Daffodil International University

Faculty of Science & Information Technology

Department of Software Engineering

Final Examination, Summer 2026

Course Code: PHY 101 ; Course Title: Physics-I

Sections & Teachers: A-D(SH), E-G(RH).

RIA

Time: 2 Hrs **Marks: 40**

Answer All Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a.	**Describe the following terms:** i. Nuclear fission in the Rooppur nuclear power plant ii. Photoelectric effect	5+5	CLO1, C1
2.	a.	**Explain** how attosecond LASER pulses can be used to study electron motion in a solar cell and how this knowledge may help improve its efficiency.	5	CLO2, C2
	b.	When sunlight passes through two tiny holes or gaps, we see light and dark lines on the wall. **Estimate** the intensity of the bright and dark fringes formed in Young's double-slit experiment.	5	
	c.	**Elaborate** with a supporting diagram how Brewster's angle, Malus's law, and specific rotation relate to light behavior, and compare how their applications differ from the light control mechanisms used in polaroid sunglasses.	5	
3.	a.	In an interference experiment using two narrow slits illuminated by a monochromatic light source, the separation between the centers of two consecutive bright fringes observed on a screen is found to be 0.55 mm. The screen is placed 65 cm away from the slits. The light used has a frequency of 6.2×10^{14} Hz. i. **Calculate** the separation between the slit. ii. If the slit separation is now doubled while keeping the wavelength and screen distance unchanged, **compute** the new fringe width. iii. **Determine** the position of the 4th bright fringe in both the original and the modified setup, and compare the two results. iv. **Predict** the total number of bright fringes that can be observed within a 12 mm width of the screen, centered on the central maximum.	7.5	CLO3, C3
	b.	A beam of light of wavelength 2.8×10^{-7} m is incident on a metallic plate of Zinc. The stopping potential is found to be 3.1 V. i. **Calculate** the maximum velocity of photo electron in both Joules and eV. ii. **Calculate** the value of work function and threshold frequency. iii. If the wavelength of incident light is modified to 3.2×10^{-7} m, **predict** the new stopping potential and justify whether photoemission will still occur.	7.5	