V-JEE INSTITUTE

CHEMISTRY - XII

Nitrogen contaning organic compunds, Biomolecules

Name :..... Total Marks = 164

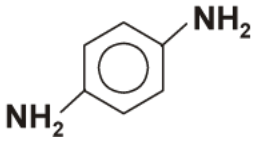
Time : 6 hr Date: 25/10/2017

Q1. Draw the structure of ***p-toluidine*** compound and give IUPAC name. **1**

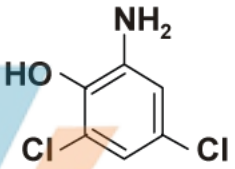
Q2. Draw the structure of ***N-isopropylaniline*** compound and give IUPAC name. **1**

Q3. Draw the structure of ***t-butylamine*** compound and give IUPAC name. **1**

Q4. Give the IUPAC names of the following compound. **1**



Q5. Give the IUPAC names of the following compound. **1**



Q6. Why does methylamine has lower boiling point than methanol? **1**

Q7. Why is it difficult to prepare pure amines by ammonolysis of alkyl halides? **1**

Q8. Can tertiary amines undergo acetylation reactions? Explain. **1**

Q9. Methylamine in water reacts with ferric chloride to precipitate ferric hydroxide. Explain. **1**

Q10. Although boron trifluoride adds on trimethylamine but it does not add on triphenylamine. Explain. **1**

Q11. Why does silver chloride dissolve in methylamine solution? **1**

Q12. Although trimethyl amine and *n*-propylamine have same molecular mass, the former boils at a lower temperature (276 K) than the latter (322 K). Why? **1**

Q13. Account for the correct order of decreasing basicity of ethylamine, 2-aminoethanol and 3-amino-1-propanol. **1**

Q14. Why do amines react as nucleophiles? **1**

Q15. Aniline does not undergo Friedel Crafts alkylation. Explain. **1**

Q16. Suggest a structural formula of a compound having molecular formula $C_8H_{11}N$ (A) which is optically active, dissolves in dil. aqueous HCl and release N_2 with nitrous acid. **1**

Q17. Why are amines less acidic than alcohols of comparable molecular masses? **1**

Q18. Tertiary butyl amine cannot be prepared by the action of NH_3 on tertiary butyl bromide. Explain. **1**

Q19. Why pK_b of aniline is more than that of methylamine. **1**

Q20. Although amino group is *o*- and *p*-directing in aromatic electrophilic substitution reactions, aniline on nitration gives a substantial amount of *m*-nitroaniline. Explain. **1**

Q21. Why diazonium salts of aromatic amines are more stable than those of aliphatic amines? **1**

Q22. For an amine RNH_2, write expression for K_b to indicate its base strength. **1**

Q23. Complete the following reactions: $C_6H_5NH_2 + H_2SO_4(conc.) \longrightarrow$ **1**

Q24. Write the conversion of benzyl chloride to 2-phenylethanamine. **1**

Q25. What is isoelectric point of amino acid? How does it help in the separation of amino acids? **1**

Q26. Write the conversion of aniline to *p*-bromoaniline. **1**

Q27. What is the basic structural difference between starch and celllulose? **1**

Q28. What are enzymes? **1**

Q29. Write two main functions of carbohydrates in plants. **1**

Q30. Classify the following into monosaccharides and disaccharides: **1**
Ribose, 2-deoxyribose, maltose, galactose, fructose and lactose.

Q31. Why vitamin C cannot be stored in our body? **1**

Q32. Give the decreasing order of boiling points for the following: **1**

(a) Me⌒⌒Me (b) Me⌒⌒OH (c) Me⌒⌒NH_2

Q33. Give the decreasing order of solubility of the following in H_2O: **1**

(a) $PhNH_2$ (b) Et_2NH (c) $EtNH_2$

Q34. Give the decreasing order of boiling points of the following: **1**

(a) EtOH (b) Me_2NH (c) $EtNH_2$

Q35. Arrange the following in the increasing order of solubility in water **1**

$C_6H_5NH_2$, $(C_2H_5)_2NH$, $C_2H_5NH_2$.

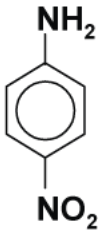
Q36. Arrange the following in the decreasing order of their basic strength: **1**

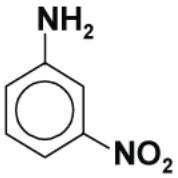
(a) $PhNH_2$ (b) $EtNH_2$ (c) Et_2NH (d) NH_3

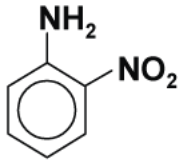
Q37. Arrange the following in the decreasing order of their basic strength: **1**

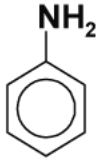
(a) $EtNH_2$ (b) $PhNH_2$ (c) NH_3 (d) $PhCH_2NH_2$

Q38. Arrange the following according to decreasing basic character. **1**

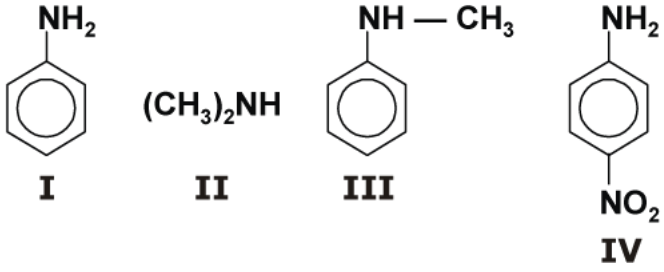
(a) 

(b) 

(c) 

(d) 

Q39. Arrange the following according to decreasing basic character. 1



Q40. Arrange the following according to decreasing order of basic strength 1

$C_6H_5NH_2$, $C_6H_5N(CH_3)_2$, $(C_2H_5)_2NH$ and CH_3NH_2

Q41. Arrange the following according to increasing order of basic strength 1

Aniline, *p*-nitroaniline and *p*-toluidine

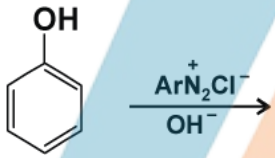
Q42. Arrange the following according to increasing order of basic strength 1

$C_6H_5NH_2$, $C_6H_5NHCH_3$, $C_6H_5CH_2NH_2$

Q43. Arrange the following according to decreasing order of basic strength in gas phase 1

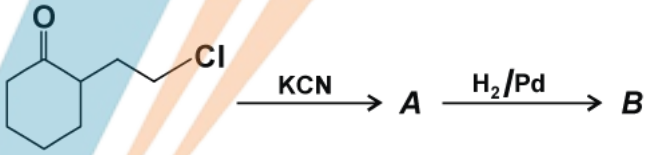
$C_2H_5NH_2$, $(C_2H_5)_2NH$, $(C_2H_5)_3N$ and NH_3

Q44.Complete the following reaction. 1



Q45.Why is aniline soluble in aqueous HCl? 1

Q46.Identify *A* and *B* in the following reaction. 1



Q47.Write short notes on the carbylamine reaction. 1

O48.Write short notes on the diazotisation. 1

O49.Write short notes on the Hoffmann's bromamide reaction. 1

Q50.Write short notes on the coupling reaction. 1

Q51.Complete the following reactions: $C_6H_5N_2Cl + H_3PO_2 + H_2O \longrightarrow$ 1

Q52.Complete the following reactions: $C_6H_5NH_2 + CHCl_3 + \text{alc. KOH} \longrightarrow$ 1

Q53. What products would be formed when a nucleotide from DNA containing thymine is hydrolysed? 1

Q54. Complete the following reactions: $C_6H_5N_2Cl + C_2H_5OH \longrightarrow$ 1

Q55. Complete the following reactions: $C_6H_5NH_2 + Br_2(aq) \longrightarrow$ 1

Q56. Complete the following reactions: $C_6H_5NH_2 + (CH_3CO)_2O \longrightarrow$ 1

Q57. The melting point and solubility in water of amino acids are generally higher than that of the corresponding halo acids. Explain. 1

Q58. Where does the water present in the egg go after boiling the egg? 1

Q59. What are essential amino acids? 1

Q60. On electrolysis in acidic solution amino acids migrate towards cathode while in alkaline solution these migrate towards anode. Why? 1

Q61. What products are expected when lactose is hydrolysed? 1

Q62. Write the equation which shows that glucose produces energy in living beings. 1

Q63. Write the conversion of acetanilide $\longrightarrow$ *p*-nitroaniline. 1

Q64. Name the monosaccharide units in maltose. 1

Q65. Glucose or sucrose are soluble in water but cyclohexane or benzene (simple six membered ring compounds) are insoluble in water. Explain. 1

Q66. Write the chemical reaction equation stating the reaction conditions required of the following conversion of aniline to phenol. 1

Q67. Write the chemical reaction equation to conversion of chlorobenzene from aniline. 1

Q68. Which linkage is present between the two units of monosaccharides in disaccharide? 1

Q69. How many members are presents in the ring of fructose present in sucrose? 1

Q70. What is the monomer unit of cellulose and starch? 1

Q71. Pyranose structure of glucose contains how many members in the ring? 1

Q72. Name any aldotetrose ; Aldopentose-Ribose. 1

Q73. Give one example each for disaccharide and polysaccharide. 1

Q74. Write the name of anomers of glucose. 1

Q75. Identify (A), (B) and (C) in $C_6H_5COOH \xrightarrow{PCl_5} A \xrightarrow{NH_3} B \xrightarrow{P_3O_5} C_6H_5CN \xrightarrow{H_2, Ni} C$ 2

Q76. How will you convert ethanamine into methanamine? 2

Q77. How will you convert benzoic acid to aniline? 2

Q78. How will you convert aniline to *p*-bromoaniline? 2

Q79. How do aromatic and aliphatic primary amines react with nitrous acid? 2

Q80. How will you convert from benzamide to toluene? 2

Q81. Give one chemical test to distinguish between secondary and tertiary amines. 2

Q82. Give one chemical test to distinguish between ethylamine and aniline. 2

Q83. Give one chemical test to distinguish between aniline and benzylamine. 2

Q84. Give one chemical test to distinguish between aniline and *N*-methylaniline. 2

Q85. How will you convert ethanoic acid into propanoic acid? 2

Q86. Give one chemical test to distinguish between methylamine and dimethylamine. 2

Q87. How will you convert aniline to benzyl alcohol? 2

Q88. Describe the method for identification of primary, secondary and tertiary amines. Also write the chemical equations of the reactions involved. 2

Q89. How will you convert benzyl chloride to 2-phenylethanamine? 2

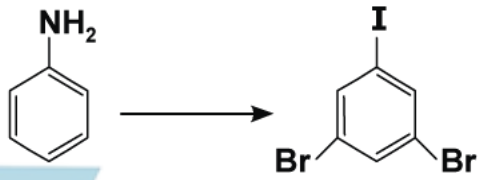
Q90. Why does the reactivity of NH_2 get reduced in acetanilide? 2

Q91. Identify (A), (B) and (C) in $CH_3CH_2OH \xrightarrow{KMnO_4} A \xrightarrow[(ii)\ NH_3]{(i)\ SOCl_2} B \xrightarrow[NaOH]{Br_2} C$ 2

Q92. 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 compound A, B and C. 2

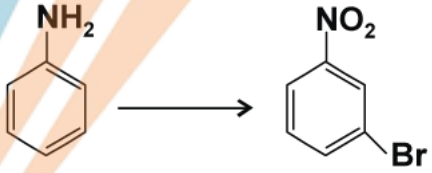
Q93. Write short notes on the Gabriel phathalamide synthesis. 2

Q94. How will you carry out the following conversion? 2



Q95. Identify (A), (B) and (C) in $CH_3CH(CH_3)-CONH_2 \xrightarrow{Br_2, NaOH} A \xrightarrow{HONO} B \xrightarrow{O} C$ 2

Q96. How will you carry out the following conversion? 2



Q97. How will you convert methanol to ethanoic acid? 2

Q98. How will you convert ethanoic acid into methanamine? 2

Q99. Explain the observed K_b order for $Et_2NH > Et_3N > EtNH_2$ in aqueous solutions. 2

Q100. Which of the following is more basic in each set of species. Give reasons: 2
(a) Aniline and *p*-anisidine (b) Aniline and *m*-toluidine.

Q101. Why does bromination of aniline, even under very mild conditions give 2, 3, 5-tribromoaniline instantaneously? 2

Q102. What will be the basic strength order of $C_2H_5NH_2$, $(C_2H_5)_2NH$, $(C_2H_5)_3N$ in gas phase and compaire with aqueous state? Explain. 2

Q103. Glycine exists as $NH_3^+CH_2COO^-$, zwitter ion but anthranilic acid (*p*-amino benzoic acid) does not exist as zwitter ion. Why? 2

Q104. Account for the following order of increasing basicity: 2

$$\underset{\text{Nitrile}}{RC\equiv N} < \underset{\text{Imine}}{R'CH=NR} < \underset{\text{Amine}}{RNH_2}$$

Q105. Sulphanilic acid is soluble in di.NaOH but not in di.HCl. Explain. 2

Q106. Complete and name the following reactions: 2
(a) $RNH_2 + CHCl_3 + 2KOH \longrightarrow$ (b) $RCONH_2 + Br_2 + 4NaOH \longrightarrow$

Q107.	How do you explain the absence of aldehyde group in the penta acetate of D-glucose?	2
Q108.	What is glycogen? How is it different from starch?	2
Q109.	What are the hydrolysis products of (a) Sucrose and (b) lactose	2
Q110.	Enumerate the reactions of D-glucose which cannot be explained by its open chain structure.	2
Q111.	What are essential and non-essential amino acids? Give examples of each type.	2
Q112.	How do you explain the amphoteric behaviour of amino acids?	2
Q113.	How are vitamins classified? Name the vitamin responsible for the coagulation of blood?	2
Q114.	Why are vitamin A and vitamin C essential to us? Give their important sources.	2
Q115.	What are nucleic acids? Mention their two important functions.	2
O116.	What is the difference between a nucleoside and a nucleotide?	2
Q117.	Write important structural and functional differences between DNA and RNA.	2
Q118.	Differentiate between primary and secondary structure of protein.	2
O119.	Differentiate between saccharides.	2