Daffodil International University
Faculty of Science & Information Technology
Department of Computer Science & Engineering
Mid Examination, Spring 2025
Course Code: PHY102, Course Title: Physics II
Level: 1 Term: 2 Batch: 67

Time: 01:30 Hrs.   Marks: 25

Answer ALL the 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 potential in an electric field.	1	CO1
	b)	Draw the circuit connection between a galvanometer and a shunt.	1	
	c)	Define the conductivity of conducting material.	1	
	d)	Describe the Lorentz force with its components.	1	
	e)	State Faraday's law of induction.	1	
2.	a)	Explain how Coulomb's law can be derived from Gauss's law.	3	CO2
	b)	Construct an expression for magnetic induction at a point due to a long straight wire carrying current.	3	
	c)	You found a capacitor in the physics lab that looks like a tennis ball. Discover the exact equation for the capacitance of this capacitor and hence show that it depends only on the radius of the capacitor in a fixed medium.	4	
3.	a)	The values of two-point charges are $+5C$ and $+3C$, respectively. They are situated 2 cm apart. At which point on the line joining them will the electric field intensity be zero?	2.5	CO3
	b)	What shunt resistance is to be added to a galvanometer of resistance of $20\ \Omega$ so that 10 % of total current flows through the galvanometer?	2.5	
	c)	If an electron moves at a velocity of 10^5 m/s in a uniform magnetic field of 0.5 Tesla making an angle of 60° with the field, compute the magnetic force acting on the electron.	2.5	
	d)	Two concentric circular coils have radii 8cm and 10cm, with 40 and 10 turns, respectively. A current of 5A flows through each coil in the same direction. Calculate the magnetic field *in Gauss* at the center of the coils.	2.5	