Or

(b) Write notes on :

   (i) Scattering by free electron

   (ii) Electric dipole radiation.

6. (a) Derive the expressions for electric and magnetic field produce due to accelerated charge particle at low velocity.

Or

(b) Discuss the equilibrium between an oscillator and a radiation field. Derive the necessary mathematical derivation.

————

2018

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) What do you mean by multipole radiation ?

   (b) Explain the Lienard-Wiechart potential for a relativistic charge particle.

   (c) What is Bremsstrahlung ? Explain.

   (d) What do you mean by Rayleigh-Scattering ?

(2)

(e) State Maxwell's field equations for electro-magnetic waves and reduce in terms of electromagnetic potentials.

(f) Write notes on Fourier analysis.

Or

2. Answer *all* questions :   2 × 8

(a) What is the physical significance of dispersion relation ?

(b) What is Cherenkov radiation ?

(c) Define electromagnetic potentials ?

(d) What is wave guide ?

(e) Define radiation energy.

(f) Explain concept of virtual photon.

(g) What is difference in Thomson and Raman Scattering ?

(h) How X-ray are produced ?

(3)

SECTION – B

Answer **all** questions :   16 × 4

3. (a) Using the multipole expension often the spherical components of electric field.

Or

(b) Derive the expressions of the Lienard -Wiechart potentials and fields for a point charge.

4. (a) Derive and expression for computing radiation fields using Hertz method.

Or

(b) Derive the expressions for electric and magnetic field due to uniformly moving electron using field equations.

5. (a) Discuss the propagation of electromagnetic waves in regtangular waves guide. Hence derive the necessary dispersion relation.