

M.Sc. Part – I
Sem - II
Paper II Inorganic Chemistry
Sample Questions

1.number that represents the total number of electrons surrounding the nucleus of a metal atom in a metal complex.
 - A. 18 Electron rule
 - B. 16 Electron Rule
 - C. Effective atomic rule
 - D. Neutral count rule
2. Ferrocene is a metallocene compound with stable..... configuration.
 - A. Cis- Trans configuration
 - B. Trans configuration
 - C. Staggered configuration
 - D. Eclipsed configuration
3. In carbonyl Compound in which C & O are hybridized.
 - A. SP
 - B. SP²
 - C. SP³
 - D. dSP²
4. What is hapticity of s EDTA?
 - A. 3
 - B. 4
 - C. 5
 - D. 6
5. Ferrocene is compound with 10 electrons.
 - A. Aromatic
 - B. Anti-aromatic
 - C. Non aromatic
6. Zeise salt is first alkene metal complex in which Pt is in oxidation number.
 - A. +1
 - B. +2
 - C. -2
 - D. -1
7. According to IR spectroscopy and electron diffraction method di-benzene chromium is geometry
 - A. Octahedral
 - B. Tetrahedral
 - C. Square Planar
 - D. Antiprismatic
8. Di-benzene chromium is aromatic compound with hybridization.
 - A. dSP³
 - B. d²SP²
 - C d³SP³
 - D. SP³d³

9. Which of the following is an example of..... Half sandwiched compound.
- $\text{Co}(\text{NH}_3)_5\text{Cl}$
 - $\text{C}_5\text{H}_5\text{Co}(\text{CO})_2$
 - $(\text{C}_5\text{H}_5)_2\text{Fe}$
 - $(\text{C}_6\text{H}_6)_2\text{Co}$
10. In Dibenzene chromium complex Cr is in oxidation state
- +1
 - +2
 - +3
 - +4
11. The changes (from A-D given below) which occur when O_2 binds to hemerythrin are
- One iron atoms is oxidized
 - Both the iron atoms are oxidized
 - O_2 binds to one iron atom and is also hydrogen bonded.
 - O_2 binds to both the iron atoms and is also hydrogen bonded.
- B and C
 - B and D
 - A and D
 - A and C
12. The oxidation state of iron in met-hemoglobin is
- Three
 - Two
 - Four
 - Zero
13. Which of following is a channel forming ionophore-----?
- Valinomycin
 - Salinomycin
 - Gramicidin
 - All.
14. The metal present in both superoxide dismutase & hemocyanin is -----
- Zn
 - Fe
 - Cu
 - Ni
15. The metal ion present in urease is -----
- Ni
 - Cu
 - Co
 - Mn
16. The ionophore valinomycin is highly selective for ----
- K^+
 - Na^+
 - Mg^{2+}
 - Ca^{2+}
17. Hemerythrin belongs to the group of---
- Non heme iron transport
 - Heme iron Protein
 - Binuclear copper protein
 - non heme none iron protein

18. The metal present in nitrogenase are-----?

- a)Fe & Mg
- b)Mo & K
- c)Mo & Fe
- d)Fe & K

19. In biological system, the metal ion involved in dioxygen transport besides Fe is-----

- a)Co
- b)Zn
- c)Mg
- d)Cu

20. Role of ferritin protein in biological process---

- a)Metal ion storage
- b)Transport of oxygen
- c)Storage of oxygen
- d)All the three

21. Which is complimentary reaction.

- A. $\text{Co}^{3+} + \text{Cr}^{2+} \rightleftharpoons \text{Co}^{2+} + \text{Cr}^{3+}$
- B. $\text{Ti}^{3+} + 2\text{Fe}^{2+} \rightleftharpoons \text{Ti}^{4+} + 2\text{Fe}^{3+}$
- C. $2\text{Co}^{3+} + \text{Ti}^{+} \rightleftharpoons 2\text{Co}^{2+} + \text{Ti}^{3+}$
- D. $\text{Sn}^{2+} + \text{Fe}^{3+} \rightleftharpoons \text{Sn}^{4+} + \text{Fe}^{2+}$

22. Which is non complimentary reaction.

- A. $\text{Sn}^{2+} + \text{Ti}^{3+} \rightleftharpoons \text{Sn}^{4+} + \text{Ti}^{+}$
- B. $\text{Sn}^{2+} + \text{Hg}^{2+} \rightleftharpoons \text{Sn}^{4+} + \text{Hg}$
- C. $\text{Co}^{3+} + \text{Cr}^{2+} \rightleftharpoons \text{Co}^{2+} + \text{Cr}^{3+}$
- D. $\text{Ti}^{3+} + 2\text{Fe}^{2+} \rightleftharpoons \text{Ti}^{4+} + 2\text{Fe}^{3+}$

23. Which is non complimentary reaction

- A. $2\text{Co}^{3+} + \text{Ti}^{+} \rightleftharpoons 2\text{Co}^{2+} + \text{Ti}^{3+}$
- B. $\text{Sn}^{2+} + \text{Ti}^{3+} \rightleftharpoons \text{Sn}^{4+} + \text{Ti}^{+}$
- C. $\text{Sn}^{2+} + \text{Hg}^{2+} \rightleftharpoons \text{Sn}^{4+} + \text{Hg}$
- D. $\text{Co}^{3+} + \text{Cr}^{2+} \rightleftharpoons \text{Co}^{2+} + \text{Cr}^{3+}$

24. According to Marcus theory ΔG for reaction is -----

- A.Slow
- B.Fast
- C.Moderate
- D.Very fast

25. Rate of reaction will be fast when -----
- A. Leaving ligands are weak
 - B. Bond between ligand and central metal ion is weak
 - C. Both a & b
 - D. Leaving ligands are strong
26. In polarization theory to induce dipole in all 4 ligands Pt(II) have charge -----
- A. Positive
 - B. Negative
 - C. Neutral
 - D. Both b & c
27. Trans effect is -----
- A. Sigma Bonding theory
 - B. π (pi) Bonding theory
 - C. δ (delta) Bonding theory
 - D. Both b & c
28. π bonding ligands accept a pair of electrons from which d orbitals of metal.
- A. dxz
 - B. dyz
 - C. Both a&b
 - D. dx^2-y^2
29. The formation of π bond in the complex ----- electron density.
- A. Increases
 - B. Decreases
 - C. Remains constant
 - D. Both b & c
30. complimentary reaction in which oxidants and reactants have ----- number of electrons.
- A. Same
 - B. Different
 - C. Both a and b
 - D. Not relevant

31. Non-complementary reaction in which oxidants and reactants have ----- number of electrons.

- A. Same
- B. Different
- C. Both a and b
- D. Not relevant

32. In inner sphere mechanism the Cr^{2+} is -----

- A. Low spin and inert
- B. High spin and labile
- C. High spin and inert
- D. Low spin and labile

33. How many electrons are in 3d orbital of Co in $[\text{Co}(\text{NH}_3)_5 \text{Cl}]^{2+}$

- A. d^6
- B. d^5
- C. d^4
- D. d^3

34. The transfer of electron from one atom to another are called

- A. Redox reaction
- B. Acid-base reaction
- C. Complex formation
- D. Solvolysis

35. PCBs are widely used in -----.

- A. Industries
- B. Aeroplanes
- C. Electrical equipment's
- D. Building materials

36. According to the Central Pollution Control Board, the diameter of particles that are responsible for causing great harm to human health is: -----

- A. 2.5 micrometer
- B. 5.0 micrometer
- C. 10.0 micrometer
- D. 7.5 micrometer

37. The expanded form of DDT is: -----

- A. dichloro diphenyl trichloroethane
- B. dichloro diethyl trichloroethane
- C. dichloro dipyrpydyl trichloroethane
- D. dichloro diphenyl tetrachloroacetate

38. Bhopal gas tragedy is associated with which of the following?

- A. CO_2
- B. Methyl Isocyanate
- C. CFC
- D. Methyl Cyanate

39. Toxicity of which of the following heavy metal leads to liver cirrhosis?

- A. Zinc
- B. Copper
- C. Lead
- D. Mercury

40. Out of the following element which is not toxic elements present in water.
- A. Mercury
 - B. Arsenic
 - C. Cadmium
 - D. Sodium
41. Which chemicals are used in the treatment from Lead poisoning?
- A. BAL
 - B. DMSA
 - C. Penicillin
 - D. both a & b
42. The element which is generally absorbed by plants along with zinc and causes Ouch Ouch disease in human being is-----
- A. Mercury
 - B. Arsenic
 - C. Cadmium
 - D. Sodium
43. Itai-itai disease was the name given to the mass of cadmium poisoning in Japan, starting around in -----.
- A. 1912
 - B. 1912
 - C. 1913
 - D. 1914
44. Heavy metals have been defined as “naturally occurring metals having atomic number greater than 20 and an elemental density greater than -----.
- A. $2 \text{ g}\cdot\text{cm}^{-3}$
 - B. $3 \text{ g}\cdot\text{cm}^{-3}$
 - C. $4 \text{ g}\cdot\text{cm}^{-3}$
 - D. $5 \text{ g}\cdot\text{cm}^{-3}$
45. Mercury has 3 forms: (1) elemental mercury, (2) inorganic salts, and (3) organic compounds. Perhaps the most deadly form of mercury is -----
- A. methyl mercury
 - B. ethyl mercury
 - C. propyl mercury
 - D. butyl mercury
46. Chromium(III), is an essential trace mineral in the human diet, so in some nutritional supplements, chromium(III) present as chromium is bound to -----.
- A. Adipic acid
 - B. Picolinic acid
 - C. Acetic acid
 - D. Lactic acid
47. X rays cause radiation damage primarily by their property of -----.
- A. penetration
 - B. radioactivity
 - C. electromagnetic induction
 - D. ionization

48. Which of the following is most sensitive to radiation induced cancer?
- A. Skin
 - B. Thyroid
 - C. Nerve
 - D. Female breast
49. The best method to reduce the radiation carries is application of viscuss-----.
- A. 0.5% neutral sodium fluoride gel
 - B. 1.0% neutral sodium fluoride gel
 - C. 0.5% neutral stannous fluoride gel
 - D. 1.0% neutral stannous fluoride gel
50. Why are the fast dividing cells more easily radiation targeted?
- A. Due to the high protein and carbohydrate content of the cells
 - B. Due to the higher energy of the cells
 - C. Due to the low energy of the cells
 - D. Due to the high oxygen content of the cells
51. When radiation therapy is done to reduce the effect of cancer, it is called as-----.
- A. Mutative Treatment
 - B. Reduction Treatment
 - C. Palliative Treatment
 - D. Genesis Treatment