Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name: Electrodynamics and plasma physics

Subject Code: 5SC02PHC1 Branch: M.Sc.(Physics)

Semester: 2 Date: 04/05/2016 Time: 10:30 To 1:30 Marks: 70

Instructions:

(1) Use of Programmable calculator and any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

SECTION – I

Q-1 Attempt the Following questions (07)

a. What is the advantage of the coulomb gauge? **01**
b. Give Ampere's law with correction. **01**
c. Give the equation of speed of electromagnetic waves. **01**
d. Define plane of incidence. **01**
e. What is Gauge freedom? **01**
f. Define Retarded Potential. **02**

Q-2 Attempt all questions (14)

a) Explain Maxwell's equations with correction. **06**
b) Compare Coulomb Gauge and Lorentz Gauge. **05**
c) Derive Maxwell's equation for magnetic charge. **03**

OR

Q-2 Attempt all questions (14)

a) Explain in details Gauge Transformation. **06**
b) What is Retarded Potential? Explain. **05**
c) Describe Scalar and Vector Potentials. **03**

Q-3 Attempt all questions (14)

a) Explain in details Maxwell's equation in matter. **07**
b) Explain Reflection and transmission at Normal incidence. **07**

OR

Q-3 Attempt all questions (14)

a) Explain in details Field of a moving point charge. **07**
b) Explain Boundary condition in details. **07**

SECTION – II

Q-4 **Attempt the Following questions** **(07)**

a. What is plasma? **02**
b. Give criteria for plasma. **02**
c. Define Plasma instabilities. **02**
d. What is convective derivative? **01**

Q-5 **Attempt all questions** **(14)**

a) Discuss Fluid drift perpendicular to B. **05**
b) Compare whistler and Faraday rotation. **06**
c) Explain plasma parameters. **03**

OR

Q-5 **Attempt all questions** **(14)**

a) Explain Fluid equation of Plasma. **05**
b) Compare Phase velocity and Group velocity of Plasma. **06**
c) Compute λ_D and N_D for a gas discharge with n=$10^{16}m^{-3}$ and KTe =2ev. **03**

Q-6 **Attempt all questions** **(14)**

a) Explain Plasma instabilities with its types **07**
b) Explain applications of Plasma. **07**

OR

Q-6 **Attempt all Questions** **(14)**

a) Explain Plasma oscillations. **07**
b) Compare Magneto sonic and Alfven waves. **07**