



MITHILA INSTITUTE OF TECHNOLOGY

Bishara Chowk, Janakpurdham - 4

Science Faculty

End Sem Exam 2021

Class : XII

F.M.: 75

Time : 3 hrs.

Chemistry

P.M.: 27

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Group 'A'

Choose the correct option and write it.

[1x11=11]

- The iodide salt consists of 50 ppm iodine in 1 kg packet. The amount of iodine in 1 kg packet salt is
a) 50 mg b) 30 mg c) 40 mg d) 32 mg
- Which of the following is not a primary standard substances?
a) Hydrated oxalic acid b) Anhydrous Na_2CO_3
c) Mohr's salt d) KMnO_4
- Standard cell potential (E°) for Daniell cell is
a) -1.1 V b) $+1.1 \text{ V}$ c) -0.46 V d) $+0.46 \text{ V}$
- Radioactive decay is
a) zero order b) second order c) first order d) third order
- Half period of first order reaction is 3 minutes. The time required to complete 87.5% of the reaction is
a) 9 min b) 12 min c) 13 min d) 15 min
- Most reactive alkyl halide towards SN^1 reaction is
a) n-butyl chloride b) sec-butyl chloride
c) tert-butyl chloride d) allyl chloride
- Ulmann reaction produces
a) phenol b) nitrobenzene
c) iodobenzene d) chlorobenzene
- The reactivity of alcohol with Lucas reagent follows the order
a) $1^\circ > 2^\circ > 3^\circ$ b) $2^\circ > 1^\circ > 3^\circ$
c) $3^\circ > 2^\circ > 1^\circ$ d) $1^\circ > 3^\circ > 2^\circ$
- Chlorobenzene is commercially prepared by
a) Sandmeyer reaction b) Finkelstein reaction
c) Raschig process d) Dows process
- Which of the following is the least reactive in electrophilic aromatic substitution?
a) phenol b) benzene
c) chlorobenzene d) nitrobenzene
- Phenol and carboxylic acid can be distinguished by
a) Na b) blue litmus paper c) NaHCO_3 d) NaOH

Group 'B'

Short answer questions.

[5x8=40]

- 12.a) 2 g of calcium was burnt in excess of oxygen to get CaO. CaO so formed was dissolved in water and the solution was made upto 500 mL. Calculate the normality of alkaline solution. [2.5]
- b) A partially hydrated sodium carbonate ($Na_2CO_3 \cdot H_2O$) weighing 0.31 g is added to 100 mL of 0.05 N H_2SO_4 solution. Will the resulting solution be neutral, acidic or basic? [2.5]
- 13.a) Show your acquaintance with collision theory of reaction. [3]
- b) The following data were obtained at 300 K for the reaction $2A + B \rightarrow C + D$.

Expt	[A] (mol L ⁻¹)	[B] (mol L ⁻¹)	Rate of formation of D (mol L ⁻¹ min ⁻¹)
1	0.1	0.1	5×10^{-3}
2	0.3	0.2	6×10^{-2}
3	0.3	0.4	2.4×10^{-1}
4	0.4	0.1	2×10^{-2}

Calculate

- a) the order with respect to A & B
- b) rate constant for the reaction
- c) rate of formation of D when $[A]=0.5 \text{ mol L}^{-1}$ and $[B]=0.2 \text{ mol L}^{-1}$ [2]

Or,

- a) Derive the equation $x = K_0 t$ for zero order reaction.
- b) Define homogenous and heterogeneous catalysis with example.
- c) Mention any four characteristics of catalyst. [2+1.5+1.5]

- 14.a) Discuss the origin of single electrode potential. [3]
- b) Using standard electrode potentials predict the reaction if any, that occurs between $Fe^{3+}(aq)$ and $I^{-}(aq)$? [2]

$$E^0_{Fe^{3+}/Fe^{2+}} = 0.77 V, E^0_{I_2/2I^{-}} = 0.54 V$$

- 15.a) Define the terms [2]
- i) molarity ii) mole fraction iii) formality iv) titration
- b) Calculate the equivalent mass of potassium dichromate in acidic medium. [1.5]
- c) Differentiate between primary standard and secondary standard substances. [1.5]

- 16.a) What are ethers? Classify them.
- b) Anisole cannot be prepared by treating bromobenzene with sodium methoxide. Why?
- c) Write any three examples of cyclic ethers. [2+2+1]
- 17.a) Write the IUPAC name of glutaric acid.
- b) Convert methyl cyanide to acetic acid.
- c) Convert malonic acid to acetic acid.

- d) Write the reaction involved for preparation of acetic acid from sodium methoxide. [1+1+1+1+1]
 e) Convert ethanoic acid to calcium ethanoate.

Or,

- a) Why carboxylic acids do not give properties of aldehydes and ketones?
 b) Chloroacetic acid is stronger acid than acetic acid. Why?
 c) What happens when Tollen's reagent is warmed with formic acid?
 d) Show your acquaintance with Hell-Volhard-Zelinsky reaction. [1+1+1+2]
 18. a) How does nitro group differ from nitrite group?
 b) Electrophilic substitution is easier in benzene than in nitrobenzene. Why?
 c) What happens when
 i) nitrobenzene is reduced under neutral medium
 ii) iodoethane is warmed with alcoholic AgNO_3 . [1.5+1.5+2]

19. Convert

- a) chloroform to acetaldehyde
 b) 1-Chloropropane to 2-chloropropane
 c) chloroethane to ethyne
 d) aniline to iodobenzene
 e) bromobenzene to benzonitrile [1+1+1+1+1]

Group 'C'

[8×3=24]

Long answer questions.

20. a) Define activation energy of reaction.
 b) Why can't the molecularity of a reaction be equal to zero?
 c) Differentiate between order and molecularity of reaction.
 d) How do a log of wood burn slower than pieces of wood?
 e) Rate of reaction is given by the equation, $\text{rate} = K[A]^2[B]^1$.
 What are the units of rate and rate constant for the reaction?
 f) What will be the effect of temperature on rate constant? [1+1+2+1+2+1]

Or,

- a) The half life period of first order reaction is x and time taken for completion of three-fourth of same reaction is y . How are x and y related to each other?
 b) Why does rate of reaction not remain constant throughout the reaction process?
 c) For the reaction $A \rightarrow B$, the rate of reaction becomes 27 times, when concentration of A is increased three times. What is the unit of rate constant for the reaction? [3+2+2+1]
 d) State any one condition under which a bimolecular reaction may be kinetically first order.

21. a) Distinguish 1° , 2° & 3° alcohol by Victor - Meyer method.

- b) Compound $P(C_5H_{12}O)$ reacts with sodium to give hydrogen gas. P on treatment with conc. H_2SO_4 gives $Q(C_5H_{10})$ which on ozonolysis yields acetone and acetaldehyde. Identify P and Q giving concerned reaction.

- c) Define
i) power alcohol ii) fermentation [3+3+2]
- 22.a) Convert aniline to benzylamine.
- b) What happens when chlorobenzene is sulphonated?
- c) Haloalkanes are less reactive towards nucleophilic substitution reaction. Give reason.
- d) Why is chloroform not used as an anesthetic these days?
- e) Write IUPAC name of allyl bromide. [2+1+3+1+1]

Best of Luck !!!



Jaya Multiple Campus

Under Jaya Memorial Education Foundation

Gokarneshwor-08, Makalbari, Kathmandu

First Terminal Examination-2081

Sub.: Chemistry

Level: XII (SCI)

Time: 3 Hours

Full Marks: 75

Pass Marks: 30

Group 'A'

Circle the best alternative to the following questions. (11×1=11)

1. The equivalent weight of KMnO_4 in alkaline medium having molecular weight M is
A. $M/2$ B. $M/3$ C. $M/5$ ☒ D. M
2. In the titration between strong acid and weak base, indicator used is
☒ A. Methyl orange B. Phenolphthalein C. Litmus D. None
3. Normality of 1M H_2SO_4 solution is
A. 0.1N ☒ B. 0.2N C. 0.05 D. 0.001
4. What weight of zinc carbonate can just neutralize 300 cc of 0.1N H_2SO_4 ?
A. 1.875 g B. 1.275 g ☒ C. 0.875 D. 2.5g
5. The unit of rate constant for first order reaction is
☒ A. s^{-1} ☒ B. $\text{mol L}^{-1} \text{s}^{-1}$ C. mol s^{-1} D. $\text{L mol}^{-1} \text{s}^{-1}$
6. When two molecules of formaldehyde react in the presence of base to produce CH_3OH and HCOONa the reaction is known as,
☒ A. aldol condensation B. Claisen condensation
C. Wurtz reaction ☒ D. Cannizzaro's reaction
7. Which of the following ore is called Malachite
A. CuCO_3 B. Cu_2S C. Cu_2O ☒ D. $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$
8. When chloroform reacts with conc. HNO_3 , product obtained is:
A. Ethylidene chloride B. Nitrogen
☒ C. Chloropicrin D. Nitromethane
9. SN^1 reaction of alkyl halide leads to
A. Retention of Configuration ☒ B. Racemization
C. Inversion of Configuration D. None
10. In the conversion of Chlorobenzene into Benzene, the reducing agent is
(a) Raney Ni (b) Mg and isopropanol
☒ (c) Ni-Al alloy and NaOH (d) H_2/Ni

- ii) Name any two instruments to check the quality of cement. [1+1]
- b) Write the monomers of Nylon-6,6 and Bakelite. [2]
- c) What are antipyretic drugs ? Give the name and structure of an antipyretic drug. [2]
- d) Draw flow sheet diagram for manufacture of paper. [2]

BEST WISHES

Attempt all the questions

(8×5=40)

12. Define acidity. 0.70 g of $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$ dissolved in water and volume was made 100 ml. 20 ml of this solution required 19.6 ml of decinormal solution of HCl for complete neutralization. Calculate the value of x. (1+4)

OR

Define normality. Derive the relation between normality and molarity. Calculate the normality of 99% pure sulphuric acid (sp. gravity 1.86 g/ml). (1+2+2)

13. Anhydrous sodium carbonate is primary standard substance.
a) Why is it called so?
b) How can you prepare 250 mL decinormal solution of it in laboratory?
c) Is it necessary to mention normality factor while preparing standard solution?
d) Mention any one use of this solution in analytical chemistry. (1+2+1+1)
14. Titration is volumetric operation which involves determination of concentration of solution.
a) Define redox titration.
b) What do you mean by self indicator?
c) Name the apparatus used during titration.
d) Why is mouth pipetting of oxalic acid solution harmful?
e) Mention some safety measures and precautions during titration. (1+1+1+1+1)
15. Acidic strength of solution can be measured in terms of pH value.
i) Define pH of solution.
ii) What is application of pH in our daily life?
iii) If equal volume of two solutions having pH=1 and pH=2 are mixed together. What will be the pH of solution? (1+1+3)
16. Ionic product of water at 25 °C is 1×10^{-14} and water is regarded as very weak electrolyte.
a) Define the ionic product of water.
b) Deduce the relation $K_w = [\text{H}^+][\text{OH}^-]$
c) Calculate $[\text{OH}^-]$ in 0.01 M HCl at 25 °C.

d) What is the effect of temperature on ionic product of water?
(1+1+2+1)

OR

What is crystal field splitting energy? On the basis of CFT , write electronic configuration of d^4 in terms of t_{2g} and e_g in an octahedral field when

$$a) \Delta_0 > P \qquad b) \Delta_0 < P \qquad (2+3)$$

17. There are various concepts of acid and bases

a) Give your understanding with Bronsted-Lowery concept of acid and base. .

b) Water acts as Bronsted-Lowery acid and base. Justify.

c) Write conjugate acid and base of NH_3 . (2+2+1)

18. Alkyl halides are halogen derivatives of alkanes.

a) Classify monohaloalkanes.

b) What products would you expect from Wurtz reaction using 2-chloropropane?

c) BHC is an insecticide, how can you prepare it?

d) Differentiate between SN^1 and SN^2 reaction.

e) Is carbon tetrachloride polar or nonpolar compound?

(1+1+1+1)

OR

Write any three important characteristics of transition metals. Cu^+ is transition metal ion but can't give colour, why? (3+2)

19. Mention any three general methods of preparation of haloalkanes. Convert 2-bromopropane into 1-bromopropane. (3+2)

Group C

Attempt all the questions

(3×8=24)

20. State and explain Ostwald's dilution law. Why is it not applicable for strong electrolyte? Calculate degree of ionization of acetic acid, concentration of ions and unionized acetic acid present in 0.1M acetic acid solution at 25 °C. (Given $K_a = 1.8 \times 10^{-5}$) (3+2+3)

OR

Starting from copper, how would you obtain blue vitriol? Write important uses of red oxide and blue oxide. Explain corrosion of iron and its prevention. black (2+2+4)

 $(2+2+4)$

21. Define the term
- a) Titrant
 - b) Equivalence point
 - c) End Point
 - d) Titration error

1 g of divalent metal was dissolved in 25 ml of 1M sulphuric acid. The unreacted acid further required 15 ml of 1N ($f=0.80$) NaOH for complete neutralization. Calculate gram equivalent of unreacted acid and atomic weight of metal. (4+4)

OR

Define normal solution and derive normality equation. Will one mole of a substance always react with one mole of another substance completely? What volume of 12 M NaOH and 2M NaOH should be mixed to get 2 litre of 9M NaOH solution? (1+2+1+4)

22. An unsaturated hydrocarbon (C_3H_6) undergoes Markovnikov's rule to give (A). Compound (A) is hydrolyzed with alkali to yield (B). When (B) is treated with PBr_3 , compound (C) is produced. (c) reacts with $AgCN$ (alc.) to give another compound (D). The compound (D) if reduced with $LiAlH_4$, produce (E).
- i) Define Markovnikov's rule.
 - ii) Identify A, B, C, D. E with chemical reaction.
 - iii) How does E react with nitrous acid?
 - iv) How would you convert B into C_3H_8 ? (1+5+1+1)

OR

Give reaction involved in the preparation of chloroform from ethanol and propanone. Small amount of ethanol is added in the chloroform during storage, why? Starting from chloroform how would you prepare

- a) ethyne
- b) methane
- c) chloropicrin
- d) chloretone
- e) potassium formate? (2+1+1+1+1+1+1)

Koshi Saint James Secondary School

Itahari- 9, Sunsari

First Term Exam 2081

Time: - 1:30 Hrs.

Class: - XII

Sub: -Chemistry

F.M.: - 37.5

P.M.: - 14

Candidates are required to give their answer in their own words as far as practicable. The figures in margin indicate full marks.

Group 'A'

Attempt all the questions:

[5x1=5]

Select best option for the given questions.

1. The enzyme that convert glucose into ethanol is
a. Diastase b. Invertase c. Maltase d. Zymase
2. The order of reactivity of alkyl halides toward SN^2 reaction is;
a. $1^0 > 2^0 > 3^0$ b. $2^0 > 1^0 > 3^0$
c. $3^0 > 2^0 > 1^0$ d. $3^0 > 1^0 > 2^0$
3. The total no of unpaired electron present in $[CoF_6]^{3-}$ is ____
a. 0 b. 2 c. 3 d. 4
4. Equivalent wt. of an acid is equal to
a. Molecular wt. /acidity b. Molecular wt. /basicity
c. Molecular wt. $\times$ acidity d. Molecular wt. $\times$ basicity
5. When normal egg is boiled, entropy
a. Increases b. Decreases c. Becomes zero d. None

Group 'B'

Short questions:

[5x5=25]

6. Alcohols are distilled and undistilled category used in beverages.
a. Define power alcohol and rectified spirit. [1]
b. Show how 1^0 , 2^0 and 3^0 alcohols can be distinguished by Victor-Meyer's method? [4]
7. Write an example of each following reactions: [1x5=5]
a. Wurtz-fittig reaction b. Reimer-Tiemann reaction
c. Carbylamine reaction d. Gattermann reaction
e. Oxo process
8. An important compound non-typical transition metal zinc which is used as eye lotion and is also called white vitriol. [5x1=5]
a. Write down a method of preparation of white vitriol.
b. What happens when white vitriol is heated?
c. How is lithopone obtained from white vitriol?
d. Give a chemical reaction showing formation of double salt.
e. Why is zinc considered as a non-typical transition metal?

OR

Steel is manufactured by open Hearth's process.

[1+2+1+1]

- What is open Hearth's process?
 - Write down the chemical reactions occurring in open Hearth's furnace.
 - Why is spiegeleisen added in the Open- Hearth's furnace?
 - Give one advantage of this process.
9. Volumetric analysis is the expression of different concentration in various ways.

- What do you mean by Primary standard substance? [1+1+3]
- Write any one criteria and example for primary standard substance.
- What volume of the 2N HCl is required to neutralize 1 liter of 0.6N NaOH solution?

10. Entropy, enthalpy and Gibb's free energy are thermodynamic parameters.

- Define enthalpy of combustion and formation. [1]
- Calculate the formation of ethanoic acid if the enthalpy of combustion of carbon, hydrogen and ethanoic acids are -393.7, -286 and -333.5 kJ/mol respectively. [4]

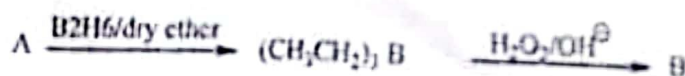
Group 'C'

Long questions:

[1x7.5=7.5]

11. A common laboratory reagent 'X' is chlorine containing compound used as organic solvent and stored in dark brown bottle to prevent formation of poisonous gas.

- What is 'X'? Write its IUPAC name. [1]
- How is this compound prepared using acetone? [1.5]
- What is the action of compound 'X' with;
i) Exposed air ii) Conc. HNO_3 (iii) acetone [1x2=3]
- Identify A and B. [2]



OR

The driving force for spontaneity of process is tendency of a system to acquire a state of minimum energy and a state of maximum randomness.

- What are spontaneous and non-spontaneous processes? Give example of each. [1+1]
- Define 1 entropy unit. [1]
- What is molar entropy change? State the effect of increased temperature on entropy of substance. [1+1]
- What are the thermodynamic parameters to get the spontaneous process? [2]
- At what temperature the entropy of the perfectly crystalline substance is zero? [0.5]



**NASA
COLLEGE**

Gairigaun, Tinkune Kathmandu

FIRST TERMINAL EXAMINATION-2081

Subject: Chemistry

Grade :XII

Time: 3:00hrs

FM: 75

PM: 27

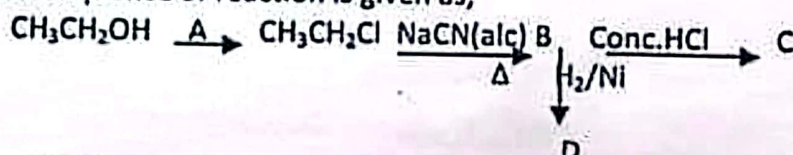
Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Group B

Attempt all questions

[8x5=40]

12. Molarity and normality are the ways of expressing concentration of solution.
 - i. Deduce the relationship between normality and molarity. [2]
 - ii. Calculate the resulting normality of a solution prepared by mixing 20 mL of 0.8 M NaOH with 25 mL of 0.4 M H_2SO_4 solution. [3]
13. i. Define the terms a. Electrolyte b. potential electrolyte [2]
- ii. Derive the mathematical expression for Ostwald's dilution law. [3]
14. i. How is a strong electrolyte differ from a weak electrolyte ? [2]
- ii. The dissociation constant of acetic acid is 1.6×10^{-5} . Find the degree of dissociation of 0.01 M CH_3COOH acid in presence of 0.1 M HCl solution. [3]
15. Explain the extraction of blister copper from Copper pyrites. [5]
16. i. Account for the fact that
 - a. Transition metals show variable oxidation states. [1]
 - b. Transition metals have catalytic activity. [2]
- ii. Draw a well labelled diagram of splitting of d-orbitals by CFT of the Complex ion $[Fe(H_2O)_6]^{2+}$ for colour formation. [2]
17. i. Show your acquaintances with
 - a. Williamson's ethereal synthesis [2]
 - b. Carbylamine reaction [1]
- ii. A sequence of reaction is given as,



- Identify A, B, C and D with their chemical names. [2]
18. i. Convert 1- Bromopropane into 2- Bromopropane and vice-versa [3]
- ii. Write the possible isomers of the molecular formula C_4H_9I and compare their boiling points. [2]
19. i. How is Portland cement made? [2]
- ii. What are the grades of ordinary cement ? Which one is better for construction work? [2]
- iii. Write a reaction which occurs in OPC cement. [2]
- Or
- i. Write the tautomerism in the molecular formula $C_2H_5NO_2$ [2]
- ii. Show that nitro group as an ambident functional group. [2]
- iii. How will you convert nitroethane into N-ethyl hydroxylamine? [1]

Group C

Attempt all questions

[8x3=24]

20. Equivalence point and end points are the common terms used in titration.

- i. Distinguish between end point and equivalence point. [2]
- ii. What is meant by titration error and how can it be minimized? [2]
- iii. Conc. nitric acid is used as a laboratory reagent contains 69% by mass of nitric acid. The density of the nitric acid is 1.41 g cm^{-3} . Calculate volume and normality of the Solution containing 23 g of nitric acid. [4]

Or

Strength of sulphuric solution can be determined by titration with primary standard Sodium carbonate solution.

- i. Na_2CO_3 is used as a primary standard solution. Why? [2]
 - ii. Which chemical indicator is suitable for this titration and why? [2]
 - iii. 1 g of a divalent metal was dissolved in 25 mL of 2N H_2SO_4 ($f=1.01$). The excess acid required 15.1 mL of 1N NaOH ($f=0.8$) for complete neutralization. Find atomic weight of the metal. [4]
21. An organic compound (A) on heating with Ag powder, C_2H_2 is formed and on exposure to sunlight phosgene gas is formed.
- i. Identify the compound A for above chemical reactions. [2]
 - ii. Write the principles involved in the lab. Preparation of compound A from ethanol. [3]
 - iii. How does compound A reacts with Conc. HNO_3 ? [1]
 - iv. Convert A into formic acid. [2]
22. i. How is Grignard's reagent prepared? What happens when methyl magnesium Bromide is treated with CO_2 followed by hydrolysis? [2+2]
- ii. How does chloroethane reacts with Li/dry ether? [1]
 - iii. Convert 2-iodopropane into 2,3-dimethylbutane. [2]
 - iv. What product do you expect when Methyl isocyanide is reduced with LiAlH_4 ? [1]

Best of Luck

Sukuna Secondary School.

(Sundarharaicha-10, Morang)

First Terminal Examination-2081

Class-XII(Science)

F.M.- 37.5

Sub- Chemistry

Time-1.5 Hrs

Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks.

Attempt all the questions

Group-A

1x5=5

Rewrite the correct options of each questions in your answer sheet.

1. Functional isomer of methoxyethane is

a. Propanal

b. Propanone

c. Propanoic acid

d. Propanol

2. The unit of rate constant for first order reaction is

a. $\text{mol L}^{-1}\text{s}^{-1}$

b. $\text{L mol}^{-1}\text{s}^{-1}$

c. s^{-1}

d. $\text{L s}^{-1}\text{mol}^{-1}$

3. The best reagent for the preparation of pure ethyl chloride from ethanol is

a. PCl_2

b. PCl_5

c. SOCl_2

d. Lucas reagent

4. Alcohol vapour can be dehydrated by passing over heated

a. Al_2O_3

b. CaO

c. CaCl_2

d. Ca(OH)_2

5. Mixture of methyl magnesium bromide and carbon dioxide gives

a. CH_3CHO

b. HCOOH

c. HCHO

d. CH_3COOH

Group 'B'

Short answer questions.

[5 x 5 = 25]

1. Chlorinated compound 'A' which react with conc HNO_3 to give tear gas.

a. Identify 'A' and how can you prepare 'A' by using one of the isomer of $\text{C}_2\text{H}_5\text{O}$?

[2]

b. Why is small amount of ethenol added to a bottle containing 'A'.

[2]

c. What happen when 'A' is treated with acetone in presence of aqueous KOH ?

[11]

2. Ethanol is an excellent antiseptic and antimicrobial which can be used as sanitizers and medical wipes.

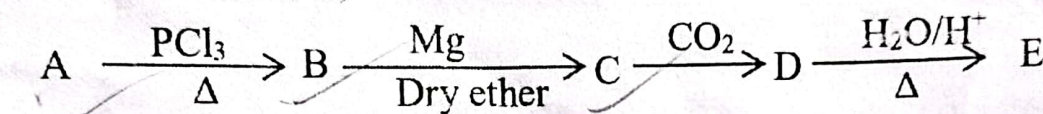
a. Write the chemical reaction for the formation of ethanol by fermentation process. [2]

b. What is absolute alcohol? It is also called anhydrous alcohol. Why? [1]

c. Convert propane-1-ol to propane-2-ol and vice versa. [2]

3. a. What do you mean by unsymmetrical ether? Write an example and IUPAC name. [2]

b. Consider a reaction, [3]



The compound 'A' is a primary alcohol which on oxidation gives ethanal. Identify A, B, C, D and E.

4. A carbonyl compound 'A' gives both tollens' and iodoform test.

a. Identify the compound 'A' with its IUPAC name. [1]

b. How does the compound 'A' react with dil. NaOH? Write involved chemical equation. Write the name of the reaction. [2]

c. How can you prepare 'A' by Rosenmund's reduction? [1]

d. How can you obtain 'A' by oxidation of ethanol? [1]

5. Write an example of each of the following.

a. 2,4-DNP test

b. Williamson's Synthesis

c. Perkin condensation

d. Dehydration of alcohol

e. Wurtz-Fittig reaction

OR

a. What happens when,

i. Secondary propyl alcohol is heated with copper at 300°C

ii. Condensation of benzaldehyde in presence of alcoholic KCN.

b. Give reason,

i. Chloroform cannot give white ppt with AgNO₃ solution.

ii. It is dangerous to boil sample of ether stored for a long time.

iii. Alcohol is weaker acid than water.

Group 'C'

Long answer questions.

[1 x 7.5 = 7.5]

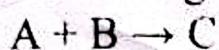
6. a. Define rate reaction. Write its unit.

[1.5]

b. Differentiate between order and molecularity of a reaction.

[2]

c. The following experimental data were obtained for the reaction



[4]

Expt No	[A] mol L ⁻¹	[B] mol L ⁻¹	Initial rate mol L ⁻¹ s ⁻¹
1	0.20	0.20	<u>3x10⁻³</u>
2	0.40	0.20	1.2x10 ⁻²
3	0.20	0.40	<u>6x10⁻³</u>
4	0.60	0.20	9x10 ⁻³

i. Write the order of reaction w.r.t. A and B and overall order of reaction

ii. Write rate law equation.

iii. Calculate the value of k.

iv. Calculate the rate of formation of C when [A] = 0.2 mol l⁻¹ and [B] = 0.4 mol l⁻¹.

Best of luck



Sukuna Secondary School

Sundarhaicha-10, Morang

Monthly Test-2081

Class-XII(Science)

Sub- Chemistry

Time-1Hrs

Full Marks-25

Group-A

Rewrite the correct options of each questions in your answer sheet. [1x5=5]

1. SN1 reaction occurs through the formation of:
a. carboanion
b. Carbocation
c. Free radical
c. Both a and b
2. Which of the following alcohol is least soluble in water?
a. $\text{CH}_3\text{-OH}$
b. $\text{C}_3\text{H}_7\text{-OH}$
c. $\text{C}_5\text{H}_{11}\text{-OH}$
d. $\text{C}_8\text{H}_{17}\text{-OH}$
3. Sodium phenoxide reacts with methyl iodide to give:
a. Anisole
b. Cresol
c. Toluene
d. Aniline
4. Which of the following gives iodoform test?
a. $\text{CH}_3\text{-OH}$
b. HCHO
c. $\text{CH}_3\text{COCH}_2\text{-CH}_3$
d. CH_3COOH
5. Formalin is
a. 40% of acetone
b. 40% of formaldehyde
c. 5% of formaldehyde
d. 40% of acetaldehyde

Group-B

Short question answer.(any four)

[4x5=20]

1. Propane on chlorination gives two isomeric chloropropane in which one is major product(X) and another is minor product(Y).
a. What are X and Y? [1]
b. What will be the product if X and Y separately heated with alcoholic KOH? [2]
c. What product is formed when X is heated with Na-metal in dry ether? [1]
d. What product would you obtained when Y is treated with aq. KOH? [1]
2. An alcohol (P) having molecular formula $\text{C}_3\text{H}_8\text{O}$ undergo victor-Meyer test to give blue colour at the end of the reaction when you added KOH solution.

- a. Draw the structural formula and write IUPAC name of (P). [2]
- b. Write complete chemical reaction for the Victor-Meyer test for (P). [2]
- c. How would you obtain (P), starting from CH_3MgBr ? [2]

3. Write an example of each of the following. [1x5=5]

- a. Dehydrohalogenation reaction
 - b. Oxo-process
 - c. Williamson synthesis
 - d. Aldol condensation
 - e. Cannizzaro's reaction
4. An organic compound having molecular formula $\text{C}_3\text{H}_6\text{O}$ has two carbonyl isomers A and B in which A gives iodoform test but not B.

- a. Identify A and B with their IUPAC name. [2]
- b. write a reaction of B with $\text{K}_2\text{Cr}_2\text{O}_7/\text{H}^+$ [1]
- c. How can you prepare Chloroform from A? [2]

5. a. Identify A and B from the following reaction with their IUPAC name. [2]



- b. Ether is stored in a bottle containing iron wire Why? [2]
- c. How can you prepare diethyl ether from ethanol?

The End
Note Mandir

NEB-GRADE XII

2081 (2024)

Chemistry

(New course)

(For general stream students whose first two digits of registration number start from 78, 79 and 80)

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Attempt all the questions.

Group 'A'

[11×1=11]

Rewrite the correct option of each question in your answer sheet.

- What is the molarity of 0.4 N Na_2CO_3 solution?
 A) 0.1 M B) 0.2 M C) 0.4 M D) 0.8 M
- Which of the following will have highest pH in water solution ?
 A) NaCl B) Na_2CO_3 C) KCl D) CuSO_4
- What kind of battery is used in a laptop computer and mobile phone ?
A) Li-ion battery B) Dry cell battery
 C) Fuel cell battery D) Simple cell battery
- What is the enthalpy change in the reaction, $2\text{CO} + \text{O}_2 \rightarrow 2\text{CO}_2$ called?
A) Enthalpy of combustion B) Enthalpy of formation
 C) Enthalpy of fusion D) Enthalpy of reaction
- Which one of the following complex ions gives tetrahedral geometry ?
A) $[\text{Ni}(\text{CN})_4]^{2-}$ B) $[\text{NiCl}_4]^{2-}$ C) $[\text{PtCl}_4]^{2-}$ D) $[\text{CoF}_6]^{3-}$
- Which of the following molecules does not act as a ligand ?
 A) CO_2 B) NH_3 C) H_2O D) CO
- Which of the following is used to convert $>\text{C}=\text{O}$ group to $-\text{CH}_2-$?
 A) $\text{Ni}/\text{H}_2/\Delta$ B) LiAlH_4/Δ
C) $\text{Zn-Hg}/\text{HCl}/\Delta$ D) $\text{Pd}/\text{H}_2/\Delta$

Contd...

8. Benzoic acid gives benzene on being heated with 'X' and phenol gives benzene on being heated with 'Y'. Therefore, X and Y are respectively:
A) Sodalime and copper B) Zn dust and NaOH
C) Zn dust and sodalime D) Sodalime and Zn dust
9. $CH_3Cl \xrightarrow{Alc. AgCN} (A) \xrightarrow[\Delta]{LiAlH_4} (B)$, what would be the product B ?
A) Methanamine B) Ethanamine
C) N - methyl methanamine D) N-methyl ethanamine
10. When the compound sodium ethoxide reacts with chloroethane, it gives the compound $C_4H_{10}O$. What reaction is this ?
A) Wurtz's reaction B) Williamson's synthesis
C) Rosenmund's reduction D) Dehydrohalogenation reaction
11. What would be the product when ketone is treated with Grignard's reagent?
A) Primary alcohol B) Secondary alcohol
C) Tertiary alcohol D) Methyl alcohol

NEB-GRADE XII

2081 (2024)

Chemistry

(New course)

(For the regular and grade increment general stream's students whose first two digits of registration number starts from 78 , 79 and 80)

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Time: 3 hrs.

Full Marks: 75

Attempt all the questions.

Group 'A'

Question No. 1 to 11 (Multiple Choice Questions) will be provided after 30 minutes of starting examination. Rewrite its (MCQ) correct options (answer) in the same answer sheet.

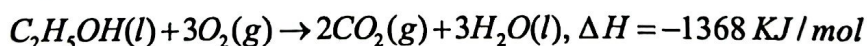
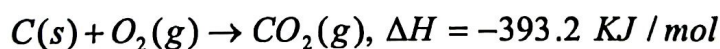
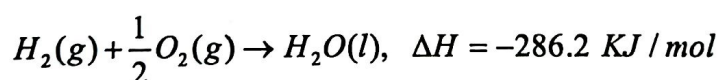
Group 'B'

[8×5=40]

12. An electrochemical cell (galvanic cell) is designed by coupling Zn-electrode with standard hydrogen electrode (SHE). Given, $E_{Zn^{++}/Zn} = -0.76\text{ V}$.
- Draw the galvanic cell. [2]
 - Write down complete cell reaction. [2]
 - Calculate the emf of the cell. [1]

Or

What is Hess's law of constant heat summation ? Calculate the heat of formation of ethanol from the following data : [1+4]



- 13.** Define the following terms.
 i) Lewis base
 ii) Basic buffer [2]
/ Calculate the pH of solution obtained by mixing equal volumes of two solutions having $pH = 3$ and $pH = 5$. [3]
- 14.** A heavy metal is extracted from its oxide ore. During extraction, smelting of the calcined ore is done in a blast furnace.
 a) Name the metal and the ore.
 b) Draw the clean and labelled diagram of the blast furnace showing different zones.
 c) Write down the balanced chemical equations of slag formation reactions.

Contd...

[1+3+1]

15. Write two methods of preparation of corrosive sublimate. Give its action with a) excess of KI b) NH_3 [2+2+1]

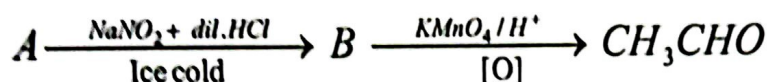
16. i) Starting from nitrobenzene, how would you prepare aniline? Convert aniline into:

a) phenyl isocyanide b) azo-dye [1+2]

ii) Nitrobenzene prefers electrophilic substitution reaction at meta-position.

Explain. [2]

17. A sequence of chemical reactions is represented as:



a) Identify the compounds (A) and (B). [1]

b) Write the laboratory test of compound (B). [1]

c) Starting from compound (B), how would you obtain nitrolic acid? [2]

d) Predict the product when compound (A) is heated with chloroform in alcoholic medium. [1]

Or

Make a correct sequence of reactions using suitable conditions and reagents of the following compounds.

Benzene, Benzaldehyde, Toluene, Cinnamic acid, Sodium benzoate, Benzoic acid.

18. Write a chemical equation for each of the following.

a) 2, 4- DNP test [1]

b) Oxo-process [1]

c) Claisen condensation reaction [1]

d) Wurtz-Fittig reaction [1]

e) Carboxylation reaction [1]

19. The chlorinated compound 'A' reacts with acetone to give sleep-inducing drug.

a) How would you prepare compound 'A' by using one of the isomers of $\text{C}_2\text{H}_6\text{O}$? [2]

b) What happens when compound 'A' is:

i) Exposed in air? [1]

ii) Heated with phenol in the presence of aq. NaOH? [2]

Group 'C' [3×8=24]

20. a) Distinguish between pseudo first order and first order reaction giving an example of each. [2]

Contd...

(3)

3021 'P'

- b) Draw an energy profile diagram showing energy of activation for endothermic reaction. [2]
- c) The hypothetical data for the reaction, $2A + B \rightarrow C$, are,

Expt No.	[A] molL ⁻¹	[B] molL ⁻¹	[rate] formation of [C] molL ⁻¹ Sec ⁻¹
1	0.1	0.1	6×10^{-3}
2	0.3	0.2	7.2×10^{-2}
3	0.3	0.4	2.88×10^{-1}
4	0.4	0.1	2.40×10^{-2}

Calculate the rate of formation of 'C' when the concentration of 'A' and 'B' are $[0.6] \text{ molL}^{-1}$ and $(0.3) \text{ molL}^{-1}$, respectively. [1+1+1+1]

Or

- a) Deduce normality equation. [2]
- b) Give reason.
- Methyl orange is used as indicator for the titration between H_2SO_4 and Na_2CO_3 . [1]
 - Oxalic acid solution is warmed by adding *dil.* H_2SO_4 before titration with KMnO_4 . [1]
 - 0.70 g of a sample of $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$ was dissolved in water and volume was made 100 ml. 20 ml of this solution required 19.8 ml of $\frac{N}{10}$ HCl for complete neutralization. Find the value of x. [4]
21. a) Give any two chemical reactions for the preparation of ethanoic acid. [2]
- b) How does ethanoic acid react with [2]
- P_2O_5
 - NH_3 ?
- c) A carbonyl compound 'A' gives both Tollen's and iodoform tests positively.
- Identify the compound 'A'. [1]
 - How does the compound 'A' react with dil. NaOH? Give chemical equation involved. [1]
 - Write the chemical equation when compound 'A' reacts with HCN followed by hydrolysis. [2]

Contd...

3021'P'

(4)

Or

a) An aromatic compound (A) undergoes Sandmeyer's reaction to give (B). The compound (B) is reduced with Ni-Al in presence of alkali to give compound (C). The compound (C) further reacts with CH_3Cl in the presence of Anhydrous AlCl_3 . The compound (B) when heated with chloral in acidic medium gives a common insecticide. Identify (A), (B), (C) and (D) giving complete reaction. [4]

b) How do you separate the isomers of $\text{C}_3\text{H}_9\text{N}$ by Hoffmann's method? Explain with suitable chemical equations. [4]

22. a) Define homopolymer and co-polymer. [2]

b) Differentiate between paper and pulp. [2]

c) Distinguish between OPC and PPC cement. [2]

d) Write down any two uses of radioisotopes in medical field. [2]