# Jashore University of Science and Technology
## Department of Physics
### Bachelor of Science with Honours in Physics
### 1st semester of 3rd year, Academic session: 2024–2025

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| **Course code.: PHY 3103** | **Course title: Quantum Mechanics I** |
| **Assignment no.: 01** | **Date: 12 January 2026** |

### Last date of submission: 16 January 2026 at 08:00 PM

**1.** What is the basic postulate of the Bohr model regarding electron orbits? Why does the electron not spiral into the nucleus in Bohr's model?

**2.** What does it mean when we say "energy is quantized"? Why do atoms emit photons of only specific wavelengths?

**3.** Why are expectation values useful in quantum mechanics? What is the difference between a measurement result and an expectation value?

**4.** What is the momentum space wave function? Can a wave function be normalizable in both position and momentum space?

**5.** State Ehrenfest's theorem for position and momentum. What does Ehrenfest's theorem imply in the classical limit?

**6.** Prove that the product of two Hermitian operator is a Hermitian operator if they commute.