

Jashore University of Science and Technology

Bachelor of Science in Electrical and Electronic Engineering

1st semester of 3rd year, Academic session: 2024–2025

Course no.: PHY 3101

Course title: Electrical Engineering Materials

Class test no.: 01

Date: 21 September 2025

Roll:	
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1. Is $\psi(x) = Axe^{-x^2}$ an acceptable wave function in quantum mechanics? Justify your answer. [5]

2. Write down the postulates of quantum mechanics. [5]

3. What is quantum tunneling? Explain with a suitable example. [5]

4. Calculate the expectation value of position, $\langle x \rangle$, for the following wave functions and interpret the physical meaning of the result.

$$\psi(x) = \sqrt{\frac{2}{a}} \sin\left(\frac{\pi x}{a}\right), \quad 0 < x < a \text{ and zero elsewhere.} \quad [5]$$