

CLASS XII

GUESS PAPER-02

CHEMISTRY(Theory)(43/2)

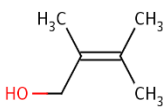
PRE-BOARD 1 EXAMINATION (2017-18)

Time allowed : 3 Hours

Maximum Marks: 70

General Instructions:

- (i) *All questions are compulsory.*
- (ii) *Questions number 1 to 5 are very short-answer questions and carry 1 mark each.*
- (iii) *Questions number 6 to 10 are short-answer questions and carry 2 marks each.*
- (iv) *Questions number 11 to 22 are also short-answer questions and carry 3 marks each.*
- (v) *Question number 23 is value based question and carries 4marks.*
- (vi) *Questions number 24 to 26 are long-answer questions and carry 5marks each.*
- (vii) *Use log tables if necessary. Use of calculators is **not** allowed.*

1. Physisorption is reversible while chemisorptions in irreversible. Why ? 1
2. What is the effect of adding a catalyst on Activation energy (E_a) ? 1
3. C-X bond length in halobenzene is smaller than C-X bond length in $\text{CH}_3\text{-X}$. Give reason. 1
4. Write the formula of gas which is obtained on thermal decomposition of NH_4NO_3 . 1
5. Write the IUPAC name of  1
6. An element with density 10 g cm^{-3} forms a cubic unit cell with edge length of $3.0 \times 10^{-8} \text{ cm}$. What is the nature of the cubic unit cell if the atomic mass of the unit cell is 81 g/mol ? 2
7. What type of battery is Lead storage battery ? Write the cathode and anode reactions and the overall cell 2
8. Draw the structures of the following molecules: 2
 - (i) XeOF_4 (ii) HOClO_2

- 9.i) Write the IUPAC name of $[\text{Pt}(\text{NH}_3)(\text{H}_2\text{O})\text{Cl}_2]$ 2
 ii) Identify the type of isomerism exhibited by $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Cl}$.

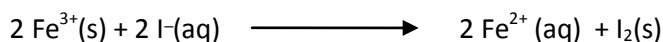
10. How are the following conversions carried out? 2
 (i) Phenol to Anisole.
 (ii) Methylmagnesium bromide to 2-Methylpropan-2-ol.

OR

What happens when :

- (i) Ethyl chloride is treated with NaOCH_3 .
 (ii) Phenol is treated with $\text{CH}_3\text{COCl}/\text{Anhydrous AlCl}_3$.

- 11.i) The cell in which the following reaction occurs : 2+1



Has $E^{\circ}_{\text{cell}} = 0.236 \text{ V}$ at 298 K. Calculate the standard Gibbs energy of the cell reaction. [Given $1 \text{ F} = 96500 \text{ C mol}^{-1}$]

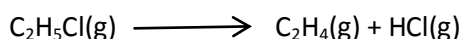
- ii) How many electrons flow through a metallic wire if a current of 0.5 A is passed for 2 hours ?

- 12.i) Why are crystalline solids anisotropic ? 3

ii) What type of Semiconductor is obtained when Silicon is doped with Arsenic ?

iii) What type of defect can arise when a solid is heated ?

13. For the first order thermal decomposition reaction, the following data were obtained : 3



| Time/Sec | Total pressure/atm |
|----------|--------------------|
| 0 | 0.30 |
| 300 | 0.50 |

Calculate the rate constant. [Given $\text{Log } 2 = 0.3010, \text{Log } 3 = 0.4771, \text{Log } 4 = 0.6021$]

14. Write the principle of the following : (i) Zone refining (ii) Vapour phase refining (iii) Liquation 3

15. Give reason : 3

i) H_3PO_2 is stronger reducing agent than H_3PO_3 .

ii) NH_3 is a stronger base than PH_3 .

iii) White phosphorus is more reactive than red phosphorus.

16.(i) Write the Hybridisation, Geometry, Magnetism and Spin of $[\text{Co}(\text{NH}_3)_6]^{3+}$ 2+1

(At.no. of Co = 27)

(ii) Why is complex $[\text{Co}(\text{en})_3]^{3+}$ more stable than $[\text{CoF}_6]^{3-}$?

17.i) What is the type of charge on AgI colloidal sol formed when AgNO_3 solution is added to KI ? 1+2

ii) Differentiate between : (a) Lyophilic and Lyophobic sols (b) Homogeneous and Heterogeneous catalysis

18. Write chemical equations for the following conversions: 3

(i) Nitrobenzene to benzoic acid

(ii) Methyl bromide to Ethanamine

(iii) Aniline to Bromobenzene.

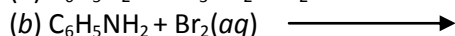
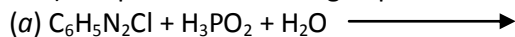
19. Answer the following: 3

(i) Haloalkanes easily dissolve in organic solvents, why?

(ii) Racemic mixture is optically inactive ? Why ?

(iii) Of the two bromoderivatives, $\text{C}_6\text{H}_5\text{CH}(\text{CH}_3)\text{Br}$ and $\text{C}_6\text{H}_5\text{CH}(\text{C}_6\text{H}_5)\text{Br}$, which one is more reactive in $\text{S}_\text{N}1$ substitution reaction and why?

20.i) Complete the following equations: 2+1



ii) Describe the Coupling reaction giving the relevant chemical equation .

21.i) Differentiate between Addition and Condensation polymerisation with an example each. 2+1

ii) Write the names and structures of the monomers of Glyptal.

22. Answer **Any Three** of the following : 3

i) Why is the use of Aspartame limited to cold foods and soft drinks?

ii) What are disinfectants ? Give an example.

iii) Why is Bithional added to soap ?

iv) Explain the term Analgesic .

23. Sudha was taught by the science teacher about Vitamins A, B, C, D, E, and K, their classification, specific names and that vitamin B12 contains a metal ion. The homework task was to find out the metal ion but Sudha during the interval time went to the Computer lab and requested the teacher to surf the net and she traced the name of the metal ion. 4

- What virtues were possessed by Sudha?
- Write the name of disease caused by deficiency of Vitamin D in children.
- Classify the above mentioned vitamins.
- Which metal ion is present in Vitamin B12?

24. a) Explain why a solution of Chloroform and Acetone shows negative deviation from Raoult's law. 2+3
b) 18 g of Glucose $C_6H_{12}O_6$ (Molar mass = 180 g mol^{-1}) is dissolved in 1 Kg of water in a pan. At what temperature will this solution boil? (K_b for water = $0.52 \text{ K kg mol}^{-1}$; Boiling point of water = 373.15 K)

OR

- Write two differences between a solution showing positive deviation and a solution showing negative deviation.
- Calculate the temperature at which a solution containing 54 g of glucose ($C_6H_{12}O_6$) in 250 g of water will freeze. (K_f for water = $1.86 \text{ K kg mol}^{-1}$)

25. Give Reasons :

5

- MnO is basic whereas Mn_2O_7 is acidic in nature.
- Transition metals form a large number of complex compounds.
- Zinc is not regarded as a transition element.
- Zn^{2+} salts are white whereas Cu^{2+} salts are coloured.
- Transition metals and their compounds show catalytic properties.

OR

- Write the reactions for the formation of Potassium dichromate from Iron chromite ore.
- What happens when $KMnO_4$ is heated? Write the equation.
- The enthalpies of atomization of transition metals are quite high.

26. a) Give chemical tests to distinguish between the following:

2+3

- Propanal and Propanone.
- Benzoic acid and Phenol

b) How will you convert the following :

- Benzoic acid to Benzamide.

- ii) Sodium benzoate to Benzene .
- iii) Ethanal to But-2-enal.

OR

a) Illustrate the given name reactions :

- (i) Hell Volhard Zelinsky reaction. (ii) Wolff Kishner reduction

b) How will you convert the following :

- i) Toluene to Benzoic acid.
- ii) Ethanoic acid to Acetyl chloride .
- iii) Methanal to Methanol.
