

CLASS XII

GUESS PAPER

CHEMISTRY

Centre for the advancement of standards in examinations (GEMS Asian Schools)

Common Rehearsal Examination – January 2009

All India Senior school Certificate examination

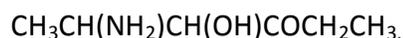
Time-3 Hours

Max.Marks-70

General Instruction:

1. All questions are compulsory.
2. Marks of each question are indicated against it.
3. Questions number 1 to 8 are very short answer questions and carry 1 mark each.
4. Questions numbers 9 to 18 are short answer questions and carry 2 marks each.
5. Question numbers 19 to 27 are also short answer questions and carry three marks each.
6. Question numbers 28 to 30 is long answer questions and carry five marks each.
7. Use log tables if necessary. Use of Calculators are not allowed.

1. Give the IUPAC name



1

2. 1 mol of a hydrate isomer of $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$ gave 2 mols of AgCl precipitate when treated with AgNO_3 solution. Give the formula and IUPAC name of the isomer. 1

3. What is the advantage of colloidal medicines? 1

4. Name the monomers of a copolymer formed by condensation polymerization. 1

5. When your noradrenaline level is low, what you are suffering from? Name the type of drug used in this case. 1
6. Why is it difficult to protonate phenol unlike alcohol? 1
7. Give a distinguishing test for ethylamine and diethyl amine. 1
8. What do you mean by isoelectric point? 1
9. A metal crystallizes into two cubic phases fcc and bcc whose unit cell lengths are 3.5 and 3.0 Å⁰ respectively. Calculate the ratio of densities of fcc and bcc. 2
10. Give reason
- a) V₂O₃ and NiO are antiferromagnetic but changes to paramagnetic at 150K and 523K respectively.
- b) Solids with F - centres are paramagnetic. 2
11. An aqueous solution containing liquid A (mol.wt.=128) is 64% by weight. It shows a vapour pressure of 145 mmHg. Find the vapour pressure of A, if that of water is 155 mm at the same temperature 2
12. For the reaction $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$ under certain conditions of partial pressure and temperature the rate of formation of NH₃ is 0.001 Kghr⁻¹. Calculate the rate of conversion of H₂ under the same conditions. 2
13. Give the mechanism of hydrolysis of
- a) CH₃Cl 2
14. Write short notes on
- a) Aldol condensation
- b) Cannizzaro reaction. 2

OR

Convert

- a) Toluene to benzaldehyde.
b) Benzene to benzoic acid.

2

15. Account for the following

- a) allylic and benzylic halides show high reactivity towards S_N1 reaction.
b) haloarenes are reluctant to undergo nucleophilic substitution reaction.

2

16. Using valence bond approach deduce the shape and magnetic character of $[Cr(CO)_6]$. (At.no. Cr=24). 2

17. a) Ranitidine which is an antihistamine also works as an antacid. Why?

- b) Differentiate between antiseptics and disinfectants with examples.

2

18. How are polymers classified on the basis of molecular forces. Explain.

2

19. Calculate the boiling point of a solution containing 0.16g. of benzoic acid in 50g. of CS_2 assuming 84% dimerization of the acid. The boiling point and K_b of CS_2 are $46.2^\circ C$ and $2.3 K Kg mol^{-1}$ respectively. 3

20. a) The rate law of a chemical reaction $2NO + O_2 \rightarrow 2NO_2$ is given as $rate = k(NO)^2(O_2)$. How will the rate of reaction change, if the volume of reaction vessel is reduced to $1/4^{th}$ of its original value?

- b) Reaction with low activation energy are fast while those with high energy of activation are slow. Prove.

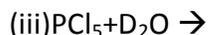
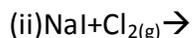
2,1

21. Write short notes on

- a) Multimolecular
b) Macromolecular

- c) Associated colloids. 3
22. Explain the processes involved in the extraction of
- a) High purity Ge
 - b) Nickel
 - c) Titanium. 3
23. Give the mechanism of dehydration of ethanol at 413K. 3
- OR
- Give the mechanism of dehydration of ethanol at 443K
24. Convert
- (a) ethanol to lactic acid
 - (b) acetaldehyde to acetamide.
 - (c) acetone to 2-methyl-2-propanol. 3
25. Give suitable chemical reactions to prove the following properties of the open chain structure of glucose.
- a) straight chain structure of glucose.
 - b) presence of carbonyl group.
 - c) presence of aldehydic group. 3
26. a) An organic compound A having molecular formula C_2H_3N on reduction gave another compound B. Upon treatment with nitrous acid B gave ethylalcohol and on warming with $CHCl_3$ and alc.KOH it formed an offensive smelling compound C. Compound B reacts with acetylchloride to form D which is a secondary amide. Find A,B,C and D
- b) Aniline does not undergo Friedel Craft's reaction. 2,1

27. Complete the following equations(balance if necessary)



3

28. a) The standard potential of the following cell is 0.23V at 15°C and 0.21V at 35°C



(i) Write the cell reaction

(ii) Calculate the maximum work which can be extracted from the above cell at both the temperatures. (1F=96500C)

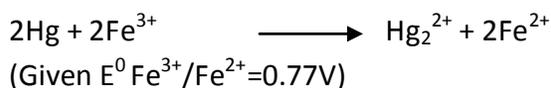
b) Give the electrochemical mechanism of corrosion.

c) Corrosion of motor cars is a major problem in coastal areas. Why?

2,2,1

OR

(a) An excess of liquid mercury is added to an acidified solution of $1.0 \times 10^{-3} \text{ M Fe}^{3+}$. It is found that 5% of Fe^{3+} remains at equilibrium at 25°C. Calculate $E^0 (\text{Hg}_2^{2+}/\text{Hg})$ assuming that the only reaction that occurs is



(b)

Calculate the pH of the following cell.

$\text{Pt}, \text{H}_2/\text{H}_2\text{SO}_4$. The oxidation potential is +0.3V. 3,2

29. a)(i) Discuss the steps involved in the preparation of potassium dichromate from chromite ore.

(ii) What happens to dichromate ion on changing its pH?

(iii) Give the structures of chromate and dichromate ions.

b) Give reason

(i) Zr and Hf show similar atomic size.

(ii) $TiCl_3$ is coloured while $TiCl_4$ is colourless.

3,2

OR

Pyrolusite on heating with KOH in presence of air gives dark green compound (A). The solution of (A) on treatment with H_2SO_4 gives a purple coloured compound (B), which gives the following.

i) KI with alkaline solution of B changes into compound C

ii) The colour of compound (B) disappears on treatment with acidic solution of $FeSO_4$.

iii) Yellow substance (D) is precipitated when H_2S gas is bubbled through acidified solution of (B).

Write balanced chemical/ionic equations for all the above reactions. Identify A, B, C and D.

5

30. (i) Give the method of preparations and the structures of XeF_2 , XeF_4 and XeF_6 .

(ii) Account for the following

a) Xenon form compounds only with Fluorine and Oxygen.

b) SF_6 is not easily hydrolysed.

3,2

OR

Give reason

i) Dinitrogen is inert at room temperature

ii) Ozone is thermodynamically unstable with respect to oxygen.

iii) Exhaust systems of supersonic jet aeroplanes can deplete ozone layer in the upper atmosphere.

iv) Sulphur in vapour state shows paramagnetic behavior.

v) Chlorine water on standing loses its yellow colour.

5