Sanjay Ghodawat University, Kolhapur

2020-21

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

EXM/P/09/00

Year and Program: PG M.Sc II	**School of Science**	**Department: Physics**
Course Code: PHS515R1	**Course Title: Introduction to Electrodynamics**	**Semester : I**
Day :	**End Semester Examination**	**Time : 2 Hrs.**
Date :		**Max Marks : 50**

Question Paper

Instructions: 1) All Questions are compulsory.
2) Use of non-programmable calculator is allowed.

		Marks	BL	CO
Q.1	**Answer the following (any Two)–**			
a)	Write Maxwell's equation for electromagnetic fields and modify them for a dielectric material.	8	L2	CO1
b)	i) Express the law of conservation of charge and derive it.	4	L3	CO1
	ii) Explain how this law leads to the modification of Maxwell's 4th equation?	4		
c)	Show that the retarded potentials satisfy the inhomogeneous wave equations.	8	L3	CO2
Q.2	**Answer the following (any two) –**			
a)	Obtain Lienard-Wiechert potential.	8	L2	CO2
b)	What is Bremsstrahlung? Write angular distribution of power radiated by point charge for collinear velocity and acceleration.	8	L2	CO3
c)	Illustrate the radiation emitted by a point charge at high velocity	8	L3	CO3
Q.3	**Answer the following (any two) –**			
a)	Using field tensor i.e. dual tensor $G^{\mu\nu}$, derive Maxwell's equations.	9	L3	CO4
b)	Find out the scalar product of velocity four and momentum four	9	L2	CO4

with itself.

c)	Which theorem depicts the law of conservation of energy? Derive the law for a charge moving in an electromagnetic field.	9	L2	CO1

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