Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Final Examination, Fall 2025

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

Sections & Teachers: A-D(SH), E-H, M (MI), I-L(RH)

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:** **a.** Coherent light source and types of light interference **b.** LASER	**5+5**	**CO-1, C1**
2.	**a.**	Using the example of light from a point source (like a bulb), **elaborate** the concept of a wavefront using Huygen's principle. **Explain** how it is formed and represent it with a suitable labeled diagram.	**5**	**CO-2, 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, and **compute** how changing the distance between the slits affects the spacing between the fringes in Young's double-slit experiment.	**5**	
	c.	**Interpret** the principles of the photoelectric effect, using relevant equations and diagrams to explain its role in demonstrating the particle nature of light such as in solar panels.	**5**	
3.	**a.**	The distance between the centers of two consecutive bright fringes in Young's experiment is 0.75 mm. The distance of the screen from the slit is 68 cm. The frequency of the light is 1.2×10^{10} Hz. **Compute** **i.** The separation between the slit. **ii.** The width of dark fringes. **iii.** The distance of 5^{th} bright and dark fringes respectively from the central bright fringe.	**5**	**CO-3, C3**
	b.	A light beam of 3.2×10^{-7} m wavelength is incident on a metallic plate of Nickel. The value of stopping potential found 3.6 V. **Estimate** i. The maximum velocity of photo electron. ii. The energy of incident light in keV. iii. The value of work function and threshold frequency.	**5**	
	c.	A monochromatic light beam in air is incident on a glass surface with refractive index 1.5. The light is adjusted to strike the surface at Brewster's angle. This reflected beam then passes through a polarizer and a 20cm sample to be filled with 10% sugar solution which turned through 25^0 and incident on analyzer. **Calculate** i. The Brewster angle. ii. The intensity after the second polarizer. iii. The analyzer angle relative to the first polarizer that would give zero transmission.	**5**	