Exam Seat No:_____ Enrollment No:_____

C.U.SHAH UNIVERSITY

Wadhwan City

Subject Code : 5SC02PHC1 **Summer Examination-2014** **Date: 9/06/2014**

Subject Name Electrodynamics and plasma physics

Branch/Semester:- M.Sc(Physics) /II **Time:02:00 To 5:00**

Examination: Regular

Instructions:-

(1) Attempt all Questions of both sections in same answer book / Supplementary
(2) Use of Programmable calculator & any other electronic instrument is prohibited.
(3) Instructions written on main answer Book are strictly to be obeyed.
(4) Draw neat diagrams & figures (If necessary) at right places
(5) Assume suitable & Perfect data if needed

SECTION-I

Q-1 Do as Directed.(All Questions are compulsory) **(07)**

a) Define Retarded potential. (02)
b) Give the definition of Scalar and vector potential. (02)
c) Give the four dimensional Poisson's equation. (01)
d) Define monochromatic waves. (01)
e) Give the definition of gauge transformation. (01)

Q-2 Answer the following in detail.

a) Explain Retarded potential in details. (06)
b) Explain Boundary condition. (06)
c) Define Lorentz Gauge. (02)

OR

Q-2 Answer the following in detail.

a) Explain Lienard –Wiechert Potential in details. (07)
b) Explain Maxwell's equation with correction. (05)
c) Define Coulomb Gauge. (02)

Q-3 Answer the following in detail.

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

OR

Q-3 Answer the following in detail.

a) Explain Reflection and transmission at oblique incidence. (07)
b) Explain the field of a moving point charge using Lienard –Wiechert Potential (07)

SECTION-II

Q-4 Do as Directed.(All Questions are compulsory) (07)

a) Give Plasma parameters. (02)
b) Give Maghnad saha's equation for Natural plasma state not produced on earth. (02)
c) Gives criteria for Plasma. (02)
d) Define plasma. (01)

Q-5 Answer the following in detail.

a) Give application of plasma. (06)

b) Explain Fluid equation of plasma. (04)

c) Compute λ_D and N_D for the earth's ionosphere with n=$10^{12}m^{-3}$ and KTe =0.1 ev. (04)

OR

Q-5 Answer the following in detail.

a) Explain Quasineutrality and collective behavior of plasma. (05)

b) Explain plasma oscillations. (05)

c) Explain convective derivative. (04)

Q-6 Answer the following in detail.

a) Explain magneto sonic and Alfven waves. (07)

b) Explain Fluid drift perpendicular to B. (07)

OR

Q-6 Answer the following in detail.

a) Explain Debye shielding and derive Debye length for plasma. (07)

b) Explain concept of tress Tensor for plasma. (07)

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