

Chemistry
Sample Question Paper
Class XII

Class:12
Time 3hrs

Max Mks:70
No of pages:6

General Instructions:

- All questions are compulsory.
- Questions 1 to 5 are one mark questions.
- Questions 6 to 10 are two marks questions.
- Questions 11 to 22 are three marks questions.
- Question 23 is four marks question.
- Question 24 to 26 are five marks questions.
- There is no overall choice in the question paper, but internal choice is there.
- Use of calculator is not permitted.

1. Give IUPAC name of $CH_3 - CH = C(CH_3) - CH(Br) - CH_3$.
2. The decomposition reaction of ammonia gas on platinum surface has a rate constant $k = 2.5 \times 10^{-4} \text{ mol L}^{-1}\text{s}^{-1}$. What is the order of the reaction?
3. Why a tetrahedral complex of the type $[MA_2B_2]$ does not show geometrical isomerism?
4. What type of linkage holds together the monomers of D.N.A?
5. What is the Van't Hoff factor for a compound which undergoes tetramerization in organic solvents?
6. Write the mechanism of 2-bromobutane, an optically active compound reacting with aqueous KOH to form a racemic mixture of products.
7. What are 12 – 16 and 13 – 15 compounds? Give examples.

8. Write all the ionic reaction equation that occurs during rusting of iron. Suggest one method of controlling rusting of iron.
9. Rate constant K for first order reaction has been found to be $2.54 \times 10^{-5} \text{ sec}^{-1}$. Calculate its three-fourth life.
10. Do the following conversions:
- (a) Methyl bromide to acetone.
- (b) Benzyl chloride to 2-phenyl acetic acid.
11. How ethers are produced from alcohol? Explain the mechanism involved in the above reaction.
12. a) Low level nor-adrenaline is the cause of depression. What type of drugs is needed to cure this problem? Give two examples.
- b) What are fillers and builders in soaps?
13. What is semiconductor? Describe the two main types of semiconductors and explain mechanism for their conduction?
14. How will you distinguish between the following pairs of compounds:
- (a) Chloroform and carbon tetra-chloride.
- (b) Benzyl alcohol and chlorobenzene.
15. If dinitrogen gas is bubbled through water at 293K, how many millimoles of the gas would dissolve in 1 litre of water? The nitrogen gas is at 0.978 atm. Pressure at that temperature. Its Henry's law constant is $7.648 \times 10^4 \text{ atm}$.
16. Find the Gibbs energy change of the following cell reaction at 298K.
- $\text{Cr}|\text{Cr}^{3+}(0.1\text{M})||\text{Cu}^{2+}(0.01\text{M})|\text{Cu}$.

Given $E^{\circ}_{\text{Cr}^{3+}|\text{Cr}} = -0.75 \text{ V}$ and $E^{\circ}_{\text{Cu}^{2+}|\text{Cu}} = +0.34 \text{ V}$

17. Chelate therapy is growing interest in treating the problems caused by the presence of metals in toxic proportions in plant and animal systems. The detection of cations through coloured complex formation is done.
- Name the compound that stops the growth of tumours.
 - What is the alternative medicine for severe kidney damage other than Cis-platin?
 - Give the chelating agents that can remove copper, iron and lead from water.
18. a) Write down the equations for hydrolysis of XeF_4 and XeF_6 .
- Which of the above reactions is a Redox reaction? Give reasons.
19. a) What happens when hydrogen sulphuric gas is passed through acidified potassium permanganate solution?
- What is the effect of increasing pH of $\text{Cr}_2\text{O}_7^{2-}$ solution? Write chemical reaction equations.
20. Distinguish between with appropriate tests of:
- Propanoyl chloride and propanoic acid.
 - Acetophenone and benzophenone.
 - Phenol and benzoic acid.
 - Benzoic acid and ethyl benzoate.
21. (a) Which cleaning agent will you prefer in order to wash clothes with water containing dissolved calcium hydrogen carbonate, soaps or synthetic detergents? Why?
- Give an advantage of soaps over synthetic detergents.

OR

(a) What are anti-fertility drugs? Give two examples.

(b) Why ranitidine better antacids than sodium bicarbonate or magnesium hydroxide?

22. What are antihistamines? Give two examples. Explain how they act on the human body.

23. In class XII, chemistry teacher was discussing with students about vitamins. She was telling that humans, monkeys and guinea pigs do not have the enzymes necessary for the biosynthesis of vitamin C and so they must include this vitamin in their diet. A student asked few questions to her, try to answer it.

a) Name the functional group present in vitamin C.

b) Is it acidic or basic in nature?

c) Give the common name of vitamin C.

d) Name the product formed on its oxidation.

e) Give the structure of vitamin C.

24. (a) A blackish brown coloured solid 'A' when fused with alkali metal hydroxides in presence of air, produces a dark green coloured compound 'B' which on electrolytic oxidation in alkaline medium gives a dark purple coloured compound C. identify A, B, and C and write the reaction involved.

(b) What happens when an acidic solution of the green compound (B) is allowed to stand for some time? Give the equation involved. What is this type of reaction called?

OR

Give reasons for the following:

a) Transition metals have enthalpies of atomization.

b) Among the lanthanoids, Ce(III) is easily oxidized to Ce(IV).

- c) $\text{Fe}^{3+}|\text{Fe}^{2+}$ redox couple has positive electrode potential than $\text{Mn}^{3+}|\text{Mn}^{2+}$ couple.
- d) Cu (I) has d^{10} configuration while Cu (II) has d^9 configuration, still Cu (II) is more stable in aqueous solution than copper (I).
- e) The second and third transition series elements have almost similar atomic radii.
25. A translucent white waxy solid (A) on heating in an inert atmosphere is converted to its allotropic form (B). Allotrope (A) on reaction with very dilute aqueous KOH liberates a highly poisonous gas (C) having rotten fish smell. With excess of chlorine forms (D) which hydrolyses to compound (E). Identify compounds (A) to (E) .

OR

Explain the following properties of transition elements:

- a) Enthalpy of atomization.
- b) Variable oxidation state.
- c) Coloured complex formation.
26. a) Out of Ag_2SO_4 , CuF_2 , MgF_2 and CuCl , which compound will be coloured? Give reason.
- b) Explain:
- CrO_4^{2-} is a strong oxidizing agent while MnO_4^{2-} is not.
 - Zr and Hf have identical sizes.
 - The lowest oxidation state of manganese is basic while the highest is acidic.
 - Mn(II) shows maximum paramagnetic character amongst the divalent ions of the first transition series.

OR

a) In the titration of FeSO_4 with KMnO_4 in the acidic medium, why is dil. H_2SO_4 used instead of dil. HCl ?

b) Give reasons:

- Vanadium pentoxide is a good catalyst.
- Ce^{4+} is used as an oxidizing agent in volumetric analysis.
- Transition metals form a number of interstitial compounds.
- Zn^{2+} salts are white while Cu^{2+} salts are blue.