1594/MPC

MAY 2008

Paper VII — ATOMIC AND NUCLEAR PHYSICS

Time : Three hours Maximum : 100 marks

Answer ALL questions.

$(5 \times 20 = 100)$

1. (a) Deduce Lane quations. Explain Reciprocal lattice based on these equations. Explain Brillouin Zone.

Or

(b) Describe the configuration of diatomic molecules with examples. What are conjugate molecules? Explain.

2. (a) Explain the predictions of shell model. How the discrepancies caused in shell model is overcome in collective model.

Or

(b) Discuss the meson theory of nuclear forces. Write a note on nuclear isomerism.

3. (a) State the fundamental laws of Radio activity. Obtain expression for half-life and average period. Describe the Wu's experiment to prove the parity violation.

Or

(b) Discuss in detail the Fermi theory of beta decay. Explain the neutrino hypothesis.

4. (a) State and explain Reciprocity theorem. Derive Breit-Wigher dispersion formula.

Or

(b) Explain the types of nuclear fission. Discuss Bhor and Wheeler's theory of nuclear fission.

5. (a) Discuss the conservations laws obeyed by elementary particles. What are Leptons and Mesons? Explain.

Or

(b) Explain the ideas of eight fold symmetry of elementary particles on the basis of SU_3 group. Explain the quark concept.
