Reg. No : .....

Name : .....

HSE II

OTTAPALAM CLUSTER

SECOND YEAR QUESTION PAPER 2023

Part – III

CHEMISTRY

Maximum : 60 Scores

Time : 2 Hours

Cool-off Time : 15 Minutes

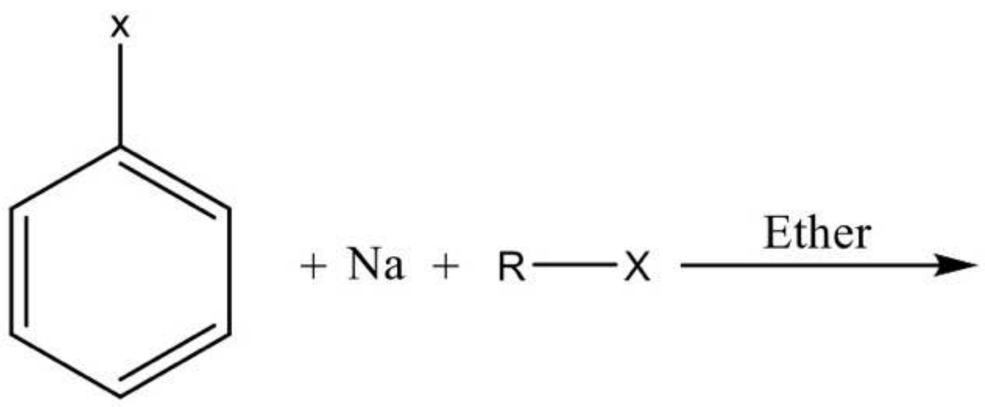
A. Answer any 4 questions from 1 to 5. Each carries 1 score

1. Which of the following is temperature independent (1)
   a. Molarity b. Molality c. Mole Fraction d. All
2. The standard electrode potential of hydrogen electrode is ..... (1)
3. The number of unpaired electrons in Zn^{2+} ion is ..... (1)
4. The coordination number of central metal atom in $[Co(NH_3)_5SO_4]Br$ (1)
5. Ammoniacal silver nitrate solution is commonly known as ..... (1)

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

6. How do conductivity and molar conductivity vary with concentration of electrolytic solutions? (2)
7. Write any two difference between order and Molecularity? (2)
8. What is lanthanide Contraction? Give Reason (2)
9. Name the following i. $[Co(NH_3)_5 NO_2] Cl_2$ (1)
   ii. $K_2 [Fe (CN)_6]$ (1)
10. Explain SN^2 mechanism with suitable (2)
11. Complete the following reaction and give the name of the reaction (2)

i.



20. Describe the method of preparation of $KMnO_4$ from the pyrolusite ore. (3)

21. Give the postulates of Werner's theory (3)

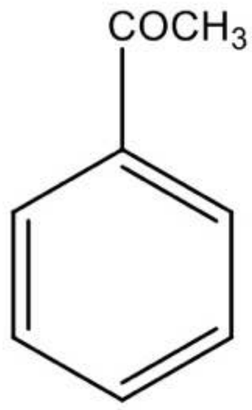
22. Aryl halide are less reactive towards nucleophilic substitution reaction. Why? (3)

23. Aldehydes readily undergo nucleophilic addition reactions. Write any three examples? (3)

24. Complete the reaction (3)

a. $CH_3CHO \xrightarrow{\text{dil.NaOH}}$ .....

b. $HCHO \xrightarrow{\text{Con. KOH}}$ .....

c. 

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25. Complete the following table (3)

Sl No.	Reactant	Reagent	Product	Name of the reaction
1.	$CH_3CH_2NH_2$	.....	CH_3CH_2NC	.....
2.	.....	Br_2/NaOH	CH_3NH_2	.....
3.	Aniline	.....	.....	Diazotization

26. (a). Name the linkage present in proteins (1)

(b). Write any two difference between DNA and RNA (2)

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

27. What is meant by colligative properties? Give the names of important four colligative Properties (4)

28. (a). Write Arrhenius equation (1)

(b) The rate constant of arection at 600 K anfd 900 K are 0.02 s^{-1} and 0.06 s^{-1} respectively. Find the value of Ea and A (3)

29. (a) Draw the crystal field splitting in octahedral complex (2)

(b). Explain ionization isomerism and coordination isomerism with examples (2)

30. (a). What is Lucas reagent? How will you distinguish 1°, 2°, 3° alcohols? (2)

(b). Explain a method for manufacturing ethanol (2)

31. Explain with chemical equation

(i). HVZ Reaction (1)

(ii). Etards Reaction (1)

(iii). Haloform Reaction (1)

(iv). Rosenmud's Reduction (1)

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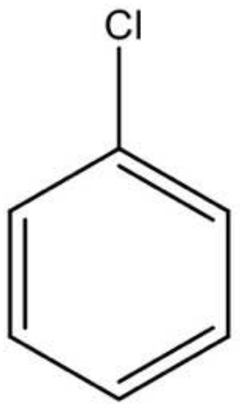
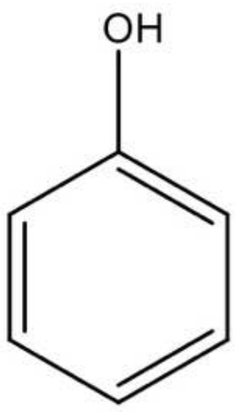
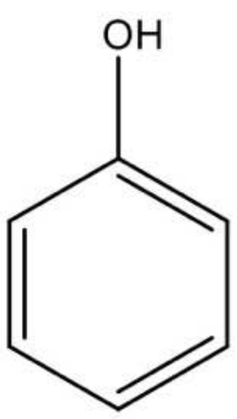
ii  + Na $\xrightarrow{\text{Ether}}$

12. Write the chemical equation representing Reimer-Tiemann reaction (2)
13. Complete the Following (2)

i  $\xrightarrow{\text{dil. } HNO_3}$

ii  $\xrightarrow{\text{Con. } HNO_3}$

14. Write the correct order of basic nature of the following amines in (2)
    (a). gaseous phase and (b). aqueous phase
    CH_3NH_2, $(CH_3)_2$ NH, $(CH_3)_3N$
15. How are vitamins classified? Give Example for each (2)

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

16. State Henry's Law. Give any two application (3)
17. Write the half cell reaction of the following cell
a) $Cu_{(s)} + 2Ag^{+}_{(aq)} \longrightarrow Cu^{2+}_{(aq)} + 2Ag_{(s)}$ (1)
b) λ^{o}_{m} for NaCl, HCl, and CH_3COONa are 126.4, 425.9 and 91.0 S Cm^2 Mol^{-1} respectively. Calculate the λ^{o}_{m} for CH_3COOH (2)
18. (a). Identify the weak electrolyte from the following
    i. KCl ii. NaCl iii. KBr, iv. CH_3COOH (1)
    b. Write the anode and cathode reactions occur during the working and recharging of a lead storage battery. Mention the electrolyte used in the battery. (2)
19. (a). Write an example for zero order reactions (1)
    (b). Derive the integrated rate equation for a zero order reaction (2)