GIET UNIVERSITY, GUNUPUR – 765022
M. Sc (Second Semester) Regular Examinations, July – 2023
22PHPC201– Classical Electrodynamics
(Physics)

Time: 3 hrs   Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A   **(2 x 10 = 20 Marks)**

Q.1. Answer *ALL* questions

		CO #	Blooms Level
a.	Write the Maxwell's equations in differential form.	CO1	K1
b.	What is wave guide? Explain TEM mode is not possible in a wave guide.	CO1	K1
c.	Define cut-off wavelength. Write the condition for attenuation.	CO1	K3
d.	Write the Larmor's formula.	CO2	K1
e.	What are L -W potentials?	CO2	K2
f.	What is the relation between radiation electric field (E_{rad}) and magnetic induction field (B_{rad})? Write the radial dependence of $E_{induction}$ and $E_{radiation}$.	CO2	K2
g.	Define Debye length.	CO4	K1
h.	What do you mean by scattering cross section?	CO3	K1
i.	Discuss the conditions for the occurrence of plasma.	CO4	K2
j.	Write the basic difference between Thomson Scattering and Rayleigh scattering.	CO3	K2

PART – B   **(10 x 5 = 50 Marks)**

Answer *ANY FIVE* questions

		Marks	CO #	Blooms Level
2	Discuss the propagation of electromagnetic wave guide in a rectangular wave guide in TE mode.	10	CO1	K1
3	Derive the expression for electric and magnetic field due to uniformly moving electron using field equation.	10	CO2	K2
4	Derive the expression for Lienard-Weichart Potential.	10	CO2	K1
5	Explain Rayleigh scattering on the basis of scattering of electromagnetic waves by bound electrons.	10	CO3	K2
6	Define scattering and discuss the scattering by an individual free electron.	10	CO3	K2
7	Discuss quasineutrality of plasma and hence explain Debye length.	10	CO4	K1
8	Discuss the behaviour of plasma in (i) uniform B, E = 0 and (ii) in presence of both electric and magnetic field.	10	CO4	K2

--- End of Paper ---