

(4)

6. (a) Explain in detail the effect of radiation damping on the monochromatic nature of radiations emitted by a harmonic oscillator. 16

Or

(b) Explain Rayleigh scattering the basis of scattering of electromagnetic wave by bound electrons.

Total Pages—4

M.Sc.—Phy-IIS (201)

2017

Time : 3 hours

Full Marks : 80

Answer from both the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(CLASSICAL ELECTRODYNAMICS)

SECTION—A

1. Answer any *four* questions : 4 × 4
- (a) Explain electric dipole and multiple radiations.
 - (b) What are Lienard-Wiechert potentials? Explain.
 - (c) Explain the concept of virtual photon.
 - (d) Write a note on Bremsstrahlung radiation.
 - (e) Obtain dispersion relation.

(2)

(f) Explain the absorption of radiation by an oscillator.

Or

2. Answer all questions : 2 × 8

- (a) Define radiation field.
- (b) What is multipole radiation ?
- (c) What are retarded potentials ?
- (d) What do you mean by convection potential ?
- (e) Define scattering cross-section.
- (f) What is dispersion ? Explan.
- (g) What is radiation damping ?
- (h) What is Thomson scattering ?

SECTION—B

Answer all questions : 16 × 4

3. (a) Obtain the solution of wave equations for potentials by Fourier Analysis. 16

(3)

Or

(b) What is Hertz potential ? Obtain the expressions for radiation fields by Hertz method. 16

4. (a) Derive expressions for Lienard-Wiechert potentials and fields for a moving point charge. 16

Or

(b) What is wave guide ? Explain the propagation of electromagnetic waves in rectangular wave guides. 16

5. (a) Obtain the expressions for fields of an accelerated charge radiation at low velocities parallel to acceleration. 16

Or

(b) Obtain the expression for classical cross-section for bremsstrahlung in a coulomb field and explain Cherenkov radiation.