



Date: 29-04-2016

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

PART- A

Answer **ALL** questions

(10 x 2 = 20 marks)

1. “Fe, Co and Ni are ferromagnetic.” Justify.
2. Mention any two biological importance of iron.
3. “Actinide ions are coloured.” Why?
4. How does Uranium react with (i) Oxygen (ii) Steam?
5. Define co-ordination number.
6. Name the following complexes
(i) $[\text{Co}(\text{NO}_2)_3(\text{NH}_3)_3]$
(ii) $(\text{NH}_4)_2[\text{Cr}(\text{NCS})_6]$.
7. State Geiger – Nuttal rule.
8. What is binding energy?
9. What is the principle involved in hydrogen bomb?
10. What do you mean by spallation reaction?

PART- B

Answer any **EIGHT** questions

(8 x 5 = 40 marks)

11. Discuss the various oxidation states exhibited by titanium.
12. Explain the synthesis and reactivity of tungsten bronzes
13. Discuss M-M bonding found in chlorides of transition elements.
14. State and explain lanthanide contraction.
15. Enumerate the extraction of lanthanides by solvent extraction and ion exchange processes.
16. Discuss the factors influencing the magnitude of Crystal field splitting.
17. (i) Define EAN. (2marks)
(ii) Calculate EAN of the following complexes (3marks)
a. $[\text{Fe}(\text{CN})_6]^{4-}$ b. $[\text{Co}(\text{NH}_3)_6]^{3+}$ c. $\text{Ni}(\text{CO})_4$.
18. What are the limitations of valence bond theory?
19. Explain the liquid drop model of nucleus.
20. (i) Define n/p ratio. (2marks)
(ii) Discuss the stability of nucleus using n/p ratio. (3marks)
21. Write notes on breeder reactor.
22. Describe nuclear chain reaction.

PART- C

Answer any **FOUR** questions

(4x10 = 40 marks)

23. (i) What are the ores of titanium? (2marks)
(ii) Explain the extraction of titanium from its ore. (8marks)
24. Give a brief account on the ores, extraction and uses of uranium.
25. Enumerate the evidences in favour of covalent bonding in Metal-Ligand bonding.
26. (i) Discuss the optical isomerism exhibited by complexes with co-ordination number 6. (5marks)
(ii) Explain the structure of following complexes on the basis of crystal field theory. (5marks)
a. $[\text{Co F}_6]^{3-}$ b. $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$.
27. Describe the measurement of radioactivity using
(i) Geiger counter (5marks)
(ii) Scintillation counter (5marks)
28. Write notes on any five applications of radio isotopes.

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