E 2922 (Pages : 2) Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, APRIL 2022

Fifth Semester

Core Course—CHEMISTRY OF D AND F BLOCK ELEMENTS

(B.Sc. Chemistry Model I and Model II, B.Sc. Petrochemicals B.Sc. Chemistry Environment and Water Management)

(2013–2016 Admissions)

Time : Three Hours Maximum Marks : 60

Part A

Answer **all** *questions.*

Each question carries 1 *mark.*

1. Write the General electronic configuration of *f*-block elements.
2. Give an example of structural isomerism exhibited by co-ordination compounds.
3. What is the IVPAC name of the complex $[Co\ Cl_2\ (en)_2]^+$?
4. What is meant by chilate effect?
5. What are organometallic compounds?
6. What is ambidentate ligand? Give an example. Give two biological functions of Fe.
7. What is the function of cytochrome – C?
8. Name a metalloenzyme of zinc.

$(8 \times 1 = 8)$

Part B

Answer any **six** *questions.*

Each question carries 2 *marks.*

9. Calculate the 'spin only' magnetic moment of M^{2+} (aq) ion $(z = 27)$.
10. Give reason "transition metals and many of their compounds act as good catalysts".
11. Why are low spin tetrahedral complexes not formal?
12. $[Fe\ (H_2O)_6]^{3+}$ is strongly paramagnetic whereas is $[Fe\ (CN)_6]^{3-}$ weekly paramagnetic. Explain.
13. When an co-ordination compound $Cocl_3.6NH_3$ is mixed with $AyNO_3$, 3 moles of AgCl are precipitated per mole of the compound. Write ((i) the structural formula of the complex ; (ii) IVPAC name of the complex.

Turn over

14. Illustrate 18 electron rule.
15. How does spectral studies help in the determination of bond order in CO Bond?
16. Explain the biological function and toxicity of Cu.
17. What are anticancer drugs? Give example.
18. What is Bohr effect?

(6 × 2 = 12)

Part C

Answer any **four** *questions.*
Each question carries 4 marks.

19. How is the stability of a coordination compound in solution decided? How is the dissociation constant of a complex defined?
20. Explain crystal field splitting in octahedral field.
21. Explain John-Teller distortion in Cu (11) complexes.
22. Explain the structure of [Ni $(CO)_4$].
23. What is meant by poisoning of enzymes?
24. Discuss the role of blood as an oxygen carrier.

(4 × 4 = 16)

Part D

Answer any **two** *questions.*
Each question carries 12 marks.

25. (a) Explain Lanthanide contraction. What are the consequences of Lanthanide contraction?
    (b) Compounds of transition metals are generally coloured. Give reason. Explain.
26. Explain ligand substitution reaction in square planar complex.
27. (a) Explain Zeigler-Natta polymerization.
    (b) Explain the structure of ferrocene. How it is prepared?
28. Discuss the structure of $Re_2Cl_8o^{2-}$ on the basis of MOT.

(2 × 12 = 24)