



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – PHYSICS

SIXTH SEMESTER – APRIL 2022

UPH 6502 – ATOMIC AND NUCLEAR PHYSICS

Date: 17-06-2022

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

Part – A

(10 x 2 = 20 Marks)

Answer ALL Questions

1. Define Pauli exclusion principle.
2. What is meant by fine structure of spectral lines?
3. State Paschen Back effect.
4. Mention the characteristics of Raman lines.
5. Write a short note on packing fraction.
6. What are isotopes? Give an example.
7. Define Bohr magneton.
8. Explain nuclear fusion.
9. List out the four forces in nature.
10. Distinguish between bosons and fermions.

Part - B

(4 x 7.5 = 30 Marks)

Answer any FOUR Questions

11. Discuss vector atom model and the quantum numbers associated with it.
12. With neat diagrams explain LS and JJ coupling schemes.
13. Explain the formation of sodium D lines.
14. Draw a plot of binding energy of a nucleus versus mass number.
Using it explain the stability of nucleus.
15. Discuss the principle and working of atom bomb.
16. Write a note on classification of elementary classification.

Part – C

(4 X 12.5 = 50 Marks)

Answer any FOUR Questions

17. Describe Millikan's oil drop method to determine the electronic charge.
18. Discuss anomalous Zeeman effect using sodium D lines as an example.
19. Write a detailed account of successive disintegration of radioactive substance.
20. Using semi-empirical mass formula, obtain an expression for the binding energy of a nucleus.
21. What is the principle used in nuclear reactor? Explain the working of nuclear reactor and mention its advantages.
22. Explain the different conservation laws in elementary particle physics.

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