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G H Raisoni College of Engineering and Management, Pune

(An Empowered Autonomous Institute affiliated to Savitribai Phule, Pune University, NAAC Accredited "A+" Grade)

First Year B. Tech.

(TERM-I)

CAE I Winter 2025 (2023 Pattern)

Engineering Physics (23UBSL1204)

(Time: - 01 Hour) (Max. Marks:20)

Instructions to the students:

i) All questions are compulsory. ii) Neat diagrams must be drawn wherever necessary. iii) Figures to the right indicate full marks. iv) Use of scientific calculator is allowed v) Assume suitable data, if necessary.

Q.No	Question	Marks	CO	BL
Q1.(a)	Prove that the velocity acquired by an electron in uniform parallel electric field is directly proportional to the square root of the potential difference.	[5]	CO1	L3
	OR			
(b)	Apply the knowledge of CRO to measure the amplitude of an AC voltage and determine an unknown frequency using Lissajous figures.	[5]	CO1	L3
(c)	i) Compare the electron microscope and optical microscope.	[5]	CO1	L3
	ii) 2 keV electron is projected into a uniform magnetic field of induction 0.1 T with its velocity vector making an angle of 90^0 with the field. Find the radius of a circular path.			
	OR			
(d)	A proton is projected into a region of a uniform electric field of 4×10^5 N/C. The proton travels 5 cm against the field direction before it comes to rest. Determine (i) the deceleration of the proton, (ii) its initial speed and (iii) the time taken by proton to come to rest.	[5]	CO1	L3
Q 2.(a)	Explain in short how interference occurs in the reflected light from a wedge-shaped film with the help of a neat diagram. State the conditions of constructive and destructive interferences and state the nature of the interference fringes.	[5]	CO2	L2
	OR			
(b)	Obtain an expression for optical path difference between the rays reflected from uniform thin film.	[5]	CO2	L2

$\frac{mv^2}{2} = Bqe$

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(c) Discuss how an interference can be used to test the flatness of a surface. [5] CO2 L3

OR

(d) i) An anti-reflection coating of refractive index 1.38 is deposited on a glass surface(n=1.52). Find the minimum thickness of the coating required to eliminate reflection for light of wavelength 550 nm in air. [5] CO2 L3

ii) Explain the need of an antireflection coatings and how it can be used to reduce the intensity of reflected light.

- **BL – Bloom's Taxonomy Levels (1- Remember, 2- Understand, 3 – Apply, 4 – Analyze,5 –Evaluate 6 - Create)**
- **CO- Course Outcomes**