CBSE Board
Class XII Chemistry
Sample Paper- 4

Time : 3 Hrs Total Marks: 70

(a) All questions are compulsory.
(b) Marks for each question are indicated against it. Question 26 is a value based question carrying four marks.
(c) Question nos. 9 to 18 are short answer questions and carry 2 marks each. Use of calculator is not permitted.
(d) Question nos. 19 to 27 are also short answer questions and carry 3 marks each
(e) Question nos. 28 to 30 are long answer questions and carry 5 marks each
(f) Use log tables if necessary, use of calculators is not allowed.

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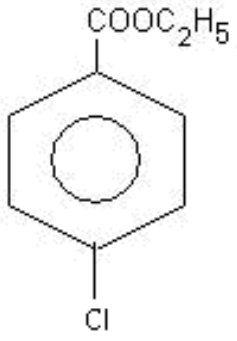
1. Colloidal particles show a zig -zag motion. What is the name given to this motion?

2. Give IUPAC name of.
a)



b)

$Cl—CH_2-CH_2-COOH$

3. Give the IUPAC name of $[Co(NH_3)_6]Cl_3$.

4. 2, 4, 6 –Trinitrophenol is soluble in aqueous Na_2CO_3 while phenol is not. Why?

5. What are elastomers? How are they different from fibres?

6. To which class of antimicrobials do the following belong: Chloroxylenol, Phenol (0.2%)

7. Aliphatic amines have a lower pK_b value than NH_3. Why?

8. What are anomers? Give an example.

9. Account for the following.

a) Si doped with P acts as a semi conductor.

b) Glass objects over a period of time start appearing milky.

10. State Henry's law. Give any one of its application.

11. Give reasons:

(a) Zn has lowest enthalpy of atomization amongst first transition series.

(b) Transition elements form coloured compounds.

OR

Give reasons:

a) Transition elements exhibit variable oxidation states.

b) Cu^+ is not stable in aqueous solution.

12. Calculate the emf of the following cell at 298K :

$$Fe(s)|Fe^{2+}(0.001M)||H^+(1M)|H_2(1\,atm)|Pt(s)$$

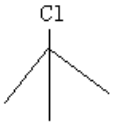
$$E^{\theta}_{Fe^{2+}|Fe} = -0.44\,V$$

13. $[Co(NH_3)_6]^{3+}$ is diamagnetic while $[CoF_6]^{3-}$ is paramagnetic. Why?
(Atomic Number of Co =27)

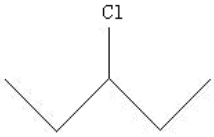
14. Name the crystal system of the compound with unit cell dimensions $\alpha=\beta= 90°$, $\gamma= 120°$ and a= 0.387, b = 0.387 and c = 0.504 nm.
Give an example of a compound in which this type of crystal system is present.

15. Which of the following undergoes S_N1 faster and why?

(a)



(b)



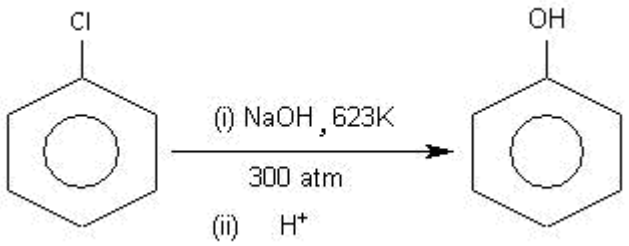
16. Give the names and structures of monomers of:

a) Dacron **b)** Buna – N

17. What is saccharin? What is the purpose of using it?

18. **a)** Name the reaction represented by following equations?

(i)



(ii)

$$CH_3CH_2-CH_2-Cl + NaI \xrightarrow{\text{acetone}} CH_3CH_2CH_2I + NaCl$$

b) Which of these has a higher boiling point and why?

Iodobenzene or Chlorobenzene.

19. Calculate the degree of dissociation of a decimolar solution of NaCl with osmotic pressure of 4.6 atm at 300K.

20. **a)** Corrosion is an electrochemical process.

b) Give equation involved in recharging a lead storage battery.

21. What happens when:

(a) A freshly prepared $Fe(OH)_3$ is shaken with a little amount of dilute solution of $FeCl_3$.

(b) Light is passed through a colloidal solution.

(c) Electric current is passed through a colloid.

22.

(a) An alloy A finds application in making bullets, shells etc. Name the alloy and give its composition.

(b) Which of the two is more basic: $La(OH)_3$ or $Lu(OH)_3$,and why?

(c) c) Why does Zr (Z= 40) and Hf (Z = 72) have similar atomic radii?

23. Account for the following:

(a) Alcohols act as weak acids.

(b) Phenols have smaller dipole moment than alcohols.

(c) How can ethers be distinguished from alcohols? Give the equation involved.

24. Rakesh and Kamal were in discussing about the acidic strength of halogen acid. Rakesh said that HCl is stronger acid so it should be used for etching of glass in making of thermometers, burettes etc, but Kamal said that HF should be used. Whom do you favour and why? Give the value which emerges from your answer.

25. Write short notes on:

a. Gabriel phthalimide synthesis

b. Hoffmann bromamide degradation method

26.

(a) What happens with D -Glucose is made to react with Br_2 water. Give equation also.

(b) Why are carbohydrates generally optically active?

(c) Why can't vitamin C be stored in the body?

OR

(a) Structurally differentiate between insulin and myosin.

(b) Two strands of DNA are complementary to each other. Account for it.

(c) Why is sucrose known as invert sugar?

27. Account for the following:

(a) Zn is not extracted from ZnO through reduction using CO.

(b) Copper matte is put in silica lined converter

(c) Graphite is used in electrometallurgy of Al.

28.

(a) Convert:

(i) Ethanal to Crotonaldehyde

(ii) Propanoic acid to Lactic acid

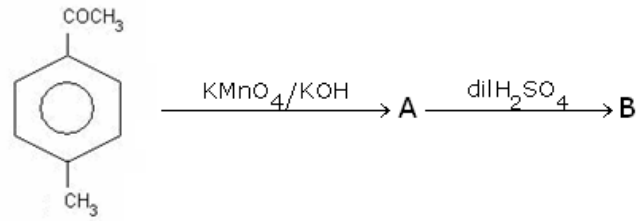
(b) Draw structure of methyl hemiacetal of formaldehyde.

(c) How do carbonyl compounds react with sodium hydrogen sulphite. Explain giving reaction.

OR

Complete the equations:

(a)



(b)

$$CH_3(CH_2)_2\ CH_2OH \xrightarrow{\text{acidified } KMnO_4} X \xrightarrow[\Delta]{P_2O_5} Y$$

(c)

$$CH_3COCH_3 \xrightarrow{NH_2.NH_2} C \xrightarrow[\Delta]{KOH/\text{ethylene glycol}} D$$

(d)

$$CH_3CH_2CN \xrightarrow[H_3O+]{C_6H_5MgBr} E$$

(e)

$$CH_3C\equiv CH + H_2O \xrightarrow{Hg^{2+},\ H^+} F$$

29. Explain:

a) Perchloric acid is a stronger acid than sulphuric acid.

b) Noble gases are bigger in size than halogens of respective period.

c) Solid PCl_5 exhibits some ionic character.

d) Oxygen has lower electron gain enthalpy than S.

e) Gaseous N_2 is used in food packaging.

OR

a) What is aqua regia? Where is it used?

b) Draw the shape of XeO_3. What is the hybridization of Xe in XeO_3?

c) Can PCl_5 act as both oxidizing and reducing agent? Give reason to support your answer.

30.

(a) The decomposition of N_2O_5, $2N_2O_5\ g \rightleftharpoons 4NO_2\ g + O_2\ g$ is a first order reaction. After 30 min from start of decomposition in closed vessel, total pressure developed is found to be 284.5 mm Hg. And on complete decomposition, total pressure is 584.5 mm Hg. Calculate rate constant of the reaction.

(b) Rate of a particular reaction quadruples when temperature changes from 293 K to 313 K. Calculate activation energy for the reaction.

OR

(a) ^{90}Sr has half life of 28. 1 years. If 1 μg of ^{90}Sr was absorbed in bones of a new born baby, how much of it will remain after 20 years, if not lost metabolically?

(b) For a reaction, $2A + B \rightarrow A_2B$, rate constant is $0.5\,mol^{-1}Ls^{-1}$

Rate Law is Rate = $k[A]^2$, Calculate the rate when :

(i) $[A] = 0.60\,mol\ L^{-1}$, $[B] = 0.05\,mol\ L^{-1}$

(ii) Concentration of A and B are reduced to $\frac{1}{4}$.