SY-25

Reg. No. : .....

Name : .....

SECOND YEAR HIGHER SECONDARY
SECOND TERMINAL EXAMINATION, DECEMBER-2023

Part – III

CHEMISTRY

Time : 2 Hours

Cool-off time : 15 Minutes

Maximum : 60 scores

General Instructions to Candidates :

- There is a 'Cool-off time' of 15 minutes in addition to the writing time.
- Use the 'Cool-off time' to get familiar with questions and to plan your answers.
- Read questions carefully before answering.
- Read the instructions carefully.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Malayalam version of the questions is also provided.
- Give equations wherever necessary.
- Electronic devices except non-programmable calculators are not allowed in the Examination Hall.

വിദ്യാർത്ഥികൾക്കുള്ള പൊതുനിർദ്ദേശങ്ങൾ :

- നിർദ്ദിഷ്ട സമയത്തിന് പുറമെ 15 മിനിറ്റ് 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും.
- 'കൂൾ ഓഫ് ടൈം' ചോദ്യങ്ങൾ പരിചയപ്പെടാനും ഉത്തരങ്ങൾ ആസൂത്രണം ചെയ്യാനും ഉപയോഗിക്കുക.
- ഉത്തരങ്ങൾ എഴുതുന്നതിന് മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- നിർദ്ദേശങ്ങൾ മുഴുവനും ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- കണക്ക് കൂട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ, എന്നിവ ഉത്തരപേപ്പറിൽ തന്നെ ഉണ്ടായിരിക്കണം.
- ചോദ്യങ്ങൾ മലയാളത്തിലും നല്കിയിട്ടുണ്ട്.
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ കൊടുക്കണം.
- പ്രോഗ്രാമുകൾ ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരീക്ഷാഹാളിൽ ഉപയോഗിക്കുവാൻ പാടില്ല.

Answer any 4 questions from 1 to 5. Each carries 1 score. **(4 × 1 = 4)**

1. The general outer electronic configuration of d-block element is _____.

2. The oxidation number of Cobalt in $[Co(NH_3)_6Cl]Cl_2$ is _____.

3. $C_2H_5 - OH + A \rightarrow C_2H_5 - Cl + POCl_3 + HCl$

   Identify the reagent 'A'.

4. The most acidic alcohol among the following :

   (a) $C_2H_5 - OH$ (b) $C_3H_7 - OH$

   (c) $CH_3 - OH$ (d) All of the above

5. Draw the structure of 4-Nitrobenzaldehyde.

Answer any 8 questions from 6 to 15. Each carries 2 scores. **(8 × 2 = 16)**

6. How much electricity in terms of Farads is required to produce ?

   (a) 20 g of Ca from $CaCl_2$

   (b) 54 g of Al from $AlCl_3$

7. The rate constant of a reaction is 5×10^{-2} s^{-1}. Find the half life of the reaction.

8. What are the postulates of Werner's theory ?

9. Write down the IUPAC names of the following compounds :

(i) $K_3[Fe(C_2O_4)_3]$ **(1)**

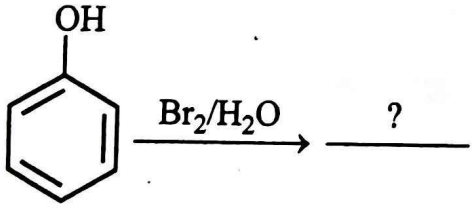
(ii) $[Pt(NH_3)(H_2O)Cl_2]$ **(1)**

10. Alkylhalides, though polar are immiscible with water. Why ?

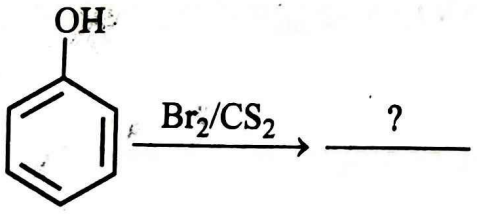
11. Identify the compounds 'X' and 'Y' in the following :

$$C_2H_4 \xrightarrow{HBr} X \xrightarrow{\text{aq. NaOH}} Y$$

12. The dehydration of alcohol follows the order $3° > 2° > 1°$. Why ?

13. (a) 

(1)

(b) 

(1)

14. Explain Gattermann-Koch reaction.

15. Give simple chemical test to distinguish between Propanal and Propanone.

Answer any 8 questions from 16 to 26. Each carries 3 scores. **(8 × 3 = 24)**

16. (a) What happens to a metal during corrosion ? **(1)**

(b) Explain the electrochemical rusting of iron. **(2)**

17. (a) Ore of $K_2Cr_2O_7$ is _____. **(1)**

(b) Give an example of a reaction in which $K_2Cr_2O_7$ acts as an oxidising agent in acid medium. **(1)**

(c) Draw the structure of chromate ion. **(1)**

18. Explain the crystal field splitting in tetrahedral and octahedral complexes with the help of neat diagrams.

19. Identify the structure and magnetism of $[CoF_6]^{3-}$ using valance bond theory.

20. (a) Why geometrical isomerism is not possible in tetrahedral complexes having two different types of unidentate ligand co-ordinated with central metal ion ? **(2)**

(b) Draw the Cis and trans isomers of MA_2B_2. **(1)**

21. Explain the Sterio chemical aspects of S_N1 and S_N2 reactions of alkyl halides with suitable examples.

22. (a) The boiling point of alcohols are higher than the boiling point of ethers with the same number of carbon atoms. Explain. **(1)**

(b) How will you convert phenol to Picric acid ? Give reaction. **(2)**

23. Explain the chemical test to distinguish between 1°, 2° and 3° alcohols.

24. (a) Explain Cannizzaro reaction and aldol condensation. **(2)**

(b) What is the difference between the above two reactions ? **(1)**

25. (a) Which among the following is a stronger acid ?

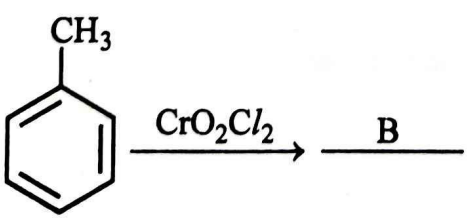
(i) $CH_2ClCOOH$ (ii) CH_3COOH **(1)**

(b) Explain the reason for the above. **(1)**

(c) How will you convert CH_3COOH to $CH_2ClCOOH$? **(1)**

26. Identify A, B and C :

(a) $CH_3 - COCl + H_2 \xrightarrow{A} CH_3 - CHO + HCl$ **(1)**

(b)  **(1)**

(c) $CH_3 - CH_2 - OH \xrightarrow{\text{Pyridinium Chloro Chromate}} C$ **(1)**

Answer any 4 questions from 27 to 31. Each carries 4 scores. **(4 × 4 = 16)**

27. (a) Why do gases always tend to be less soluble in liquid as the temperature increases ? **(2)**

(b) The value of Van't Hoff factor (i) for aqueous KCl is nearly 2 and the value of 'i' for $CH_3 - COOH$ is nearly 0.5. Give reason. **(2)**

28. Explain the structural isomerism of co-ordination compounds.

29. (a) Which among the following will react faster with aqueous KOH ?

CH_3Br and CH_3I **(1)**

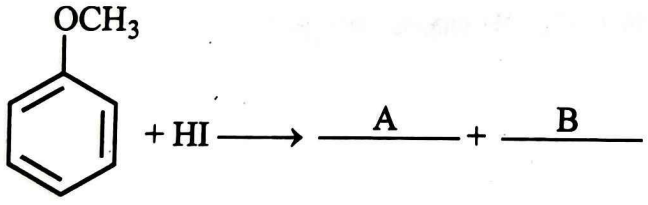
(b) Give reason. **(1)**

(c) Write any two electrophilic substitution reactions of chlorobenzene. **(2)**

30. (a) What is Power alcohol ? **(1)**

(b) Why phenol is more acidic than alcohol ? Explain. **(2)**

(c) Identify A and B :



(1)

31. How will you convert ?

(a) Ethanoic acid to Ethanol **(1)**

(b) Toluene to Benzoic acid **(1)**

(c) CH_3MgX to CH_3COOH **(1)**

(d) $CH_3 - CN$ to $CH_3 - CHO$ **(1)**