

Jashore University of Science and Technology

Department of Physics

Bachelor of Science with Honours in Physics

1st semester of 3rd year, Academic session: 2022–2023

Course no.: PHY 3103

Course title: Quantum Mechanics I

Class test no.: 01

Date: February 03, 2024

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1. Which of the following wave functions cannot be solution of Schrödinger equation for all values of x ? [8]

(a) $\psi = A \cos x$

(e) $\psi = Ae^{-x}$

(b) $\psi = A \tan x$

(f) $\Psi = Ae^{-i(Et - xp_x)/\hbar}$

(c) $\psi = A(\cos x) \cdot (\tan x)$

(g) $\psi = Axe^{-x^2}$

(d) $\psi = A x \sin(x)$

(h) $\psi = A \ln(1 + 5x)$

2. What is the uncertainty relation between position and momentum? Explain its significance. Show that the uncertainty relation hold dimensionally. [6]

3. Write down the postulates of quantum mechanics. [6]