



Daffodil International University
Faculty of Science & Information Technology
Department of Computer Science and Engineering
Final Examination, Summer-2025
Course Code: PHY101, Course Title: Physics I
Level: 1 Term: 2 Batch: 68

Time: 2 Hour

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)	Recall the concept of Polarization of light.	1	CO1
	b)	State Fermat's Principle.	1	
	c)	Explain the postulates of Kinetic theory of gas.	2	
	d)	Write down difference between isothermal and adiabatic process.	2	
	e)	Tell the concept of entropy and its significance.	2	
	f)	Define critical angle and total internal reflection with diagram.	2	
2.	a)	Explain the relation between pressure and volume of a gas in adiabatic change ($PV^\gamma = \text{constant}$).	4	CO2
	b)	Demonstrate to the entropy change in reversible and irreversible process.	4	
	c)	Show the theory of interference fringes for Young's Double slit experiment.	4	
	d)	Explain with the aid of a diagram, how optical fibers are constructed and operated based principle of total internal reflection?	3	
3.	a)	In a sound interference experiment, the distance between two consecutive bright fringes is <u>12 mm</u> on a screen placed <u>250 cm</u> away. If the wavelength of the sound is <u>3.4 cm</u> , find the separation between the slits.	3	CO3
	b)	The specific rotation of a solution is 65° . When the solution was placed in a polarimeter tube 120 cm long, the observed rotation was 19° . Calculate the concentration of the solution?	3	
	c)	A sample of gas at 57°C is suddenly expanded to one-third of its original volume in an insulated cylinder. Assuming the process is adiabatic and $\gamma=1.33$, what is the final temperature of the gas?	3	
	d)	The efficiency of a Carnot refrigerator is 50% when the cold reservoir (sink) is at 17°C . What must be the change in the hot reservoir (source) temperature (in $^\circ\text{C}$) to increase the efficiency to 70%?	3	
	e)	0.5 kg of water at 70°C is converted into steam at 100°C . Find the change in entropy. The latent heat of vaporization of water is $2.26 \times 10^6 \text{ J/kg}$.	3	