



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – CHEMISTRY

SECOND SEMESTER – NOVEMBER 2016

CH 2820 - MAIN GROUP ELEMENTS & NUCLEAR CHEMISTRY

Date: 08-11-2016
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

Part-A

Answer ALL questions.

(10 × 2= 20)

1. What are cryptands? Cite an example.
2. How is hydroboration reaction used in the synthesis of borane clusters?
3. What is molybdenum blue? Mention any one application.
4. Why is OF_2 called as fluoride whereas ClO_2 is called as oxide?
5. What are the different types of bonding in diborane?
6. Why are electrons not found inside the nucleus?
7. What is nuclear isomerism? Give an example.
8. How is a hydrogen bomb different from an atom bomb?
9. Briefly give the principle of a breeder reactor.
10. What is the role of a moderator in a conventional nuclear fission reactor?

Part-B

Answer any EIGHT questions.

(8 × 5= 40)

11. Write a brief note on the types of hydrides and highlight their unique properties with suitable examples.
12. What are boranes? How are they classified?
13. Discuss the structure of XeF_4 and XeOF_2 using VSEPR theory.
14. Explain with chemical equation that Cl_2O and ClO_2 act as good oxidizing agent.
15. Discuss the types of fluorinating agent with suitable examples.
16. Write a brief note on fullerene.
17. Write a note on the range of α , β^- and γ particles.
18. Explain the working of a scintillation counter.
19. Discuss the mechanism of production of energy in sun and stars.
20. Mention the qualities of a good coolant in a nuclear reactor.
21. What are sequestering agents? What is their application in radiochemistry?
22. Explain electron capture and its consequences.

Part-C

Answer any FOUR questions.

(4 × 10= 40)

23. How does functioning of Na^+/K^+ pump action relate with the transmission of nerve impulse?
24. Why is borazine considered as inorganic benzene? Justify.
- 25 a. Discuss the classification of silicates.
b. Explain why zeolite is considered as molecular sieve.
26. Discuss the various factors affecting stability of a nucleus.
27. How are the spent fuels from a nuclear reactor reprocessed?
28. Explain any one use of nuclear chemistry as an analytical tool.
