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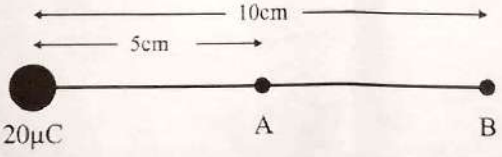
Daffodil International University

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 1.5×10^6 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 1×10^2 mA current. Calculate the magnetic field at a distance 50cm 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	