

NEB - GRADE XII

2076 (2019)

Chemistry

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

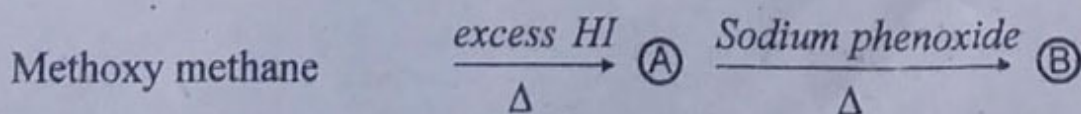
Pass marks: 27 (Only for partial students)

Group 'A'

Attempt any **fifteen** questions.

15x2=30

1. C in C_2H_2 gets SP hybridization, why? 2
2. Distinguish between titration error and normality factor. 2
3. Write the conjugate acid and base of NH_3 . 1+1
4. How many coulombs are required to produce 1+1
 - i) 80gm of calcium from molten $CaCl_2$?
 - ii) 50gm of Aluminum from molten Al_2O_3 ?
5. State the first law of thermodynamics. 2
6. Calculate entropy change (ΔS) and free energy change (ΔG) for the conversion of ice into water at equilibrium when enthalpy change (ΔH) is $9KJ/mol$. 2
7. You are given a rate law equation $Rate = K [A]^2 [B]$. By how many times will the rate increase or decrease for the reaction if 1+1
 - i) concentration of (A) is doubled while that of (B) remain constant.
 - ii) Concentration of (A) is kept constant that of (B) is doubled?
8. How is sodiumbenzoate converted into acetophenone? 2
9. Explain, why is chlorobenzene less reactive than benzene in electrophilic substitution reaction? 2
10. What product would you obtain when phenol is treated with 1+1
 - i) Benzene diazonium chloride?
 - ii) Phthalic anhydride?
11. Identify the major products (A) and (B) giving their IUPAC names in the given reaction sequence. 1+1



12. An organic Compound C_3H_6O does not give silver mirror with tollen's reagent but gives yellow precipitation with $NaOH$ and I_2 . Identify the compound and write the reactions involved. 2
13. Why is nitro group called an ambident group? 2.
14. What happens when aniline is
 i) treated with benzene diazonium chloride. 1+1
 ii) heated with chloroform in presence of *alc. KOH*. 1+1
15. Write down the functional isomer of methyl methanoate, what product would you expect when the isomer is heated with P_2O_5 ? 1+1
16. What are lipids? Name the products formed when simple lipids undergo hydrolysis. 1+1
17. What is meant by i) invert sugar and ii) non-reducing sugar. 1+1
18. Mention an important function of each of the following:
 i) DDT ii) Nitrogen fertilizer
 iii) tranquilizers iv) broad spectrum antibiotics. 0.5x4=2
19. Name the monomers of bakelite and state the polymerisation process of it. 1+1
20. How is granulated zinc obtained? Write its an important application. 1+1
21. Why is silver nitrate solution used for staining fingers of voters during election? 2
22. What is meant by i) quenching of steel. ii) annealing of steel. 1+1

Group 'B'

Attempt any five questions.

5x5=25

23. It is better to express concentration in molality rather than molarity, Why? X gm of a metal (equivalent weight = 12) was completely dissolved in 100 cc of N/2 HCl solution. The volume was then made up to 500 cc. It is found that 25 cc of the diluted acid solution required 17.5 cc of N/10 NaOH for complete neutralization. Find the value of X. 1+4
24. Mention the important applications of standard hydrogen electrode. The standard electrode potential for Fe^{+3}/Fe^{+2} and I_2/I^- are +0.77V and +0.54V respectively

i) Draw the standard cell notation.

ii) Identify the anode and cathode as the current drawn from it.

iii) Write the cell reaction taking place at the electrodes.

iv) Calculate standard cell potential.

1+1+1+1+1

25. State enthalpy of combustion. If heat of formation of CO_2 , H_2O and

$C_6H_{12}O_6$ are -395 KJ mol^{-1} , $-269.4 \text{ KJ mol}^{-1}$ and 1169 KJ mol^{-1} respectively. Calculate the heat of combustion of glucose.

1+4

26. Write the chemistry of corrosive sublimate.

5

27. Starting from Grignard's reagent, how would you prepare

i) propan-ol ii) propan-2-ol. Mention the chemical test to distinguish them. Write down the structural formula of neo-pentyl alcohol and its IUPAC name.

1+1+2+1

28. How is trichloromethane prepared in the laboratory? Why is it discouraged to use chloroform as an anesthesia?

5

29. An aliphatic compound 'A' reacts with $SOCl_2$ to give 'B'. The compound 'B' is heated with ammonia to produce 'C'. The compound 'C' is further heated with Br_2/KOH to yield 'D'. The compound 'D' gives 'E' when treated with $NaNO_2/HCl$ at low temperature. The compound 'E' is primary alcohol which gives positive iodoform test. Identify A, B, C, D and E. Write reactions involved.

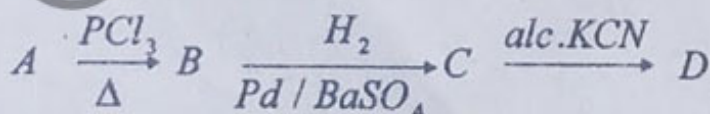
4+1

Group 'C'

Attempt any two questions.

2x10=20

30. Describe laboratory method of preparation of pure and dry nitrobenzene. Identify the major products A, B, C and D in the following reaction sequence



The compound C can be obtained by oxidation of toluene in presence of CeO_2/H^+

6+1+1+1+1

31. (a) How is propanone prepared from

i) 2, 2-dichloro propane

ii) isopropyl alcohol

iii) propyne.

Give the suitable chemical reaction for the conversion of ethanoic acid into

i) methane ii) methyl ethanoate.

3+2

(b) Write down a structural formula of primary, secondary and tertiary amines of each from C_3H_9N . How would you apply Hoffmann's method to separate them from their mixture ? 3+2

32. State Ostwald's dilution law. What is the limitation of this law ? Define the terms i) ionic product of water ii) common ion effect iii) degree of ionisation iv) P^H value. What will be the resultant P^H when 200ml of aqueous solution of HCl ($P^H = 2$) is mixed with 300ml of an aqueous solution of $NaOH$ ($P^H = 12$) ? 1+1+1+1+1+1+4

33. Write short notes on any two. 2x5=10

- i) Chemistry of rusting theory of iron
- ii) Extraction of blister copper from copper pyrites
- iii) Lewis concept of acid and base
- iv) Laboratory preparation of ethoxyethane

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