

Reg. No.:

Name:

SECOND YEAR HIGHER SECONDARY EXAMINATION SAMPLE QUESTION PAPER

**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 of 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.
- Give equations wherever necessary.
- Electronic devices except non programmable calculators are not allowed in the examination hall.

വിദ്യാർത്ഥികൾക്കുള്ളപൊതുനിർദ്ദേശങ്ങൾ

- നിർദ്ദിഷ്ടസമയത്തിന്പുറമെ 15 മിനിട്ടു 'കൂൾഓഫ് ടൈം' ഉണ്ടായിരിക്കും
- 'കൂൾഓഫ് ടൈം' ചോദ്യങ്ങൾ പരിചയപ്പെടാനും ഉത്തരങ്ങൾ ആസൂത്രണം ചെയ്യാനും ഉപയോഗിക്കുക
- ഉത്തരങ്ങൾ എഴുതുന്നതിനുമുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം
- നിർദ്ദേശങ്ങൾ മുഴുവനും ശ്രദ്ധാപൂർവ്വം വായിക്കണം
- കണക്കുകൂട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ എന്നിവ ഉത്തരക്കടലാസിൽ തന്നെ ഉണ്ടായിരിക്കണം
- ആവശ്യമുള്ള സ്ഥലത്തു സമവാക്യങ്ങൾ കൊടുക്കണം
- പ്രോഗ്രാമുകൾ ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരീക്ഷണാളിയിൽ ഉപയോഗിക്കുവാൻ പാടുള്ളതല്ല

SECOND YEAR HIGHER SECONDARY EXAMINATION

Part – III

Time:2 Hours

CHEMISTRY

Maximum:60 Scores

A. Answer any 4 questions from 1 to 5 .Each carries 1 score.

1. An ambident nucleophile is:
i) Ammonia ii) Ammonium ion iii) Chloride ion iv) Nitrite ion .
2. Write the IUPAC name of $[\text{Ni}(\text{CO})_4]$
3. Which of the following is not a colligative property?
(a) Osmotic pressure (b) Vapour pressure (c) Elevation of boiling point (d) Depression of freezing Point.
4. Identify the order of reaction if the unit of rate constant is $\text{mol L}^{-1} \text{s}^{-1}$.
5. Which of the following is not a polyhalogen compound?
(a) Chloroform (b) Freon (c) Carbon tetrachloride (d) Chloro benzene .

B. Answer any 8 questions from 6 to 15 .Each carries 2 score.

- 6.a) Phenol when treated with Conc. HNO_3 gives,
(i) o-Nitrophenol (ii) p-Nitrophenol (iii) 2,4,6-Trinitrophenol (iv) a mixture of nitrophenol and p-nitrophenol. (1)
- b) Methanol and ethanol are two commercially important alcohols. Write one method for the preparation of methanol. (1)
7. Give one use each of Freon 12, DDT, CCl_4 and CHI_3 .
8. Aryl halides are less reactive in nucleophilic substitution reactions.
i) Write any two reasons for less reactivity. (1)
ii) Give one example for nucleophilic substitution reactions of aryl halides. (1)
9. How is a primary amine distinguished from a secondary amine using a chemical test?
10. Differentiate molecularity and order of a reaction.
11. Give reasons.
(a) Transition metals and many of their compounds act as catalyst. (1)
(b) Scandium ($Z = 21$) does not exhibit variable oxidation state and yet it is regarded as a Transition element. (1)
12. Write the equations of the reactions involved at each electrode in a $\text{H}_2 - \text{O}_2$ fuel cell.
13. The conversion of molecules A to B follows second order kinetics. If concentration of A is increased to three times, how will it affect the rate of formation of B?
- 14.i) What is zwitter ion? (1)

- ii) What is a peptide linkage? (1)
15. Cane Sugar, Glucose and Starch are Carbohydrates.
- Represent the structure of Glucose. (1)
 - Write a method to prepare Glucose from Starch. Write the chemical equation of the reaction. (1)

C . Answer any 8 questions from 16 to 26 .Each carries 3 score.

16. Explain the preparation of phenol from
- cumene
 - Diazonium Chloride
17. How will you distinguish primary, secondary and tertiary alcohols by Lucas test
18. Amines are basic in nature.
- Arrange the following compounds in the increasing order of their basic strength.
 NH_3 , $\text{C}_2\text{H}_5\text{NH}_2$, $\text{C}_6\text{H}_5\text{NH}_2$, $(\text{C}_2\text{H}_5)_2\text{NH}$ (1)
 - How will you convert aniline to chlorobenzene? (2)
19. How would you account for the followings :
- Aldehydes are more reactive than ketones towards nucleophilic addition reaction.
 - Boiling point of aldehydes are lower than alcohols.
 - Addition reaction of sodium hydrogen sulphite is useful for the separation and purification of aldehydes.
20. The effect of temperature on rate of reaction is given by Arrhenius equation.
- Write Arrhenius equation. (1)
 - Define activation energy (E_a) (2)
21. Henry's law is related to solubility of a gas in liquid.
- State Henry's law. (1)
 - 1000cm^3 of an aqueous solution of a protein contains 1.26 g of the protein. The osmotic pressure of such a solution at 300K is found to be 2.57×10^{-3} bar. Calculate the molar mass of the protein. ($R = 0.083 \text{ Lbar/K/mol}$). (2)
22. a) Represent the galvanic cell based on the cell reaction given below:
 $\text{Cu(s)} + 2 \text{Ag}^+(\text{aq}) \rightarrow \text{Cu}^{2+}(\text{aq}) + 2 \text{Ag(s)}$ (1)
- Write the half cell reactions of the above cell. (1)
 - λ^0_m for NaCl, HCl and NaAc are 126.4, 425.9 and $91.0 \text{ S cm}^2 \text{ mol}^{-1}$ respectively. Calculate λ^0_m for HAc. (2)
23. Galvanic cells are classified into primary and secondary cells.
- Write any two differences between primary and secondary cells. (2)
 - (i) What is a fuel cell? (1)
 (ii) Write the overall cell reaction lead storage battery. (1)
24. Derive the integrated rate equation of first order reaction.
25. Aromatic amines are important synthetic intermediates.
- What are the products obtained when aniline is treated with bromine water? (1)
 - How will you convert nitrobenzene to aniline? (1)
 - Write down the isocyanide test for the primary amines. (1)
26. Proteins are important polymers of biological systems.
- What is denaturation of proteins? (2)
 - Give two examples of denaturation. (1)

D. Answer any 4 questions from 27 to 31 .Each carries 4 score.

27. On kinetic consideration nucleophilic substitution in aryl/alkyl halides may be SN^1 or SN^2 mechanisms. Briefly explain SN^2 & SN^1 mechanism with an example.
28. a) Methanal (HCHO) is an aldehyde having no α -hydrogen atom. What are the products formed when methanal is treated with strong KOH solution?
b) How are the following conversions achieved?
i) Benzoyl chloride (C_6H_5COCl) to benzaldehyde (C_6H_5CHO)
ii) Acetic acid (CH_3COOH) to chloroacetic acid ($CH_2ClCOOH$)
iii) Benzene to Benzaldehyde (1 X 4 = 4)
29. The value of rate constant k of a reaction depends on temperature. From the values of k at two different temperatures, the Arrhenius parameters E_a and A can be calculated. The rate constants of a reaction at 1000K and 1060K are $0.01M^{-1}s^{-1}$ and $0.10M^{-1}s^{-1}$ respectively. Find the values of E_a and A .
30. a) Potassium dichromate ($K_2Cr_2O_7$) is an important compound of chromium. Describe the method of preparation of potassium dichromate from chromite ore. (3)
b) The gradual decrease in the size of lanthanoid elements from lanthanum to lutetium is known as lanthanoid contraction. Write any one consequence of lanthanoid contraction.(1)
31. Colligative properties are properties of solution which depend on the number of solute particles in the solution irrespective of their nature.
a) Name the four important colligative properties. (2)
b) What happens to the colligative properties when ethanoic acid is treated with benzene? Give reason. (2)

1.Sivaprasad, GHSS Kakkavayal

2.Darly,WOHSS Pinangode

3.Anitha P C,GSVHSS Bathery

4.Trishna P,GHSS Anappara

5.Rasmi S,SNHSS Poothadi

6.Jeshiya mol,RCHSS Chundele

7.Anish Varghese,DVVHSS Veliambam

8.Benny V J,SMCHSS bathery

9.Chandana,GMHSS Cheeral