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Daffodil International University

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Final Examination, Fall-2023
Course Code: PHY102, Course Title: Physics II: Basic Electricity and Magnetism and Modern Physics
Level: 1 Term: 2 Batch: 64

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)*	What was the problem in Rutherford Atomic Model?	2	CO1
	b)	State Isotope and Isotone with examples in your own words.	2	
	c)	Show the Binding Energy per nucleon curve.	1	
	d)	Define Half-life and X-ray?	2	
	e)	What can you say about nuclear fusion and chain reaction?	2	
	f)	Illustrate Capacitance.	1	
2.	*a)*	How is mass related to energy according to Einstein? Explain it.	4	CO2
	b)	How would you categorize the capacitance of a parallel plate capacitor.	4	
	c)	Discover Einstein's photo electric equation.	3	
	d)	Simplify the radio active decay law.	4	
3.	*a)*	What approach would you use to calculate the energy of 12 atomic mass unit in electron volt (eV).	3	CO3
	b)	How would you solve the problem that how long will it take to decay 60% of a piece of radon? Half-life of radon is 3.82 days.	3	
	c)	What would result if a woman at the age of 35 left in a spacecraft moving with velocity 0.98 c for trip to the space with leaving behind a daughter of 10 years old on earth. According to the counting of time she returned to the earth spending 30 years in space. After returning whose age was what among them?	3	
	d)	What facts would you select to show when a photon of wavelength 0.40 nm after collision with an electron at rest is deflected through an angle 150° with respect to the previous path. Calculate the velocity and frequency of the deflected photon.	3	
	e)	What other way would you plan to find the energy that is released if two protons and two neutrons combine to form an alpha particle? [Mass of $^{1}_{1}H$ atom is 1.007825 amu; Mass of neutron is 1.008665 amu and Mass of $^{4}_{2}He$ atom is 4.00260 amu].	3	