

**KENDRIYA VIDYALAYA SANGATHAN CHENNAI REGION
COMMON PRE-BOARD EXAMINATION 2015-16**

CLASS-XII

CHEMISTRY

**TIME:3HRS
MAX.MARKS-70**

Instructions:

- Answer all the questions.
- Questions 1 to 5 are very short answer type and carry one mark each. Answer them in one word or in one sentence.
- Questions 6 to 10 are short answer type and carry 2 marks each. Answer them in 20 words.
- Questions 11 to 22 are short answer type and carry 3 marks each. Answer them in 30 words.
- Question 23 is value based question and carry 4 marks.
- Questions 24 to 26 are long answer type and carry 5 marks each. Answer them in 50 to 60 words.
- All 5 mark questions, one 3 mark question and one 2 mark question have internal choice. There is no overall choice.
- Use log book wherever needed. Use of calculator or any other electronic item is strictly prohibited.

1. What is the difference between lyophilic sol and lyophobic sol? 1
2. Give the IUPAC name of the following compound: 1
- $$\text{H}_2\text{C} = \text{CH} - \underset{\substack{| \\ \text{OH}}}{\text{CH}} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$$
3. Give a test to distinguish between pentan-2-one and pentan-3-one 1
4. What is Hinsberg's reagent and what is it used for? 1
5. Name the products of hydrolysis of sucrose 1
6. How the vapour pressure of a solvent is affected when a non-volatile solute dissolved in it? 2
7. State Kohlrausch law of independent migration of ions. Why does the conductivity of a solution decrease with dilution? 2
8. Give reason: 2
- (i) p-dichloro benzene has high melting point than the o- & m-dichlorobenzene.
- (ii) Aryl halides are less reactive than alkyl halides towards nucleophilic substitution reaction.
- OR
- (i) What is known as a racemic mixture? Give an example
- (ii) 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?
9. Explain why 2
- (i) Grignard reagents should be prepared in anhydrous conditions
- (ii) Alkyl halides, though polar, are immiscible with water

10. Give reason for the following: 2
 (i) CH_3CHO is more reactive than CH_3COCH_3 towards reaction with HCN
 (ii) Carboxylic acid is stronger than phenol
11. A solution of glucose (molar mass = 180 g mol^{-1}) in water is labelled as 10% by mass). What would be the molality and molarity of the solution? 3
 (Density of solution = 1.2 g mL^{-1})
12. Calculate the emf of the following cell at 298K 3

$$\text{Mg(s)} \mid \text{Mg}^{2+}(0.1 \text{ M}) \parallel \text{Cu}^{2+}(0.01) \mid \text{Cu(s)}$$
 [Given $E_{\text{cell}}^{\circ} = +2.71 \text{ V}$, $1 \text{ F} = 96500 \text{ C mol}^{-1}$]
13. Explain what is observed 3
 (i) When a beam of light is passed through a colloidal sol
 (ii) An electrolyte, NaCl is added to hydrated ferric oxide sol
 (iii) Electric current is passed through a colloidal sol
14. Write the role of the following: 3
 (i) CO in the purification of nickel
 (ii) Graphite rod in the electrometallurgy of aluminium
 (iii) SiO_2 in the extraction of copper from copper matte
15. Complete the following chemical reactions: 3
 i) $\text{P}_4 + \text{NaOH} + \text{H}_2\text{O} \rightarrow$
 ii) $\text{XeF}_4 + \text{O}_2\text{F}_2 \rightarrow$
 iii) $2\text{NaOH} + \text{Cl}_2 \rightarrow$
16. Draw the structures of geometrical and optical isomers of each of the following complex ions: 3
 (i) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$
 (ii) $[\text{Co}(\text{en})_3]^{3+}$
 (iii) $[\text{Co}(\text{NH}_3)_3(\text{NO}_2)_3]$
 OR
 Giving a suitable example for each, explain the following:
 (i) Ambidentate ligand
 (ii) Co-ordination isomerism
 (iii) Crystal field splitting
17. How would you convert the following: 3
 (i) Benzyl chloride to Benzyl alcohol
 (ii) Phenol to 2,4,6 tri nitro Phenol
 (iii) Propene to Propan-2-ol
18. Write the products in the following: 3
 (i) $\text{CH}_3 - \text{COOH} \xrightarrow{\text{Br}_2/\text{P}} ?$
 (ii) $\text{CH}_3 - \text{CHO} \xrightarrow{\text{LiAlH}_4} ?$
 (iii) $\text{CH}_3 - \underset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{CH}_3 \xrightarrow[\text{conc. HCl}]{\text{Zn - Hg}} ?$
19. Account for the following :- 3
 (i) Aniline does not give Friedel - Crafts reaction

- (ii) Ethylamine is soluble in water whereas aniline is not
- (iii) pK_b of methylamine is less than that of aniline

20. Write the names and structures of monomers used for getting the following polymers: 3
- (i) Teflon
 - (ii) Bakelite
 - (iii) Neoprene
21. Answer the following: 3
- (i). Deficiency of which vitamin cause scurvy?
 - (ii). What type of linkage is responsible for the formation of proteins?
 - (iii) Write the product formed when glucose is treated with HI
22. (i) Which one of the following is a food preservative 3
- Equanil, Morphine, Sodium benzoate
- (ii) Why is bithional added to soap?
 - (iii) Which class of drugs is used in sleeping pills?
23. Energy we obtain from the sun is quantized in nature. So, problem of electricity can be resolved by using solar energy. Solar energy can be employed for useful purposes by various means. For production of electricity solar cell plates are used. These convert heat energy into electrical energy. These plates are made up of silicon semiconductor doped with group 13 and group 15 elements like boron and arsenic. 4
- Now answer the following questions:
- i. How do added impurities modify the property of a conductor?
 - ii. Name one semiconductor which revolutionised the design of semiconductor devices.
 - iii. What are the values associated in using solar cells?
24. (a) Define the following terms: 5
- (i) Rate of reaction
 - (ii) Activation energy of a reaction
- (b) Sucrose decomposes in acid solution into glucose and fructose according to the first order rate law. With $t_{1/2} = 3.00$ hours. What fraction of sample of sucrose remains after 8 hours?

OR

- (a) Define the following terms:
- (i) Order of a reaction
 - (ii) Molecularity of a reaction
- (b) The rate of a reaction quadruples when the temperature changes from 293 K to 313 K. Calculate the energy of activation of the reaction assuming that it does not change with temperature.

- (a) How do you prepare:
- K_2MnO_4 from MnO_2 ?
 - $\text{Na}_2\text{Cr}_2\text{O}_7$ from Na_2CrO_4 ?
- (b) Account for the following:
- Mn^{2+} is more stable than Fe^{2+} towards oxidation to +3 state.
 - The enthalpy of atomization is lowest for Zn in 3d series of the transition elements.
 - Actinoid elements show wide range of oxidation states.

OR

- Name the element of 3d transition series which shows maximum number of oxidation states. Why does it show so?
- Which transition metal of 3d series has positive $E^0(\text{M}^{2+}/\text{M})$ value and why?
- Out of Cr^{3+} and Mn^{3+} , which is a stronger oxidizing agent and why?
- Name a member of the lanthanoid series which is well known to exhibit +2 oxidation state.
- Complete the following equation:
 $\text{MnO}_4^- + 8 \text{H}^+ + 5\text{e}^- \rightarrow$

26. (a) Give reasons for the following:

- Bond enthalpy of F_2 is lower than that of Cl_2
- PH_3 has lower boiling point than NH_3

(iii) H_2S is less acidic than H_2Te

- (b) Draw the structures of the following molecules:

- BrF_3
- $(\text{HPO}_3)_3$.

OR

- (a) Account for the following:

- Helium is used in diving apparatus
 - Fluorine does not exhibit positive oxidation state
 - Oxygen shows catenation behaviour less than sulphur
- (b) Draw the structures of the following molecules:
- XeF_2
 - $\text{H}_2\text{S}_2\text{O}_8$.