Exam. Code : 103206

Subject Code : 1343

B.A./B.Sc. 6th Semester

PHYSICS

Paper—B (Radiation and Particle Physics)

Time Allowed—3 Hours] [Maximum Marks—35

Note :— (1) All parts of question **1** in Section A are compulsory.

(2) Attempt **one** question from each of the Sections—B, C, D and E. All questions carry equal marks.

SECTION—A

1. (a) What is the important difference between X-rays and Gamma rays ?

(b) What are Bremsstrahlung radiations ?

(c) Compton shift is independent of the nature of the scatter. Justify.

(d) What is the difference between dead time and recovery time of Geiger Mueller (GM) detector ?

(e) What are Cherenkov radiations ?

(f) Can electrons be accelerated by using cyclotron ? Explain briefly.

(g) What are fermions and bosons ? 7×1=7

SECTION—B

2 Derive an expression for Range of charged particle. Why is Bloch-Bethe relation not valid for electrons ? 7

3. Derive a relation between angle of scattering photon and that of recoiling electron for Compton scattering process. 7

SECTION—C

4. Explain the principle, construction and working of Geiger Mueller (GM). Give its advantages and limitations. 7

5. Discuss the working of Solid State Nuclear Track Detectors (SSNTD) and explain the importance of etching time. 7

SECTION—D

6. Discuss the principle, construction and working of Betatron. 7

7. Derive an expression for the maximum kinetic energy achieved by a charged particle of mass 'm' in terms of applied magnetic field and dee radius for Cyclotron. Explain briefly how can you accelerate electrons. 7

SECTION—E

8. Explain Gell Mann-Nishijima scheme to classification of elementary particles. 7

9. What are strange particles ? Explain the concept of strangeness and principle of associated production. 7