

Nuclear and Particle physics (Paper - 401)

Expected Questions for End Semester Exam - 2020

- ① Long answer type Questions
- ① Electric Quadrupole moment
- ② Ground state of deuteron
- ③ n-p scattering at low energies / Partial wave analysis of n-p scattering at low energies.
- ④ Effective range theory of n-p scattering
- ⑤ Meson theory of nuclear forces
- ⑥ coherent n-p scattering and spin dependence of nuclear force.
- ⑦ Liquid drop model and Bohr's theory of nuclear fission.
- ⑧ Shell model and its success and limitations.
- ⑨ Semi empirical mass formula
- ⑩ Resonance in nuclear reactions - Breit - Wigner dispersion formula for $l=0$ neutrons.
- ⑪ Fermi's theory of β -decay.
- ⑫ Classification of fundamental forces and elementary particles
- ⑬ Strangeness - Gell-Mann and Nishijima formula
- ⑭ Quark model

Short answer type Questions and notes

- ① Concept of B/A nucleus and binding energy.
- ② electric and magnetic moment.
- ③ Parity and statistics of nucleus.
- ④ Nuclear forces and its characteristics.
- ⑤ conclusions from n-p and p-p scattering at low energy.
- ⑥ Exchange forces and tensor forces (notes)
- ⑦ charge independence and charge symmetry of nuclear forces (notes)

Q - value and threshold energy

- (9) Compound nucleus theory (notes)
- (10) electromagnetic interactions with nuclei
- (11) two component theory of neutron decay.
- (12) Yukawa interaction.
- (13) Symmetries and Conservation laws.

(14) Isospin

~~(15)~~ C.P.T invariance
