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Reg. No. | | | | | | | | |

I Semester M.Sc. Degree Examination, March/April - 2025

PHYSICS

Classical Electrodynamics

(CBCS New Scheme 2020-21)

Paper : PHY-103

Time : 3 Hours **Maximum Marks :70**

Instructions to Candidates:

Answer All the questions.

1. a) Explain Gauss's law and its applications.

   b) Obtain Laplace's equations in one, two and three dimensional Cartesian coordinates. **(5+10)**

(OR)

2. a) Explain Biot-Savart law and its applications.

   b) Derive an expression for Multipole expansion of the Vector potential. **(5+10)**

3. a) Explain Coulomb and Lorentz Gauges.

   b) Express Maxwell's equations in terms of scalar and vector potentials. **(5+10)**

(OR)

4. a) State and explain Poynting's thereom.

   b) Obtain an expression for reflection and transmission of electromagnetic waves. **(5+10)**

5. a) Explain the Lienard-Wiechert potentials.

   b) Obtain an expression for electric and magnetic dipole radiation. **(5+10)**

(OR)

6. a) Explain the relativistic phenomena of magnetism.

   b) Discuss the potential formulation of electrodynamics. **(7+8)**

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(5×5=25)

7. Answer any Five of the following questions.

a) Explain the method of images and its applications.

b) State and explain Uniqueness theorem.

c) Obtain an expression for energy and momentum of electromagnetic waves.

d) Explain the behaviour of plane waves in conducting media.

e) Obtain Larmor formula in electromagnetic radiation.

f) Write a note on electromagnetic field tensors.