SECOND YEAR HIGHER SECONDARY EXAMINATION

SAMPLE QUESTION PAPER-2023

Part – III

CHEMISTRY

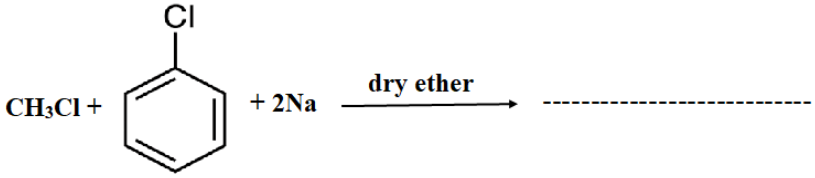
Maximum: 60 scores

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

1. ----------Cell is used in Apollo space programme?
2. In which of the following the central atom/ion is in zero oxidation state?
   a) $[NiCN_4]^{2-}$ b) $[NiCl_4]^{2-}$ c) $[Ni(CO)_4]$ d) $[Ni(NH_3)_6]^{2+}$
3. Which of the following compound undergo an aldol condensation reaction?
   a) HCHO b) C_6H_5CHO c) C_2H5OH d) CH_3CHO
4. The rate constant of a reaction is $3.4\times10^{-5}S^{-1}$. The order of the reaction is ----------
5. Which among the given vitamin is water soluble?
   a) Vitamin A b) Vitamin B c) Vitamin D d) Vitamin K

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

6. What are ideal solutions? Give one example.
7. Draw the structure of chromate and dichromate ion.
8. Identify the product and give the name of the reaction.



9. Which one is more acidic, alcohol or phenol? Give reason.
10. Draw the figure to show the splitting of degenerate orbitals in an octahedral field.
11. Explain any one test to distinguish aldehyde and ketones.
12. Arrange the following amines in the increasing order of their basicity. Justify.
    CH_3NH_2, $(CH_3)_2NH$, $(CH_3)_3N$, NH_3
13. a) Write the Nernst equation for Daniel cell. (1)
    b) Calculate the standard emf of the cell if $E^0_{Zn^{2+}/Zn} = -0.76V$, and $E^0_{Cu^{2+}/Cu} = +0.34V$. (1)
14. Write any two differences between order and molecularity.
15. Which is the major product obtained by the β-elimination of 2-bromopentane? Name the rule which leads to the above product.

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

16. a) Write any two differences between SN^1 and SN^2 reactions. (2)
b) Name the poisonous gas produced when chloroform is exposed to light. (1)

17. How will you make the following conversions?
i. Toluene to benzaldehyde. (1)
ii. Acetic acid to chloroacetic acid (1)
iii. Benzene to benzaldehyde (1)

18. a) What are colligative properties? (1)
b) Calculate the osmotic pressure exerted by a solution prepared by dissolving 1.5 g of a polymer of molar mass 185000 in 500ml of water at 37^0C. (R = 0.0821 L atm/K/mol). (2)

19. a) Write any two differences between primary and secondary cells. (2)
b) What are the advantages of H_2-O_2 fuel cells? (1)

20. How will you distinguish primary, secondary and tertiary amines using the Heinsberg reagent? (3).

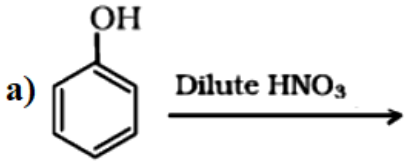
21. a) Write the IUPAC names of $K_3[Fe(CN)_6]$ and $[Co(NH_3)]Cl_3$. (2)
b) Give an example of a hexadentate ligand. (1)

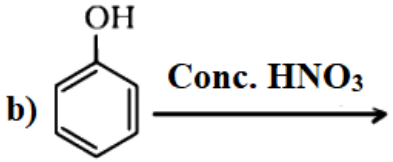
22. Account for the following properties of d-block elements.
i. Variable oxidation state
ii. Formation of coloured ions.
iii. Catalytic property

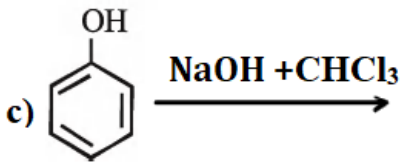
23. a) What is a pseudo first-order reaction? (1)
b) Derive half-life period of a first-order reaction. (2)

24. a) Write Arrhenius equation. (1)
b) Rate constant K_2 of a reaction at 310K is two times of its rate constant K_1 at 300K. Calculate the activation energy of the reaction. (2)

25. Identify the product of the following reaction.

a) 

b) 

c) 

26. a) Match the following. (2)

Column A	Column B
I. Vitamin A II. Starch III. Aldohexose IV. Enzyme	a. Glucose b. Zymase c. Night blindness d. Amylose e. Fructose

b) What is denaturation of proteins? (1)

Answer any 4 from 27-31. Each carries 4 score.

27. a) What type of deviation is shown by a mixture of Chloroform and acetone? Give reason. (2)

b) What is reverse osmosis? Give one application of it. (2)

28. Explain the different types of structural isomerism shown by coordination compounds. Give one example for each. (4)

29. a) Explain the industrial preparation of ethanol. (2)

b) Illustrate the preparation of ether by Williamson's synthesis (2)

30. Explain the following reaction

i. Cannizzaro reaction (1)
ii. Rosenmund reduction (1)
iii. Haloform reaction (1)
iv. Clemmensen reduction (1)

31. a) What is rust chemically? (1)

b) Give any two methods to prevent corrosion. (2)

c) The emf of a mercury cell remains constant throughout its life. why? (1)

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