K24P 0268

Reg. No. : .....

Name : .....

IV Semester M.Sc. Degree (C.B.S.S. – Reg./Supple. – (One Time Mercy Chance)/Imp.) Examination, April 2024
(2014 Admission Onwards)
CHEMISTRY
CHE4C.11 : Inorganic Chemistry – III

Time : 3 Hours Max. Marks : 60

SECTION – A

(Answer **all** questions in **one** word or **one** sentence. **Each** carries **one** mark.)

1. Why Eu and Yb exhibit +2 oxidation state ?
2. Define half wave potential in polarography.
3. What is the structure of iron pentacarbonyl ?
4. What is the necessary condition for a molecule to be IR active ?
5. What are essential elements ?
6. Which are the detectors used in UV-Visible spectroscopy ?
7. Arrange the following in the increasing order of their magnetic moment. 1) Eu^{3+}, 2) Gd^{3+}, 3) Tb^{3+} , 4) Dy^{3+}.
8. If the absorbance value of K_2CrO_4 solution is 0.762, calculate the percentage of radiation absorbed by it. **(8×1=8)**

SECTION – B

(Answer **any 8** questions. Answer may be **two** or **three** sentences. **Each** question carries **2** marks.)

9. State and explain EAN rule. Give an example for a metal carbonyl that doesn't obey EAN rule.
10. What is meant by a zinc finger ? What are its functions ?

P.T.O.

11. What are chemical interferences in AAS ?

12. Compare the relative tendencies of lanthanides and actinides to form complexes.

13. Explain Frost diagram.

14. Mention a method for the preparation of metal carbonylate anions.

15. Myoglobin gets saturated with oxygen at a faster rate than haemoglobin. Why ?

16. Write an account of Pt based anticancer drugs.

17. Mention any 2 properties of plutonium.

18. Explain the application of EPR spectroscopy in inorganic Chemistry.

19. "NO^+ is a three-electron donor while NO^- is one-electron donor". Justify.

20. What is meant by a reference electrode in potentiometry ? Give 2 examples. **(8×2=16)**

SECTION – C

(Short paragraph questions. Answer **any 4** questions. **Each** carries **3** marks.)

21. Write a note on Latimer diagram.

22. Comment on the non complementary nature of TG and DTA.

23. Write a note on Trans actinide elements.

24. Write a note on calcium signaling proteins.

25. Explain chelation therapy with an example.

26. Briefly discuss about metal cyano complexes.

27 Discuss the chemical properties of +2 oxidation state of lanthanides.

28. Explain the principle of neutron diffraction method. **(4×3=12)**

SECTION – D

(Essay type – Answer **4** questions. **Each** carries **6** marks.)

29. A) What is lanthanide contraction ? Briefly discuss the causes and consequences of lanthanide contraction.

OR

B) Explain the different steps involved in the isolation of lanthanides from monazite sand.

30. A) Write a note on metal phosphine complexes.

OR

B) Discuss the preparation, properties and structures of iron carbonyls.

31. A) Discuss briefly about the use of iron proteins as sensors.

OR

B) Discuss the nitrogen cycle.

32. A) Explain the principle of EPR spectroscopy and its applications in inorganic Chemistry.

OR

B) Discuss the principle, instrumentation and applications of atomic absorption spectroscopy. **(4×6=24)**

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