LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION –PHYSICS

FIFTH SEMESTER – APRIL 2018

PH 5507 / PH 5504 / PH 5500 – ATOMIC & NUCLEAR PHYSICS

Date: 27-04-2018   Dept. No.   Max. : 100 Marks
Time: 09:00-12:00

PART A (10X 2 = 20)

Answer ALL   questions

1. State Pauli's exclusion principle.
2. What is Stark effect?
3. Define mass defect and packing fraction.
4. State Geiger- Nuttal law.
5. What are slow neutrons?
6. Define nuclear fission.
7. What are cosmic rays?
8. Write the Quark content and strangeness of Proton and neutron.
9. Define chemical shift.
10. What is Larmor precession?

PART B (4 x7. 5 = 30)

Answer any FOUR question

11. Explain in detail, anomalous Zeeman Effect.
12. Explain line and continuous   spectrum of beta decay.
13. Discuss liquid drop model of a nucleus.
14. Explain cosmic ray showers, Pair production and Annihilation of matter.
15. Describe the principle of nuclear magnetic resonance.
16. Describe Rabi's method of determining nuclear magnetic moment

PART C 4 x 12.5 = 50)

Answer any FOUR questions

17. Describe Thomson's parabola method for positive ray analysis.
18. Discuss in detail the Stern-Gerlach experiment
19. Describe the construction and working of a nuclear reactor.
20. Discuss elementary particle quantum numbers and the associated conservation laws.
21. Explain Mossbauer spectroscopy.
22. Outline the tunneling phenomena to explain α decay.

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