2023/06

SET A

B.Sc. CHEMISTRY
FOURTH SEMESTER
INORGANIC CHEMISTRY III
BSC – 401 [REPEAT]
[USE OMR FOR OBJECTIVE PART]

Duration: 3 hrs. Full Marks: 70

(Objective)

Time: 30 min. Marks: 20

Choose the correct answer from the following: ***1X20=20***

1. According to Werner's theory of coordination compounds
   a. Primary valency is ionisable
   b. Secondary valency is ionisable
   c. Both a and b
   d. None of the above

2. Which of the following ligand will not show chelation?
   a. EDTA
   b. DMG
   c. Ethylene-1,2-diammine
   d. SCN^-

3. Correct formulae of tetraamminechloronitroplatinum (IV) sulphate can be written as
   a. $[Pt(NH_3)_3(NO_2)SO_4]Cl$
   b. $[Pt(NH_3)_4Cl(NO_2)](SO_4)_2$
   c. $[Pt(NH_3)_4Cl(NO_2)]SO_4$
   d. None of the above

4. What will be the electronic configuration of d^5 in terms of t_{2g} and e_g in an octahedral field when $\Delta o < P$, where P is the energy required for pairing of electrons in a single orbital?
   a. t_{2g}^5, e_g^0
   b. t_{2g}^2, e_g^3
   c. t_{2g}^3, e_g^2
   d. t_{2g}^0, e_g^5

5. Assign the following complexes as inert or labile: $[Mn(H_2O)_6]^{2+}$, $[Co(CN)_6]^{3-}$, $[Co(CN)_6]^{4-}$
   a. $[Mn(H_2O)_6]^{2+}$and $[Co(CN)_6]^{3-}$ are labile, $[Co(CN)_6]^{4-}$ is inert
   b. $[Mn(H_2O)_6]^{2+}$and $[Co(CN)_6]^{4-}$ are labile, $[Co(CN)_6]^{3-}$ is inert
   c. $[Co(CN)_6]^{4-}$and $[Co(CN)_6]^{3-}$ are labile, $[Mn(H_2O)_6]^{2+}$ is inert
   d. $[Mn(H_2O)_6]^{2+}$and $[Co(CN)_6]^{4-}$ are inert, $[Co(CN)_6]^{3-}$ is labile

6. Zinc is a 3d element but not considered to be a true transition element because it has
   a. Totally vacant d-orbitals
   b. Half filled d-orbitals
   c. Totally filled d-orbitals
   d. None of the above

7. Lanthanum is a
   a. s-block element
   b. d-block element
   c. p-block element
   d. f-block element.

8. The effective magnetic moment of a d-block element with 3 unpaired electrons is
   a. 1.73 BM
   b. 4.90 BM
   c. 3.87 BM
   d. None of the4 above.

9. A ferromagnetic substance is one in which alignments of magnetic moments are in the
   a. Opposite directions
   b. Same direction
   c. No direction
   d. None of the above.

10. Transition metals exhibit catalytic properties because they possess
   a. Variable valence and large surface area
   b. Are all metals
   c. High electrical conductivity
   d. None of the above.

11. Low oxidation states of metals like -1, 0, +1 are stabilized by
   a. CO
   b. O^{2-}
   c. F^-
   d. None of the above.

12. The sizes of the third transition elements (after lanthanum) are almost the same as the elements lying just above in the second transition series due to
   a. d-block contraction
   b. Lanthanide contraction
   c. Actinide contraction
   d. None of the above.

13. Hydroxyl amine decomposes to ammonia and nitrogen because in the Frost-Ebsworth Diagram the points for hydroxyl amine lies
   a. Below the line connecting the points for ammonia and nitrogen
   b. Above the line connecting points for ammonia and nitrogen
   c. Lies in the same level as ammonia and nitrogen.
   d. None of the above.

14. Anhydrous cobalt(II) salts absorb in the red region, therefore, appear
   a. blue
   b. Red
   c. yellow
   d. None of the above.

15. The synergetic mechanism involves
   a. A sigma-donation and pi-back donation
   b. Pi-donation and sigma-back donation
   c. Both a & b
   d. None of the above.

16. Which of the following statement is correct
   a. As(III) is more poisonous than As(V)
   b. As(V) is more poisonous than As(III)
   c. Enzymes are activated when As (III) binds with SH groups of enzymes.
   d. All of the above

17. Choose the wrong statement
   a. Mercury is a cumulative poison for mammals
   b. Methyl mercury and other organomercury compounds are polar in nature
   c. The mercury of waste products is converted into methyl mercury
   d. None of the above