Enrollment No:-_____   Exam Seat No:-_____

C.U.SHAH UNIVERSITY
Summer-2015

Subject Code: 5SC02PHC1 **Subject Name: Electrodynamics and Plasma Physics**
Course Name: M.Sc. (Physics)   Date: 18/5/2015
Semester:II   Marks:70
                                                 Time:10:30 TO 01:30
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Instructions:
1) Attempt all Questions in same answer book/Supplementary.
2) Use of Programmable calculator & any other electronic instrument 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.
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Section – I

Q-1   Do as Directed.(All Questions are compulsory)   (07)
 a)   Give the definition of Scalar and Vector potential.   (02)
 b)   Give the four dimensional Poisson's equation.   (02)
 c)   Define Retarded Potential.   (02)
 d)   Give the equation of Ampere's law with correction form.   (01)

Q-2   Answer the following.
 a)   Discuss in brief Boundary condition.   (06)
 b)   Explain Maxwell's equation with correction.   (06)
 c)   Define Lorentz Gauge.   (02)

                                   OR
Q-2   Answer the following.
 a)   Explain Retarded potential in details.   (06)
 b)   Explain Gauge Transformation in details.   (06)
 c)   Gives the properties of electromagnetic waves.   (02)

Q-3   Answer the following .
 a)   Explain Reflection and transmission at oblique incidence   (07)
 b)   Discuss Maxwell's equation in matter.   (07)

                                   OR
Q-3   Answer the following .
 a)   Explain Reflection and transmission at Normal incidence.   (07)
 b)   Explain in detail Lienard -Wiechert Potential.   (07)

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Q-4   Do as Directed.(All Questions are compulsory)   (07)
  a)   What is plasma?   (02)
  b)   Give Fluid equation of Plasma.   (01)
  c)   Define Plasma Parameters.   (02)
  d)   Give the criterion for plasma confinement.   (02)

Q-5   Answer the following.
  a)   Give application of plasma.   (05)
  b)   Explain Magneto sonic and Alfven waves.   (05)
  c)   Explain group velocity of plasma.   (04)

OR

Q-5   Answer the following .
  a)   Explain Fluid equation of plasma.   (05)
  b)   Explain Quasineutrality and collective behavior of plasma.   (05)
  c)   Explain Phase velocity of Plasma.   (04)

Q-6   Answer the following .
  a)   Discuss in details Plasma instabilities.   (07)
  b)   Explain Fluid drift perpendicular to B.   (07)

OR

Q-6   Answer the following.
  a)   Discuss Debye shielding in details and obtain expression for Debye length of plasma.   (07)
  b)   Discuss Plasma Oscillations.   (07)

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