarized light be formed from plane polarized light?

9. What are the thermodynamic functions? Find the differential equations of the thermodynamic functions.

10. Derive the Maxwells relations related to the thermodynamic functions H and G.

11. Define efficiency of an engine. State and prove the Carnot's theorem.

12. Write down important features of the Carnot cycle. Prove that the efficiency of a Carnot cycle is temperature dependent.