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Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET UNIVERSITY)

M.Sc. (Second Semester – Regular/Supplementary) Examinations, May– 2026

24MPHPC12001– CLASSICAL ELECTRODYNAMICS

Physics

Time: 3 hrs

Maximum: 60 Marks

Answer ALL questions

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

PART – A

(2 x 5 = 10 Marks)

Q.1. Answer **ALL** questions

	CO #	Blooms Level
a. What do you mean by plane electromagnetic wave?	CO1	K3
b. Difference between uniformly moving charge and accelerated charge.	CO2	K1
c. What is radiative damping?	CO3	K2
d. Earth ionosphere consists of a plasma of density around 10^{-15} Kg per m^3 . Calculate the velocity of Alfven waves in ionosphere taking magnetic field 10 micro-Tesla.	CO4	K2
e. Define four potentials.	CO4	K1

PART – B

(10 x 5 = 50 Marks)

Answer **ALL** the questions

	Marks	CO #	Blooms Level
2. a. Define plane wave. Also compare between the propagation of EM between free space and conducting medium. (OR)	10	CO1	K3
b. Derive an expression for EM wave equation for free space.	10	CO1	K2
3.a. Discuss radiation from a non-relativistic moving charge. (OR)	10	CO2	K1
c. Derive Larmor formula for power radiated by an accelerated charge.	10	CO2	K2
4.a. Explain absorption and emission by oscillator. (OR)	10	CO3	K1
c. Discuss about dispersion and its physical meaning.	10	CO3	K3
5.a. Describe plasma oscillation and derive an expression for plasma frequency. (OR)	10	CO4	K3
c. Explain magnetohydrodynamics (MHD).	10	CO4	K1
6.a. Explain Lorentz invariance of Maxwell's equations. Write any two properties of Lorentz transformation. (OR)	10	CO4	K2
c. Derive relativistic equation of motion of a charged particle.	10	CO4	K3

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