

ASN Senior Secondary School
Preboard Examination 2019-20
Chemistry-XII

Time:3 Hrs.

MM:70

General instructions

All questions are compulsory

- Section A: Question number 1 to 20 are very short answer questions and carry one mark each.
- Section-B: Question number 21 to 27 short answer questions and carry two marks each.
- Section C: Question number 28 to 34 are long answer questions and carry 3 marks each.
- Section D: Question number 35 to 37 are long answer questions and carry 5 marks each.
- There is no overall choice, internal choice has been provided into questions of two marks to questions of three marks and all the three questions of 5 marks. You have to attempt only one of the choices in such question.
- Use log table if necessary.

SECTION A

Read the given passage and answer the questions from 1 to 5 that follow:

Properties of fluorine are different than other halogens due to its smallest size, high electronegativity, low bond dissociation energy and absence of d orbital. Halogens form HX type of hydrides in which X is halogen. They form different types of oxides, which are good oxidizing agent. All halogens are also good oxidizing agent. They also react together to form interhalogen compound. Inter halogen compounds are polar and are more reactive than corresponding halogens.

1. Fluorine forms only HOF oxoacid, give reason.
2. Interhalogen compounds are more reactive than halogens, why?
3. Draw the structure of perchloric acid.
4. What happens when chlorine is passed in hot and concentrated sodium hydroxide solution?
5. F_2 is strongest oxidising agent, give reason.

Questions 6 to 10 are one word answers:

6. Why are aquatic species comfortable in cold water in comparison to warm water?
7. Arrange the following in their increasing order of basic character
 $C_2H_5NH_2$, $(C_6H_5)NHCH_3$, $C_6H_5NH_2$, $(C_2H_5)_2NH$.
8. Name ketohexose which is obtained from sucrose hydrolysis.
- 9 Name the polymer which is obtained by the polymerization of glycine and aminocaproic acid.

OR

Write the monomers of Buna N.

10. Write the reagents required to convert alkyl chloride to alkyl iodide.

Questions 11 to 15 are multiple choice questions:

11. Which of the following relations are not correct –

- i) $\Lambda_m = \kappa \times C$ ii) $\Lambda_m = \kappa / C$
iii) $G=1/R$ iv) $\alpha = \Lambda_m / \Lambda_m^{\circ}$

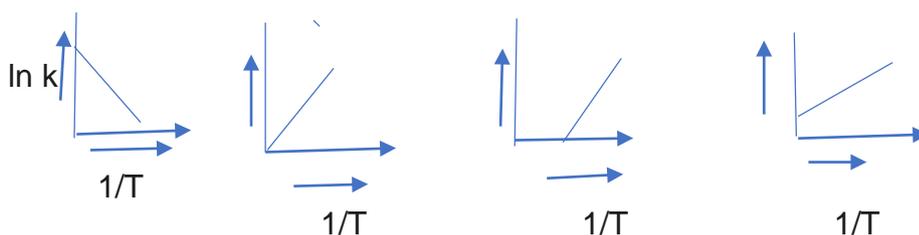
12. Which of following undergoes nucleophilic substitution exclusively by S_N1 mechanism-

- i) Benzyl chloride ii) Ethyl chloride iii) Chlorobenzene iv) isopropyl chloride.

13. Non ideal solutions showing negative deviations is-

- i) Acetone and chloroform
ii) Chloroform and carbon tetrachloride
iii) Chloroform and toluene
iv) Alcohol and water

14. Which of the following represents the graph of $\ln k$ vs $1/T$ according to Arrhenius equation $k = A e^{-E_a/RT}$



15. Which of the following is inner orbital complex-

- i) $[\text{Ni}(\text{CO})_4]$ ii) $[\text{NiCl}_4]^{2-}$ iii) $[\text{Co}(\text{NH}_3)_6]^{3+}$ iv) $[\text{CoF}_6]^{3-}$

16. Phenol on reaction with carbon dioxide at 3-7atm in presence of NaOH followed by acidification gives-

- i) Salicylic acid
ii) Aspirin
iii) Benzoic acid
iv) Methyl salicylate

Questions 16 to 20 are assertion and reasoning type questions:

Use the following key to select the correct answers

- a) If both assertion and reason are correct and correct explanation for assertion
b) Both assertion and reason are correct but reason is not correct explanation for assertion
c) If assertion is correct but reason is incorrect
d) If assertion and reason both are incorrect

17 Assertion: Copper sulphate can be stored in zinc vessel.
Reason: Zinc is less reactive than copper.

18. Assertion: Ethylamine reacts with chloroform and KOH to form an offensive smelling compound whereas diethyl amine does not react.

Reason: Dimethylamine is more reactive than methylamine.

19. Assertion: Aspartame is used in cold food material.

Reason: Aspartame is a dipeptide.

20. Assertion: Glucose on heating with HI gives normal hexane.

Reason: Glucose have a pyranose ring structure.

SECTION B

21. What is pseudo first order reaction? Give an example.

OR

A first order reaction takes 40 minutes for 30% decomposition. Calculate its Half Life.

22. Explain the reactions during the smelting process of haematite ore in blast furnace in different temperature zones.

23. Differentiate between the following-

- i) Fibrous and globular proteins
- ii) Amylose and amylopectin

24. i) What is the role of benzoyl peroxide in addition polymerization of alkenes?

ii) What is the role of sulphur in vulcanization of natural rubber?

25. i) Write the structure of the following compound:-

2 - (2 - chlorophenyl) - 1 - iodoethan-1-ol

ii) Treatment of alkyl halide with aqueous KOH leads to the formation of alcohols but in presence of alcoholic KOH, alkenes are major products. Explain.

26. Draw the shape of the following compounds-

ClF_3 and XeF_6

27. i) What happens when a freshly prepared ferric Hydroxide precipitate is taken with water containing a small quantity of ferric chloride?

ii) What is the role of activated charcoal in gas mask?

SECTION C

28. Calculate the freezing point of an aqueous solution of MgBr_2 in 200g of water, assuming complete ionization of MgBr_2 . Molar mass of MgBr_2 is 284 gram/mol. Molal depression constant of water is 1.86K Kg/mol.

OR

A solution prepared by dissolving 8.95 mg of a gene fragment in 35 ml of water has an Osmotic pressure of 0.335 torr at 25°C. Assuming the gene fragment is a nonelectrolyte, determine its molar mass.

29. Explain the following-

i) Same substance can act both as colloid and crystalloid.

ii) Artificial rain is caused by spraying salt over clouds.

iii) When a beam of light is passed through a colloidal solution, path of light gets illuminated.

30. Give one example for each of the following-

- i) Carbylamines reaction
- ii) Rosenmund's reduction reaction
- iii) HVZ reaction

OR

How can you change--

- i) Aniline to phenol
- ii) Ethanoic acid to methylamine
- iii) Ethane to bromoethene.

31. What happens when -

- i) Phenol is treated with bromine in presence of non-polar solvent.
- ii) Tertiary butyl Chloride is treated with sodium methoxide
- iii) Aniline is reacted with acetic anhydride.

32.a) Mention the action of the following on human body in bringing relief from a disease-

- i) Brompheniramine
- ii) Aspirin
- b) Bithional is added to soap, give reason.

33.i) On the basis of Crystal Field theory, write the electronic configuration a metal ion for d^4 if Δ_o is greater than P .

ii) Draw the geometrical isomers of complex $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$

iii) Give the name of complex of magnesium, which is responsible for photosynthesis.

34. The following rate data were obtained at 300K for the following reaction:



Experiment no	[A] mol l^{-1}	[B] mol l^{-1}	Rate($\text{mol l}^{-1}\text{s}^{-1}$)
1	0.1	0.1	6.0×10^{-3}
2	0.3	0.2	7.2×10^{-2}
3	0.3	0.4	2.88×10^{-1}
4	0.1	0.1	2.4×10^{-2}

What is the rate law? Also calculate the rate constant.

OR

The following data were obtained during the first order thermal decomposition of SO_2Cl_2 at a constant volume: $\text{SO}_2\text{Cl}_2 (\text{g}) \rightarrow \text{SO}_2 (\text{g}) + \text{Cl}_2 (\text{g})$

Experiment	Time/s	Total pressure/atm
1	0	0.5
2	100	0.6

Calculate the rate of reaction when total pressure is 0.65atm.

SECTION D

35. a) Resistance of a conductivity cell filled with 0.1 M KCl solution is 100 Ω . If the resistance of the same cell when filled with 0.02 M KCl solution is 520 Ω . Cell constant of 0.1M KCl is 1.29m^{-1} .

Calculate the conductivity and molar conductivity of 0.02 M KCl solution.

- b) Explain the effect of concentration on the conductivity of an electrolyte solution
 c) Write the product of electrolysis of aqueous copper sulphate by using platinum electrode.

OR

a) State Faraday's first law of electrolysis. How much charge in terms of Faraday is required for the reduction of one mole of Al_2O_3 to Al?

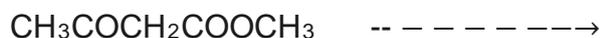
b) Steady Current of 2 ampere was passed through two electrolytic cells X and Y, are connected in series, containing electrolytes ferrous sulphate and zinc sulphate, until 2.8 gram of Fe deposited at the cathode of cell X. Calculate the mass of zinc deposited at cathode of cell Y. Also find out the time required.
 Molar mass of Fe =56 g/mol and Zn=65.3 g/mol.

36. A) Give reason-

- i) Chloroacetic acid has low pK_a value than acetic acid.
 - ii) Cyclohexanone is more reactive than 2,2,6- Trimethylcyclohexanone towards nucleophilic addition reaction.
- b) How can you distinguish
- i) Benzaldehyde and benzoic acid
 - ii) 2-pentanone and 3-pentanone
- c) Write the IUPAC name of propiophenone.

OR

a) Complete the followings-



b) Write the mechanism of the reaction



37.a) Give the preparation of sodium dichromate from iron chromite.

b) Give reasons—

- i) Mn_2O_7 is known but MnF_7 is not.
- ii) Ce^{+4} is a good oxidising agent.
- iii) Mn and Tc have exceptionally low melting point.
- iv) Zn^{2+} salts are white.

OR

a) How can you change manganous salt into permanganate?

b) Draw the structure of $\text{Cr}_2\text{O}_7^{2-}$

c) Give reasons—

- i) Actinoids show the variable oxidation states.
- ii) $E^{\circ}_{\text{Ni}^{2+}/\text{Ni}}$ is -0.25V but $E^{\circ}_{\text{Cu}^{2+}/\text{Cu}}$ is +0.34V.
- iii) Transition elements form alloys.