

# G H Raisoni College of Engineering and Management, Pune

(An Autonomous Institution)

F.Y B. Tech (Engineering)

FIRST Term (2020-21)

CAE-I (2020 Pattern)

## Engineering Physics (UBSL101)

[Time: 1 Hour]

[Max. Marks-15]

### COURSE OUTCOME:

Upon successful completion of this course, student will be able to:

1. Identify the trajectories of electron in uniform Electric and Magnetic fields and operate related devices.
2. Describe the phenomenon of interference & implement it for finding related parameters.
3. Explain the working of Laser & use it for different applications.
4. Identify various optoelectronic devices and use them for various applications.
5. Apply the knowledge of Quantum Mechanics to solve related problems.

### Instructions to the candidates:

1. (CO1/CO2) at the beginning of question/sub question indicates the course outcome related to the question.
2. All questions compulsory.
3. Neat diagrams must be drawn wherever necessary.
4. Figures to the right indicate full marks.
5. Assume suitable data, if necessary.

CO	Sub Questions	Marks
CO1	<p>a) State and give formula for</p> <p>(i) Coulomb force in case of electron and proton</p> <p>(ii) Lorentz force in case of charge 'q'</p> <p>b) Show that the path of electron entering in uniform electric field at right angles to the field lines and traveling through the field is parabolic.</p> <p>c) Prove that, for small value of angle, the pitch of the helix followed by an electron is independent of the angle.</p> <p>d) An electron starts from rest and moves freely in an electric field of intensity 0.24 kV/C. Determine,</p> <p>(i) force acting on electron,</p> <p>(ii) acceleration,</p> <p>(iii) kinetic energy (in eV) acquired and</p> <p>(iv) velocity attained if the electron moves through a potential difference of 0.9 kV.</p>	<p>[2]</p> <p>[3]</p> <p>[3]</p> <p>[3]</p>
<b>OR</b>		
	<p>e) An alpha (<math>\alpha</math>) particle is accelerated through a potential difference of 1000 V which then enter a magnetic field of flux density 2000 gauss perpendicular to their direction of motion.</p> <p>Calculate the radius of the circular orbit.</p> <p>(Given: <math>m_\alpha = 2m_p + 2m_n = 6.68 \times 10^{-24}</math> kg, <math>q_\alpha = 2e = 3.2 \times 10^{-19}</math> C)</p>	[3]
CO2	<p>a) State any four conditions to obtain steady interference pattern.</p> <p>b) What is destructive interference? Give the condition for constructive interference pattern.</p>	<p>[2]</p> <p>[2]</p>