SECOND YEAR HIGHER SECONDARY EXAMINATION

Part-III

CHEMISTRY

Time: 2Hours

Maximum: 60 Scores

Cool-off time: 15 minutes

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 theExamination Hall. :

വിദ്യാർത്ഥികൾക്കുള്ള പൊതു നിർദേശങ്ങൾ

- നിർദ്ദിഷ്ടസമയത്തിനു പുറമെ 15 മിനിറ്റ് ' കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും.
- ' കൂൾ ഓഫ് ടൈം' ചോദ്യങ്ങൾ പരിചയപ്പെടാനും ഉത്തരങ്ങൾ ആസൂത്രണം ചെയാനും ഉപയോഗിക്കുക
- ഉത്തരങ്ങൾ എഴുതുന്നതിനു മുൻപ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവം വായിക്കണം
- കണക്ക്കൂട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ എന്നിവ ഉത്തരപേപ്പറിൽ തന്നെ ഉണ്ടായിരിക്കണം
- ചോദ്യങ്ങൾ മലയാളത്തിലും നല്കിയിട്ടുണ്ട്
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ കൊടുക്കണം
- പ്രോഗ്രാമുകൾ ചെയ്യാനാവാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരീക്ഷാഹാളിൽ ഉപയോഗിക്കുവാൻ പാടില്ല

A. Answer any four questions from 1 to 5. Each carries 1 score (1 x 4= 4)

1. The rate constant of the reaction k= 2.3 x 10^{-5} L mol^{-1} S^{-1}. The order of the reaction is ……
2. Write the general electronic configuration of d block elements
3. Write the formula Tetraamminediaquacobalt (III) chloride
4. Chloroflurocarbons of methane and ethane are collectively called……..
5. Which of the following compound do not undergo Cannizzaro reaction

   a) C_6H_5CHO b) HCHO

   c) CH_3CHO d) CCl_3CHO

B. Answer any eight questions from 6 to 15. Each carries 2 scores (2 x 8= 16)

6. Define Henry's law and write any one application
7. Why osmotic pressure measurement is the best method to determine molecular mass of biomolecules and polymers?
8. State Kohlrausch law of independent migration of ions
9. Write Arrhenius equation and explain the terms involved in it
10. What is lanthanoide contraction and mention its consequences?
11. Draw geometrical isomers of $[CoCl_2(en)_2]^+$
12. Complete the following

    a) $CH_3\text{-}CH_2OH + SOCl_2 \longrightarrow$ ……. + SO_2 + HCl

    b) $CH_3\text{-}CH_2\text{-}CH_2\text{-}Cl + KCN \longrightarrow$ ……. + KCl

13. Define the following reaction

    a) Carbylamine reaction
    b) Hoffmann bromamide reaction

14. Define the following
    a) Glycosidic linkage
    b) Peptide linkage
15. Name the products obtained when phenol react with concentrated HNO_3 and dilute HNO_3

C. Answer any eight questions from 16 to 26. Each carries 3 scores (3 x 8= 24)

16. How Standard Hydrogen Electrode is constructed? What is its potential?

17. The rate constant of a reaction at 500K is $2.0 \times 10^{-2}\ S^{-1}$. When the temperature is increased by 200K, rate constant is increased to $7.0 \times 10^{-2}\ S^{-1}$. Calculate E_a of the reaction

18. (i) Write the integrated rate equation for the first order reaction?

    (ii) Show that $t_{1/2}$ of first order reaction is independent of initial concentration of reactants

19. Explain the method of preparation of potassium dichromate from chromite ore

20. Magnetic behaviour of a complex compound can be explained on the basis of VBT. $[Co(NH_3)_6]^{3+}$ is a diamagnetic complex and $[CoF_6]^{3-}$ is a paramagnetic complex. Substantiate the above statement using VBT.

21. How will you distinguish 1^0, 2^0, 3^0 alcohols?

22. (i) How will you prepare ethanol using Grignard reagent ?

    (ii) Explain Williamson synthesis

23. Explain aldol condensation taking CH_3CHO as an example

24. Complete the following reactions

    a. $HCHO + \text{Conc. } KOH \xrightarrow{\Delta}$ ……

    b. $CH_3CHO + H_2N\text{-}NH_2 \longrightarrow$ .....

25. Amines are basic in nature

    a. Arrange the following compounds in the increasing order of their basic strength

       NH_3, $C_2H_5NH_2$, $C_6H_5NH_2$, $(C_2H_5)_2NH$

    b. How will you convert aniline to chlorobenzene

26. What are anomers? Draw the pyranose structure of glucose

D. Answer any four questions from 27 to 31. Each carries 4 scores (4 x 4= 16)

27. Colligative properties are properties of solution which depend on the number of solute particles in the solution

    a. Write the names of four important colligative properties? **(2)**

b. The value of van't Hoff factor *i* for an aqueous KCl solution is close to 2.0 ,While that of ethanoic acid in benzene is nearly 0.5. Give reason **(2)**

28. a) Represent the galvanic cell based on the cell reaction given below

$$Cu_{(s)} + 2Ag^{+}{}_{(aq)} \longrightarrow Cu^{2+}{}_{(aq)} + 2Ag_{(s)}$$ **(1)**

b) Write the half cell reaction of the above cell **(2)**

c) Write the Nernst equation for the above cell **(1)**

29. Explain the structural isomerism in coordination compounds with one example for each category

30. a)Briefly explain SN^2 mechanism with an example **(2)**

b) In dehydrohalogenation of 2-Bromo pentane, the major product is Pent-2-ene why?

31. (i) How will you bring about the following conversions
    a. Toluene to benzoicacid **(1)**
    b. Acetic acid to chloro acetic acid **(1)**

    (ii) Write a test to distinguish between
    a. Ethanal and acetone **(1)**
    b. Ethanal and propanal **(1)**

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Prepared by

1. Maya.D.N, HSST Chemistry, Janatha HSS, Thempamoodu (01053)
2. Hena Sadhudas, HSST Chemistry , Janatha HSS, Thempamoodu (01053)
3. Indulekha.KS, HSST Chemistry, GHSS Bharathannoor (01032)
4. Sabeena.ME, HSST Chemistry , GHSS Bharathannoor (01032)
5. Shahinabeegam, HSST Chemistry, Iqbal HSS Peringamala (01067)
6. Sindhu.K.Nair, HSST Chemistry, Iqbal HSS Peringamala (01067)
7. Manju, HSST Chemistry, GHSS Thattathumala (01150)
8. Indu.S, HSST Chemistry, NSS HSS Madavoor (01174)