Reg. No.: .....

Name: .....

University of Kerala

W7191

Third Semester FYUGP Degree Examination, November 2025

Discipline Specific Elective

PHYSICS

UK3DSEPHY207 - Electrodynamics

Academic Level: 200-299

2024 Admission

Time: 1 Hour 30 Minutes(90 Mins.) **Max. Marks: 42**

Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark Each.Answer all questions

Qn No.	Question	CL	CO
1	State Gauss's law in differential form.	RE	1
2	List any two properties of dielectric material	RE	2
3	Identify one example each of a polar molecule and a non-polar molecule.	UN	2
4	Describe how electric and magnetic fields together influence the motion of a charged particle.	UN	3
5	Write any two Maxwell's equations.	UN	4
6	Interpret the meaning of divergence of magnetic field in Maxwell's equation.	UN	4

Part B.8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Derive the relation between potential and electric field.	UN	1
8	Describe how the components of the electric field behave at the interface between two dielectric media.	UN	2
9	Apply Lenz's law to find the direction of the induced current when the magnetic flux through a coil increases.	AP	4
10	Relate the equation of continuity in magnetostatics.	AP	3

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO
11	A) Apply Maxwell's equations in vacuum to the formulation of electromagnetic wave equations for electric and magnetic fields. OR B) Calculate the expression for energy propagated by electromagnetic waves.	AP	4, 4
12	A) Analyse the concept of electric displacement and derive Gauss's law in a dielectric medium. OR B) Classify polar and non polar molecules. Compare the alignment of polar molecules in uniform and non uniform electric field.	AN	2, 2
13	A) Explain the physical interpretation of curl of (∇xB) and determine an expression for magnetic field produced due to a solenoid. OR B) Evaluate the concept of magnetic flux and its physical interpretation.	EV	3, 3
14	A) Design and develop a theoretical model using Gauss's law to determine the electric field distribution for a uniformly charged solid sphere; (a) a point inside, and (b) a point outside the sphere. OR B) Construct an expressions and propose a graphical representation showing how the potential varies inside and outside the sphere, taking infinity as the reference point.	CR	1, 1