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| Grade : XII | Subject : Chemistry | Name: |
| Date : 28/06/2019 | Worksheet | Chapter No. 10,11,12 and 13 |

General Instructions:

- (i) All questions are compulsory.
- (ii) This question paper has four sections: Section A, Section B, Section C and Section D.
- (iii) Section A contains **one** mark question each, section B contains questions of **two** marks each, section C contains questions of **three** marks each, section D contains questions of **five** marks each.

SECTION – A

1. The compound obtained when acetaldehyde reacts with dilute aqueous sodium hydroxide exhibits
 - a) geometrical isomerism
 - b) optical isomerism
 - c) both optical and geometrical isomerism
 - d) neither optical nor geometrical isomerism
- 2.. Benzaldehyde and acetone can be best distinguished using
 - a) hydrazine
 - b) Tollen's reagent
 - c) sodium hydroxide solution
 - d) 2, 4-DNP
3. The compound formed as a result of oxidation of ethyl benzene by KMnO_4 is

 - a) Benzyl alcohol
 - b) Benzoic acid
 - c) Acetophenone
 - d) Benzophenone

4. Which of the following is correct?
 - a) Any aldehyde gives secondary alcohol on reduction
 - b) Reaction of vegetable oil with H_2SO_4 gives glycerine
 - c) $\text{C}_2\text{H}_5\text{OH}$, iodine with NaOH gives iodoform
 - d) Sucrose on reaction with NaCl give invert sugar
5. When a primary amine reacts with chloroform in ethanolic KOH , then the product is a an
 - a) isocyanide
 - b) aldehyde
 - c) cyanide
 - d) alcohol
6. The oxidation of aniline by $\text{K}_2\text{Cr}_2\text{O}_7/\text{H}_2\text{SO}_4$ produces mainly
 - a) Nitrobenzene
 - b) Benzoic acid
 - c) p-benzoquinone
 - d) Benzamide
7. Aniline reacts with bromine in aqueous medium to form
 - a) 2, 4, 6-tribromoaniline.
 - b) $\text{C}_6\text{H}_5\text{NHBr}$
 - c) N, N-Dibromoaniline
 - d) m-bromoaniline
8. Which of the following amine cannot be prepared by Gabriel's synthesis ?
 - a) n-propylamine
 - b) iso-propylamine
 - c) iso-butylamine
 - d) 2-phenyl ethylamine

9. An aliphatic amine with molecular mass 73 on heating with excess of CH_3I gave a quaternary salt which of the following amines does not correspond to this data
- a) N, N-Diethylethanamine b) N-Methylpropanamine c) 2-Butanamine d) Neopentylamine.
10. Which reagent can provide distinction between aliphatic $-\text{NH}_2$ group and aromatic $-\text{NH}_2$ group ?
- a) Benzene diazonium chloride b) Benzene sulphonyl chloride c) CHCl_3/KOH d) CH_3COCl
11. Presence of a nitro group in a benzene ring
- a) renders the ring basic b) deactivates the ring towards nucleophilic substitution
- c) by reacting bromobenzene with NaF solution d) by heating phenol with HF and KF
12. In the chemical reaction, $\text{CH}_3\text{CH}_2\text{NH}_2 + \text{CHCl}_3 + 3\text{KOH} \rightarrow (\text{A}) + (\text{B}) + \text{H}_2\text{O}$.
- The compounds (A) and (B) are respectively.
- a) $\text{CH}_3\text{CH}_2\text{CONH}_2$ and 3KCl b) $\text{C}_2\text{H}_5\text{NC}$ and K_2CO_3 c) $\text{C}_2\text{H}_5\text{NC}$ and 3KCl d) $\text{C}_2\text{H}_5\text{CN}$ and 3KCl
13. An aliphatic amine on treatment with alcoholic carbon disulphide and mercuric chloride forms ethyl isothiocyanate. The reaction is known as
- a) Hoffmann's reaction b) Hoffmann's rearrangement
- c) Hoffmann's mustard Dil reaction d) Hoffmann's bromide degradation reaction
14. Which of the following acids does not exhibit optical isomerism?
- a) Lactic acid b) Tartaric acid c) Maleic acid d) α -amino acids
15. CH_3CHO and $\text{C}_6\text{H}_5\text{CH}_2\text{CHO}$ can be distinguished chemically by _____.
- a) Tollen's reagent test b) Fehling solution test c) Benedict test d) Iodoform test
16. The correct order of decreasing acid strength of trichloroacetic acid (A), trifluoroacetic acid (B), acetic acid (C) and formic acid (D) is _____.
- a) $\text{A} > \text{B} > \text{C} > \text{D}$ b) $\text{A} > \text{C} > \text{B} > \text{D}$ c) $\text{B} > \text{A} > \text{D} > \text{C}$ d) $\text{B} > \text{D} > \text{C} > \text{A}$
17. One mole of a symmetrical alkene on ozonolysis gives two moles of an aldehyde having molecular mass of 44u. The alkene is _____.
- a) Propene b) Ethene c) 1-butene d) 2-butene
18. The correct sequence of steps involved in the mechanism of Cannizzaro's reaction is _____.
- a) Nucleophilic attack, transfer of H^- and transfer of H^+
- b) Electrophilic attack by OH^- , transfer of H^+ and transfer of H^-
- c) Transfer of H^- , transfer of H^+ and nucleophilic attack
- d) Transfer of H^+ , nucleophilic attack and transfer of H^-
19. Choose the correct option from the following.
- a) Propanol has lower boiling point than butane.
- b) o-nitrophenol is more acidic than o-methoxyphenol
- c) Phenol is a weaker acid than an alcohol.
- d) All of these

20. Phenol reacts with bromine water to give_____.

- a) 2-bromophenol b) 4-bromophenol c) 2,4,6-tribromophenol d) All of these

21. The relative ease of dehydration of alcohols follows the following order:

- a) $3^{\circ} > 2^{\circ} > 1^{\circ}$ b) $1^{\circ} > 2^{\circ} > 3^{\circ}$ c) $2^{\circ} > 3^{\circ} > 1^{\circ}$ d) None of these

22. Catalyst used for Wolf-Kishner reduction reaction is _____.

- a) $\text{NH}_2\text{-NH}_2/\text{KOH}$ b) Zn-Hg/HCl c) HI/Red P d) LiAlH_4

SECTION – B

23. Give reasons :

(i) Racemic mixture is optically active.

(ii) The presence of nitro group at o-p positions increases the reactivity of haloarenes towards nucleophilic substitution reactions.

24.. Give reasons:

(i) C-Cl bond length in chlorobenzene is shorter than C-Cl bond length in CH_3Cl .

(ii) SN^1 reactions are accompanied by racemization in optically active alkyl halides.

25. Suggest a possible reason for the following observations:

(i) The order of reactivity of haloalkanes is $\text{RI} > \text{RCl} > \text{RBr}$.

(ii) Neopentyl chloride does not follow SN^2 mechanism.

26. How do you convert? (i) Cl-benzene to biphenyl (ii) 2-bromobutane to but-2-ene

27. Explain the following with an example for each : (i) Kolbe's reaction (ii) Reimer-Tiemann reaction

28. Write the equations involved in the following reactions: (i) Stephen Reaction (ii) Etard Reaction

29.(a) Give a sample chemical test to distinguish between aniline and N,N-dimethylaniline.

(b) Arrange the following in the increasing of their pK_b values: $\text{C}_6\text{H}_5\text{NH}_2$, $\text{C}_2\text{H}_5\text{NH}_2$, $\text{C}_6\text{H}_5\text{NHCH}_3$.

30. Write the mechanism of acid dehydration of ethanol to yield ethene.

31. Explain the mechanism of acid catalysed hydration of an alkene to form corresponding alcohol.

32. Write the reactions involved in the following:

(i) Hell-Volhard-Zelinsky reaction. (ii) Decarboxylation reaction.

33. Illustrate the following reactions giving suitable example in each case:

(i) Ammonolysis (ii) Acetylation of amines

35. Give reasons:

- (a) Aniline does not give Friedel-Crafts reaction. (b) Aniline is a weaker base than cyclohexylamine.

SECTION – C

36. Write the chemical equations involved when aniline is treated with the following reagents:

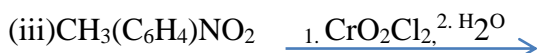
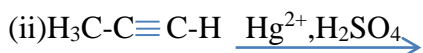
- (i) Bromine water (ii) HCl (iii) ethanolic chloroform

37. How are the following conversions carried out?

- (i) Benzyl chloride to benzyl alcohol
(ii) Ethyl magnesium chloride to propan-1-ol
(iii) Propene to propan-2-ol

38. Acid catalysed dehydration of tert-butanol is faster than that of n-butanol. Explain.

39. Write the structures of the main products of the following reactions:



40. (A), (B) and (C) are three non-cyclic functional isomers of a carbonyl compound with molecular formula C_4H_8O . Isomers (A) and (C) give positive Tollens' test whereas isomer (B) does not give Tollens' test but gives positive iodoform test. Isomers (A) and (B) on reduction with Zn-Hg/conc. HCl give the same product (D).

- (a) Write the structures of (A), (B), (C) and (D).
(b) Out of A, B and C isomers, which one is least reactive towards addition of HCN?

41. An aromatic compound 'A' on treatment with aqueous ammonia and heating forms compound 'B' which on heating with Br_2 and KOH forms a compound 'C' of molecular formula C_6H_7N . Write the structures and IUPAC names of compounds A, B and C.

42. Write the chemical equations to illustrate the following name reactions:

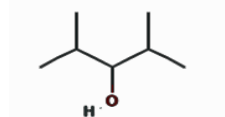
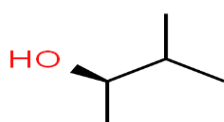
- (i) Wolf-Kishner reduction (ii) Aldol condensation (iii) Cannizzaro reaction.

SECTION – D

43. (a) Give the IUPAC name of the following: (i) $(CH_3CH_2)_2NCH_3$ (ii) $H_2NCH_2CH_2CH=CH_2$

- (b) Illustrate the following with an example of reaction in each case:
(i) Sandmeyer reaction (ii) Coupling reaction.
(c) Which of the two is more basic and why? CH_3NH_2 or NH_3

44. (a) Identify the chiral molecule in the following pair:

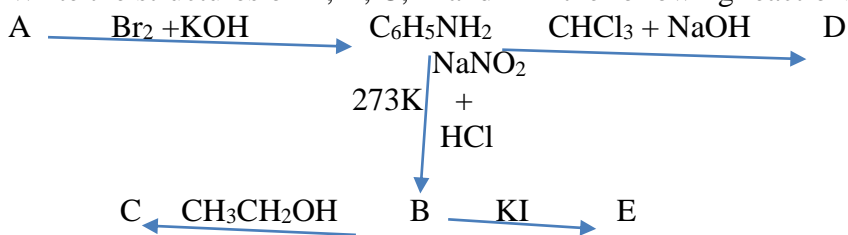


(b) Write the structure of the product when chlorobenzene is treated with methyl chloride in the presence of sodium metal and dry ether.

(c) Write the structure of the alkene formed by dehydrohalogenation of 1-bromo-1-methylcyclohexane with alcoholic KOH.

(d) Draw the structure of 3-bromo-2-methylprop-1-ene and 2-bromopentane.

45. An aromatic compound 'A' of molecular formula C_7H_7ON undergoes a series of reactions as shown below. Write the structures of A, B, C, D and E in the following reactions:



46. (a) What are ambident nucleophiles? Explain with an example.

(b) Differentiate between SN^1 and SN^2 mechanisms and give examples.