

# Jashore University of Science and Technology

Bachelor of Science Electrical and Electronic Engineering

1st semester of 1st year

Course no. : PHY 1101

Course title : Physics

Class test no. : 02

Date : April 05, 2023

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1. Find the energy of an x-ray photon which can impart a maximum energy of 50 keV to an electron. [6]

2. Which of the following wave functions cannot be solution of Schrödinger equation for all values of  $x$ ? [4]

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

3. A wave function has the value  $\psi(x) = A \sin x$  in the region  $0 < x < \pi$  and zero elsewhere. (a) Normalize the wave function. (b) Find the probability that the particle is between  $x = 0$  and  $x = \pi/2$ . [10]