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Daffodil International University

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Final Examination, Fall-2023
Course Code: PHY101, Course Title: Physics-I
Level: 1 Term: 1 Batch: 65
Time: 2:00 Hours **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)*	What is the basic difference between heat and temperature?	**[Marks]** [1x10=10]	**CO-1**
	b)	What is refractive index?		
	c)	What is the relation between phase difference and path difference?		
	d)	State 1st law of thermodynamics .		
	e)	What is diffraction of light?		
	f)	What is reflection of light?		
	g)	What is destructive interference of light?		
	h)	What are the types of thermodynamic process?		
	i)	What is entropy?		
	j)	What is root mean square velocity of gas molecule?		
2.	*a)*	Briefly explain the signal pass through of an optical fiber.	**[Marks]** [4x3+3=15]	**CO-2**
	b)	Explain Young's double slit experiment.		
	c)	Explain that the entropy change of a perfect reversible engine is zero.		
	d)	Show that the ratio of specific heat (C_p/C_v) is 1.4 for diatomic gas molecules.		
3.	*a)*	The refractive index of core glass is 1.53 and cladding glass is 1.48 of a fiber optic cable. Find the minimum angle of incident light for total internal reflection	**[Marks]** [3x5=15]	**CO-3**
	b)	A ray of light travels from water into a glass at an angle of incidence of 30 degrees. If the refractive index of the glass and water are 1.52 and 1.33, respectively. Determine the angle of refraction.		
	c)	Determine the temperature at Fahrenheit scales which has 45^0 in at Celsius scale.		
	d)	Let a gas enclosed in a cylinder with piston. By keeping the pressure fixed at 400 Pa, if 1200 J heat is supplied to the system it does 700 J work. Determine the change in internal energy of the system.		
	e)	A Carnot's engine is operated between two reservoirs at temperature of the source is 520K and 400K. If the engine receives 1000 calories of heat in each cycle, calculate the heat reject in each cycle. (1 cal= 4.18 J)		

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