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

(ELEMENTARY PARTICLE PHYSICS)

SECTION – A

1. Answer any *four* of the following :   4 × 4

    (a) Explain Baryon number with examples.

    (b) Write a note on strangeness quantum number.

    (c) Give conservation laws in relation to decays.

    (d) Explain parity in quantum mechanics.

    (e) Explain time reversal.

    (f) Explain the concept of I-spin.

(2)

Or

2. Answer *all* questions : 2 × 8

(a) What are Leptons ?

(b) Define color quantum number.

(c) What are nuclear forces ?

(d) Define decay.

(e) What is Time reversal ?

(f) Define charge conjugation.

(g) Define SU(3) symmetry.

(h) Give concept of V-spin.

SECTION – B

Answer all questions : 16 × 4

3. (a) Explain the classification of Leptons and Quarks and their interactions.

Or

(b) Distinguish between color quantum number and strangeness quantum numbers and explain their interactions.

(3)

4. (a) Explain the charge independence of nuclear forces and discuss the test for isospin conservation.

Or

(b) Obtain Gell-Mann Nishijima scheme and explain the conservation laws in relation to particle reactions.

5. (a) Explain in detail the Parity and Time reversal in field theories.

Or

(b) State and explain CPT theorem and its consequences.

6. (a) Give the concept of U-spin and discuss Quark model of the nucleus.

Or

(b) Give the Mesons and Baryons in the octet representation and explain Baryon-Meson coupling.

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