



Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Mid Semester Examination, Fall 2024

Course Code: PHY102, Course Title: Physics II

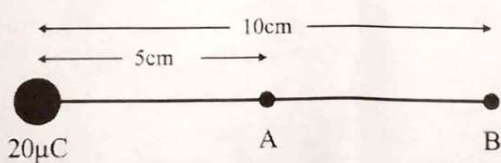
Level: 1 Term: 2 Batch: 66

Time: 01:30 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)	Define capacitance.	1	CO1
	b)	Recall electric flux.	1	
	c)	Relate current with resistance.	1	
	d)	List some examples of electromagnets.	1	
	e)	State Faraday's Law.	1	
2.	a)	Using Gauss's law, show that the electric field intensity near a straight, uniformly charged wire is given by $E = \frac{1}{2\pi\epsilon_0} \frac{\lambda}{r}$; where symbols have their usual meaning.	3	CO2
	b)	Illustrate the capacitance of a cylindrical shaped capacitor.	3	
	c)	Compute the magnetic induction at the center of a circular coil carrying current. What will be the magnetic field if current flows through 66 turns of the coil?	3+1	
3.	a)	 Identify the work done in taking an electron from point B to A.	2.5	CO3
	b)	The area of each plate of a parallel plate capacitor is $1.5 \times 10^6 \text{ mm}^2$ and the distance between the plates is 2 cm. If the potential difference is 60 V, then find the charge in each plate.	2.5	
	c)	A wire is carrying $1 \times 10^2 \text{ mA}$ current. Calculate the magnetic field at a distance 50 cm from the wire.	2.5	
	d)	The magnetic flux through a flat surface of area 5.0 cm^2 in a uniform magnetic field of 4.0 T is 1.0 mWb. What is the angle between the surface and the magnetic field?	2.5	