

BHARATIYA VIDYA BHAVAN'S V.M.PUBLIC SCHOOL, VADODARA  
SESSION 2017-18  
Sample paper-1

Class: XII  
Subject: Chemistry

Max Marks: 70  
Time Allotted: 3 hrs

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General Instructions:

1. All questions are compulsory.
2. Marks for each question are indicated against it.
3. Q.No. 1 to 5 are very short questions and carry one mark each.
4. Q.No.6 to 10 are short answer questions of 2 marks each.
5. Q.No.11 to 22 are also short answer questions and carry 3 marks each.
6. Q.No. 23 is value based question and carries 4 marks.
7. Q.No. 24 to 26 are long answer questions and carry 5 marks each.
8. Use log tables if necessary .Use of calculators is not permitted.

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1. Name one solid which has both Schottky and Frenkel defect.
  2. Draw the structure of DDT
  3. Why o- hydroxybenzaldehyde is a liquid at room temperature? While p- hydroxybenzaldehyde is a high melting solid.
  4. Give the IUPAC name of the following compound:
  5. How will you obtain gluconic acid and n-hexane from glucose?
  6. Distinguish between the following pairs:
    - i. 1-phenyl ethanol and 2- phenyl ethanol
    - ii. Aniline and ethyl amine
  7. Give a brief account of corrosion & its mechanics.
  8. A 1<sup>st</sup> order reaction with respect to reactant A has rate constant  $6 \text{ min}^{-1}$ . If we start with  $[A] = 5.0 \text{ mol L}^{-1}$  when would  $[A]$  reach the value of  $0.5 \text{ mol L}^{-1}$ ?
  9. Draw the structure of phosphinic acid ( $\text{H}_3\text{PO}_2$ ) and write its chemical reaction for its use as a reducing agent.

OR

Draw the structure of phosphoric acid ( $\text{H}_3\text{PO}_3$ ) and why it is diprotic in nature?

10. Give the structures of A & B
  - a)
  - b)
11. Define the following with one example
  - a) Sulpha drugs
  - b) Antibiotics
  - c) Antiseptics
12. Write one method of preparation and one use of the following
  - a) Polythene
  - b) PAN
  - c) Teflon
13. a) What do you mean by
  - i) Peptide Linkage
  - ii) Glycosidic Linkage
  - b) Name one water soluble vitamin, its source & disease caused by its deficiency.
14. Write balanced equation for the following:
  - i) NaCl is heated with  $\text{H}_2\text{SO}_4$  in the presence of  $\text{MnO}_2$ .

- ii)  $\text{Cl}_2$  (g) is passed into a solution of  $\text{NaI}$  in water.
- iii)  $\text{PCl}_5$  reacts with heavy water.

OR

14. How is ammonia manufactured industrially? Draw flow chart for the manufacture of ammonia. Give any two uses.

15. A hydrocarbon 'A' ( $\text{C}_4\text{H}_8$ ) on reaction with  $\text{HCl}$  gives a compound 'B' ( $\text{C}_4\text{H}_9\text{Cl}$ ) which on reaction with 1 mole of  $\text{NH}_3$  gives compound 'C' ( $\text{C}_4\text{H}_{11}\text{N}$ ). Identify compound A to C.

16. Give a short note on the following:

- a) Dow's process
- b) Wurtz-Fittig reaction

17. Explain the following:

- i) Nickel does not form low spin octahedral complexes.
- ii)  $\text{CO}^{+2}$  is easily oxidised to  $\text{CO}^{+3}$  in the presence of a strong ligand.
- iii)  $\text{CO}$  is a stronger ligand than  $\text{NH}_3$  for many metals.

18. Give reason:

- i)  $\text{NO}$  is paramagnetic in the gaseous state but diamagnetic in the liquid and solid states.

Why?

- ii)  $\text{SF}_6$  is much less relative than  $\text{SF}_4$ .
- iii) Xenon does not form Fluorides such as  $\text{XeF}_3$  &  $\text{XeF}_5$ .

19. a) Write down the chemical reactions taking place in different zones in the blast furnace during extraction of iron.

20. The data given below is for the reaction  $2\text{N}_2\text{O}_5(\text{g}) \rightarrow 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$  at 298k.

S. No.	$[\text{N}_2\text{O}_5] \text{ mol L}^{-1}$	Rate of disappearance of $\text{N}_2\text{O}_5$ ( $\text{mol L}^{-1} \text{min}^{-1}$ )
1	0.0113	$34 \times 10^{-5}$
2	0.0084	$25 \times 10^{-5}$
3	0.0062	$18 \times 10^{-5}$

Determine for this reaction:

Order of reaction

Rate constant

Rate law

21. Resistance of conductivity cell filled with 0.1 M  $\text{KCl}$  solution is 100 ohm. If the resistance of the same cell when filled with 0.02M  $\text{KCl}$  solution is 520 ohm. Calculate the conductivity and molar conductivity of 0.02M  $\text{KCl}$  solution. Conductivity of 0.1M  $\text{KCl}$  solution is  $1.29 \text{ Sm}^{-1}$ .

22. The density of aluminium is  $2700 \text{ kg/m}^3$ . Aluminium crystallizes in face-centred cubic lattice. Calculate the radius of aluminium atom in metres. (At. Mass of  $\text{Al} = 27$ ).

23. You have quite often seen smoke coming out of chimney in industrial areas. Smoke cause pollution and therefore, no industry is allowed to let the smoke directly go into the atmosphere. It has to be treated suitably to remove carbon particles. Now answer the following questions:

What we should not do in our homes which cause pollution in the atmosphere?

What basic principle is involved in removing carbon particles from smoke?

24. a) Give Reasons:

i) When methyl alcohol is added to water, boiling point of water increases.

ii) When NaCl is added to water, a depression in freezing point is observed.

b) A 0.1539 molal aqueous solution of cane sugar (M.M. 342g/mole) has a freezing point of 271K while the freezing point of pure water is 273.15K. What will be the freezing point of an aqueous solution containing 5g of glucose (M.M. = 180g/mole) per 100g solution.

OR

What is meant by positive and negative deviations from Raoult's law and how is the sign of  $\Delta H_{sol}$  related to positive and negative deviation from Raoult's law.

The vapour pressure of a 5% aqueous solution of a non volatile organic substance at 373K is 745mm. Calculate the molar mass of the solute.

25) How would you account for the following?

A) i) Of the  $d^4$  species,  $Cr^{+2}$  is strongly reducing while  $Mn^{+3}$  is strongly oxidizing.

ii)  $Co(III)$  is stable in aqueous solution but in the presence of complexing reagents, it is easily oxidised.

B) Describe the preparation of  $K_2Cr_2O_7$  from chromite ( $FeCr_2O_4$ ) ore. Write the chemical equations involved in it. What is the effect of increasing pH of a solution of  $K_2Cr_2O_7$ .

OR

A) How would you account for the following?

i) Many of the transition elements and their compounds can act as good catalysts.

ii) The metallic radii of  $d$  (third) series of transition elements are virtually the same as those of the corresponding members of the second series.

B) Describe how  $KMnO_4$  is made from pyrolusite. Write the chemical equations for the reactions involved. What happens when?

i) Acidified solution of  $KMnO_4$  is heated with oxalic acid.

ii)  $K_2Cr_2O_7$  is heated with NaCl and concentrated  $H_2SO_4$ .

26. How will you bring out the following conversions?

i) Propanone to propene

ii) Benzoic acid to Benzaldehyde

iii) Bromobenzene to 1-phenyl ethanol

iv) Ethanol to 3-hydroxy butanal

v) Benzaldehyde to Benzophenone

OR

26. A) Give explanation for the following:

i) Cyclohexanone forms cyanohydrin in good yield but 2, 2, 6 trimethyl cyclohexanone does not.

ii) There are two  $-NH_2$  groups in semicarbazide but only one takes part in formation of semicarbazone.

iii) During the preparation of esters from a carboxylic acid and an alcohol in the presence of an acid catalyst, the water or the ester formed should be removed as soon as it is formed.

B) An organic compound (A) (molecular formula  $C_4H_8O_2$ ) was hydrolysed with dilute  $H_2SO_4$  to give a carboxylic acid (B) and an alcohol (C). On oxidation of (C) with chromic acid produced (B). Write possible of A, B, & C. Give their IUPAC names & write chemical equations involved in the process.