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SET NO. 1



INDIAN SCHOOL MUSCAT
FIRST TERM EXAMINATION
CHEMISTRY

CLASS: XII
13.05.2018

Sub. Code: 043

Time Allotted: 3 Hrs
Max. Marks: 70

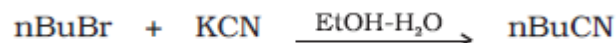
General Instructions:

- All questions are compulsory
- Mark for each question is indicated against it.
- Question numbers 1 to 5 are very short answer questions and carry one mark each.
- Question numbers 6 to 12 are short answer questions and carry two marks each.
- Question numbers 13 to 24 are short answer questions and carry three marks each.
- Question numbers 25 to 27 are long answer questions and carry five marks each

1. "Hypophosphorus acid is a good reducing agent." Justify with an example 1
2. What is the covalency of Nitrogen in N_2O_3 ? 1
3. How is 'Wood spirit' manufactured? 1
4. Which alkyl halide from the following pair would you expect to react more rapidly by an S_N2 mechanism and why?
 CH_3Br or CH_3I 1
5. How do you account for the miscibility of ethoxyethane with water? 1
6. Explain Brown ring test for nitrates with chemical equations involved. 2
OR
Explain the manufacture of ammonia by Haber's process.
7. Out of the following hydrides of Group 15 elements which will have : 2
i) NH_3 ii) PH_3 iii) AsH_3 iv) SbH_3
a) Lowest boiling point
b) highest bond angle
c) Maximum reducing property
d) Highest thermal stability

8. Write the IUPAC name of the following. 2
- $C_6H_5CH_2C(OH)(CH_3)CH_2CH=CHCH_3$
 - p-ClC₆H₄CH₂CH(CH₃)₂
9. Distinguish between the following pairs of organic compounds. 2
- Chlorobenzene and benzyl chloride
 - Phenol and ethanol
10. Write the structural formula of the following 2
- 3-Phenoxyheptane.
 - tert-pentyl alcohol
11. Predict the major product when 2
- Ethoxy benzene is treated with HI?
 - Tert-butyl chloride is treated with sodium methoxide?
12. Write short note on Lucas test. 2
13. How is HNO₃ prepared commercially? Write the reaction conditions and chemical equations. 3
- OR**
- Distinguish between white phosphorous and red phosphorous. (any three points of differences)
14. Complete and balance the following equations. 3
- $PCl_3 + H_2O \rightarrow$
 - $P_4 + SOCl_2 \rightarrow$
 - $Cu + HNO_3(\text{conc.}) \rightarrow$
15. Draw the molecular shape of the following. 3
- Cyclotrimetaphosphoric acid
 - N₂O₅
 - H₄P₂O₇
16. Give reasons for the following 3
- The C–O–C bond angle in dimethylether is more than tetrahedral angle.
 - Phenols are more acidic than alcohols.
 - o-Nitrophenol is steam volatile but p-nitrophenol is not
17. Write the mechanism for hydration of ethene to yield ethanol. 3

18. An organic compound (A) reacts with SOCl_2 to give compound (B). (B) reacts with Mg to form Grignard reagent which is treated with acetone and the product is hydrolysed to give 2-methyl butan-2-ol. Identify A & B and write the chemical equations involved. **3**
19. Explain the following with an example. **3**
- Hydroboration –oxidation.
 - Reimer-Tiemann reaction.
 - Williamson's synthesis.
20. a) Write the structure of an alkyl halide having molecular formula $\text{C}_4\text{H}_9\text{Cl}$ is optically active. **3**
 b) Write the mechanism of the following reaction:

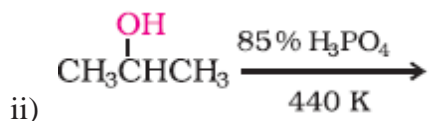
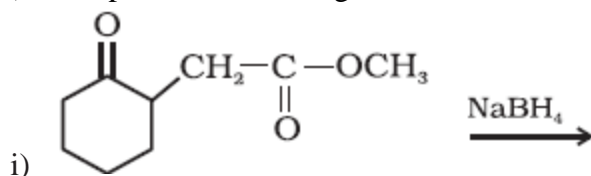


21. Effect the following conversions: **3**
- Benzene to p-chloroacetophenone
 - Isobutylbromide to tert-butyl bromide.
 - Aniline to Iodobenzene
22. Define: **3**
- Racemisation
 - Chirality
 - Freons
23. What happens when **3**
- Ethyl chloride is treated with AgNO_2
 - 2,4,6-trinitrochlorobenzene is subjected to hydrolysis.
 - Cyclohexene is treated with $\text{Br}_2/h\nu$.
24. Account for the following **3**
- Chloroform is stored in closed dark coloured bottles completely filled.
 - The carbon– oxygen bond length in phenol is slightly less than that in methanol.
 - Alkyl halides though polar, are immiscible with water.
25. a) Write chemical equations for the following reactions. **5**
- 3° butyl alcohol with Cu at 573K
 - Bromination of anisole in ethanoic acid
 - Oxidation of isopropyl alcohol with chromic anhydride (CrO_3)
- b) Arrange the following compounds in increasing order of the property mentioned:
- 2,4,6-trinitrophenol, 3,5-dinitrophenol, phenol, o-Cresol (Acid strength)
 - Pentan-1-ol, n-butane, Pentanal, Ethoxyethane (Boiling point)

OR

- a) Effect the following conversions
- Phenol to Aspirin
 - Ethanol to Propan-2-ol
 - Cumene to Phenol

b) Complete the following



26. a) An organic compound (A) of molecular formula C_7H_8 undergoes free radical chlorination in presence of uv light to form (B), which on treatment with KCN forms (C). Compound (C) on acid hydrolysis gives (D). Compound (B) on reaction with sodium metal in presence of ether form hydrocarbon (E). Identify A, B, C, D and E and write equations for the reactions involved. 5

OR

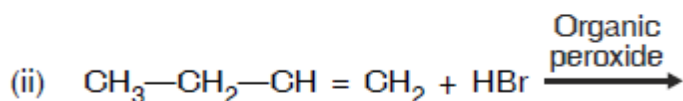
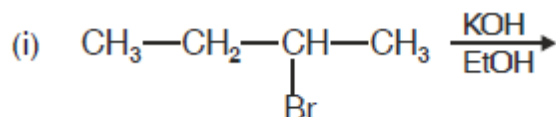
a) Explain the following reactions with equations

i) Swarts reaction.

ii) Finkelstein reaction.

iii) Friedel-Crafts acylation of chlorobenzene.

b) Write the major products and name the rule responsible for the formation of it.



27. a) How is PH_3 prepared in the laboratory? 5
b) How is it purified?
c) How does the solution of PH_3 in water react on irradiation with light and on absorption in $CuSO_4$?
d) How can you prove that PH_3 is basic in nature?

OR

Account for the following

- $R_3P=O$ exist but $R_3N=O$ does not.
- Ammonia is a good complexing agent.
- Bond angle in PH_4^+ is higher than that in PH_3
- N_2 is less reactive at room temperature
- +5 oxidation state of Bi is less stable than +3.

End of the Question Paper

