Date : **TEST ID: XIICH1302**
Marks : **CHEMISTRY**

AMINES

Single Correct Answer Type

31. Gas evolved during the reaction of sodium metal on ethyl amine is:
a) N_2 b) C_2H_2 c) H_2 d) CO_2

32. Which will not go for diazotization?
a) $C_6H_5NH_2$ b) $C_6H_5CH_2NH_2$ c)  d) 

33. Aniline is prepared in presence of Fe/HCI from
a) Benzene b) Nitrobenzene c) Dinitrobenzene d) None of these

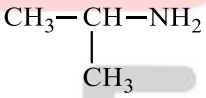
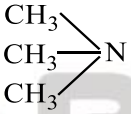
34. Amines have:
a) Garlic odour b) Fishy odour c) jasmine odour d) Bitter almonds odour

35. $CH_3CH_2NH_2$ contains a basic NH_2 group, but CH_3CONH_2 does not, because:
a) Acetamide is amphoteric in character
b) In $CH_3CH_2NH_2$ the electron pair on N-atom is delocalised by resonance
c) In $CH_3CH_2NH_2$ there is no resonance, while in acetamide the lone pair of electron on N-atom is delocalised and therefore less available for protonation
d) None of the above

36. High basicity of Me_2NH relative to Me_3N is attributed to
a) Effect f solvent b) Inductive effect of Me c) Shape of Me_2NH d) Shape of Me_3N

37. In the reaction $RCONH_2 + X \rightarrow RNH_2$, the regent X is
a) Soda lime b) PCl_5 c) NaOBr d) All of these

38. Which one of the following is most basic?
a) FCH_2NH_2 b) $FCH_2CH_2NH_2$ c) $C_6H_5NH_2$ d) $C_6H_5CH_2NH_2$

39. Which one of the following amines will not react with HNO_2 acid to give nitrogen?
a) CH_3NH_2 b) $CH_3CH_2NH_2$ c)  d) 

40. $(CH_3)_3N \xrightarrow[(ii)H_2O,\Delta]{(i)BrCN} [X]$, here $[X]$ is
a) CH_3NH_2 b) $(CH_3)_2NH$ c) $(CH_3)_3NO$ d) $(CH_3)_2NNO$

41. Hinsberg's method to separate amines is based on the use of:
a) Benzene sulphonyl chloride
b) Benzene sulphonic acid
c) Ethyl oxalate
d) Acetyl chloride

42. A primary amine hated with CS_2 in presence of excess of $HgCl_2$ gives isothiocyanate. The reaction is called:
a) Hofmann's bromamide reaction
b) Hofmann's mustard oil reaction
c) Perkin's condensation
d) Hofmann's elimination

43. Pyrolysis of  would give
a) Mixture of $CH_2 = CH - CD_3$ and $CH_3 - CH = CD_2$ b) $CH_3 - CH = CD_2$
c) $Me_2N^+ = C(CD_3)(CH_3)$ d) $CH_2 = CH - CD_3$

44. Ethyl isocyanide on hydrolysis in acidic medium generates
a) Ethylamine salt and methanoic acid
b) Propanoic acid and ammonium salt
c) Ethanoic acid and ammonium salt
d) Methylamine salt and ethanoic acid

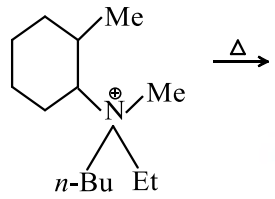
45. When aniline is treated with sodium nitrite and hydrochloric acid at 0°C, it gives
a) Phenol and N_2
b) Diazonium salt
c) Hydrazo compound
d) No reaction takes place

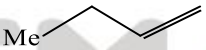
46. Which of the following is not correct?
a) Ethylamine and aniline both have NH_2 group
b) Ethylamine and aniline both dissolve HCl
c) Ethylamine and aniline both react with $CHCl_3$ and KOH to form unpleasant smell
d) Ethylamine and aniline both react with $NaNO_2 + HCl$ to give hydroxyl compounds in cold

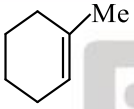
47. Amine is not formed in the reaction
(A) Hydrolysis of RCN
(B) Reduction of RCH = NOH
(C) Hydrolysis of RNC
(D) Hydrolysis of RCONH$_2$
The correct answer is
a) A, B, D
b) A, D
c) B, C
d) A, B, C

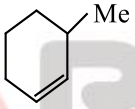
48. During coupling reaction of benzene diazonium chloride and aniline, the pH of reaction medium should be approximately
a) 1−2
b) 9−10
c) 4−5
d) 7−8

49. The amine which will not liberate nitrogen on reaction with nitrous acid is
a) Trimethyl amine
b) Ethyl amine
c) Sec-butyl amine
d) t-butyl amine

50. 

The alkane formed as a major product in the given elimination reaction is:
a) 

b) $CH_2{=}CH_2$
c) 

d) 

51. Carbylamine reaction is given by aliphatic
a) Primary amine
b) Secondary amine
c) Tertiary amine
d) Quaternary ammonium salt

52. Nitrobenzene is reduced by Zn and alcoholic potash mixture to get
a) $C_6H_5 - NH_2$
b) $C_6H_5 - NH - NH - C_6H_5$
c) $C_6H_5 - N - N - C_6H_5$
d) $C_6H_5 - NH - CO - C_6H_5$

53. The decreasing order of basic characters of the three amines and ammonia is
a) $NH_3 > CH_3NH_2 > C_2H_5NH_2 > C_6H_5NH_2$
b) $C_2H_5NH_2 > CH_3NH_2 > NH_3 > C_6H_5NH_2$
c) $C_6H_5NH_2 > C_2H_5NH_2 > CH_3NH_2 > NH_3$
d) $CH_3NH_2 > C_2H_5NH_2 > C_6H_5NH_2 > NH_3$

54. Which of the following is strongest base?
a) $C_6H_5NH_2$
b) $p - NO_2 - C_6H_4NH_2$
c) $m - NO_2 - C_6H_4NH_2$
d) $C_6H_5CH_2CH_2$

55. Benzyl amine cannot be prepared by
a) $C_6H_5CONH_2 \xrightarrow[\text{ether}]{LiAlH_4}$
b) $C_6H_5CH_2CONH_2 + Br_2 + KOH \rightarrow$
c) $C_6H_5CN \xrightarrow{LiAlH_4}$
d) $C_6H_5CH_2NC \xrightarrow{LiAlH_4}$

56. Urea when heated a white residue is formed. Its alkaline solution when treated with few drops of $CuSO_4$ solution gives:

a) Red colour b) Violet colour c) Green colour d) Yellow colour

57. An organic compound '*A*' having molecular formula C_2H_3N on reduction gave another compound *B*, upon treatment with nitrous acid '*B*' gave ethyl alcohol. On warming with chloroform and alcoholic KOH, it formed an offensive smelling compound '*C*'. The compound '*C*' is
a) $CH_3CH_2NH_2$ b) $CH_3CH_2N{\equiv}C$ c) $CH_3C \equiv N$ d) $CH_3CH_2.OH$

58. What is '*Z*'in the following reaction ?

a) Benzoic acid b) Cyanobenzoic acid c) Benzamide d) Aniline

59. Amino group is *ortho/para*-directing for aromatic electrophilic substitution. On nitration of aniline, a good amount of *m*-nitroaniline is obtained. This is due to
a) In nitration mixture, *ortho, para*-activity of NH_2 group is completely lost
b) $-NH_2$ because $-NH_3^+$, which is m-directing
c) $-NH_2$ becomes $-NH^+SO_4^-$, which is *m*-directing
d) $-NH_2$ becomes $-NH^-NO_2^+$, which is *m*-directing

60. Carbonyl chloride reacts with ammonia to form:
a) CO_2 b) NH_2CONH_2 c) CH_3COONH_4 d) CH_3CONH_2

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AMINES

ANSWER KEY

31)	c	32)	b	33)	b	34)	b
35)	c	36)	a	37)	c	38)	d
39)	d	40)	b	41)	a	42)	b
43)	a	44)	a	45)	b	46)	d
47)	b	48)	c	49)	a	50)	d
51)	a	52)	b	53)	b	54)	b
55)	d	56)	b	57)	b	58)	d
59)	a	60)	b				

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AMINES

HINTS AND SOLUTIONS

31 **(c)**

$C_2H_5NH_2 + Na \longrightarrow C_2H_5NHNa + \frac{1}{2} H_2$

32 **(b)**

Only 1° aromatic amine (primary aromatic amine) from diazonium salts at low temperature ($0° - 5°C$). A reaction in which $-NH_2$ group is converted into diazo group $(-N^+ \equiv N)$ is called diazotization. Diazotized salts are stable in cold aqueous solution.

Amines, so undergo diazotization but $C_6H_5CH_2NH_2$ (aliphatic amine) will not undergo diazotisation.

33 **(b)**

Aniline is prepared by the reduction of nitrobenzene in acidic medium.

34 **(b)**

Amines possess fishy smell.

36 **(a)**

Electrons donors are bases. Greater the stabilisation of cation formed by loss of electron more will be basicity of amine.

2° amine is more basic than 3° amine because 2° amine is stabilized by hydrogen bonding with solvent molecule.

37 **(c)**

$RCONH_2 + NaOBr \rightarrow RNH_2 + NaBr + Na_2CO_3 + 2H_2O$
$'X'$

38 **(d)**

Benzyl amine $(C_6H_5CH_2NH_2)$ is more basic than aniline $(C_6H_5NH_2)$ because N-atom of aniline is delocalized over the benzene ring. However in benzyl amine the lone pair of electrons on the N-atom is not conjugated with the benzene ring and therefore it is not delocalized. Hence, the lone pair of electrons on the N-atom in benzyl amine is more readily available for protonation than that on the N-atom of aniline. Thus, the benzyl amine is a stronger base than aniline.

39 **(d)**

Tertiary amines react as,

$(CH_3)_3N + HNO_2 \longrightarrow (CH_3)_3NHNO_2$

41 **(a)**

Follow text.

44 **(a)**

$C_2H_5NC + H_2O \xrightarrow{H^+} \underset{\text{formic acid}}{HCOOH} + C_2H_5NH_2$

$C_2H_5NH_2 + H^+ \rightarrow \underset{\text{salt}}{C_2H_2NH_3^+}$

45 **(b)**

It gives diazonium salt.

It is known as diazotization reaction.

46 **(d)**

Aniline undergoes diazotisation.

47 **(b)**

$$R\text{CN} \xrightarrow{\text{Hydrolysis}} R\text{COOH} + \text{NH}_3$$

$$R\text{CH} = \text{NOH} \xrightarrow{\text{Reduction}} R\text{CH}_2\text{NH}_2 + \text{H}_2\text{O}$$

$$R\text{CN} + 2\text{H}_2\text{O} \xrightarrow{\Delta} R\text{NH}_2 + \text{HCOOH}$$

$$R\text{CONH}_2 \xrightarrow{\text{Hydrolysis}} R\text{COOH} + \text{NH}_3$$

49 **(a)**

Trimethyl amine is a tertiary amine. It dissolve in cold nitrous acid to form salts which decompose on warming to nitrosoamine and alcohol. It will not liberate nitrogen.

$$(\text{CH}_3)_3\text{N} + \text{HNO}_2 \rightarrow [(\text{CH}_3)_3\text{NH}]^+\text{NO}_2^-$$

trimethyl ammonium nitrite

51 **(a)**

Carbylamine reaction is given by aliphatic and aromatic primary amine hence, it can be used for the distinguish of primary amine with secondary and tertiary amine. In this reaction, a primary amine reacts with chloroform and alcoholic KOH to give poisonous substance isocyanide.

$$R\text{NH}_2 + \text{CHCI}_3 + 3\text{KOH(alc.)} \xrightarrow{\Delta} R\text{NC} + 3\text{KCI} + 3\text{H}_2\text{O}$$

Primary amine — alkyl isocyanide

52 **(b)**

Nitrobenzene is reduced by Zn and alcoholic KOH into hydrazobenzene.

$$2\text{C}_6\text{H}_5\text{NO}_2 + 10\text{H} \xrightarrow{\text{Zn+alc.KOH}} \text{C}_6\text{H}_5 - \text{NH} - \text{NH} - \text{C}_6\text{H}_5 + \text{H}_2\text{O}$$

hydrazobenzene

53 **(b)**

Electron withdrawing groups (*e.g.*, benzyl) because the basicity of amines. Electron donating groups (*e.g.*, alkyl) increase the acidity of amines.

∴ The correct order of basicity of amines is

$$\text{C}_2\text{H}_5\text{NH}_2 > C\text{H}_3\text{NH}_2 > N\text{H}_3 > \text{C}_6\text{H}_5\text{NH}_2$$

54 **(b)**

Aliphatic amines (in which amino group is attached with alkyl group) are more basic than aromatic amines (in which amino group is bonded directly with benzene nucleus). Hence, $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$ (benzyl amine), being an aliphatic amine, is the most basic among the given the compounds.

55 **(d)**

(a) $\text{C}_6\text{H}_5\text{CONH}_2 \xrightarrow[\text{ether}]{\text{LiAlH}_4} \text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$

Benzylamine

(b) $\text{C}_6\text{H}_5\text{CH}_2\text{CONH}_2 \xrightarrow{\text{Br}_2/\text{KOH}} \text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$

Benzylamine

(c) $\text{C}_6\text{H}_5\text{CN} \xrightarrow{\text{LiAlH}_4} \text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$

Benzylamine

(d) $\text{C}_6\text{H}_5\text{CH}_2\text{NC} \xrightarrow{\text{LiAlH}_4} \text{C}_6\text{H}_5\text{CH}_2\text{NHCH}_3$

2°amine

56 **(b)**

Biuret formed gives violet colour with CuSO_4 in alkaline medium.

57 **(b)**

$CH_3 - C \equiv N \xrightarrow{\text{Reduction}} CH_3CH_2NH_2 \xrightarrow{HONO} CH_3CH_2OH$

methyl cyanide — ethanamine — ethanol

1. *(B)*

$CH_3CH_2NH_2 \xrightarrow{CHCl_3,KOH} CH_3CH_2N \rightrightarrows C$

2. Ethyl isocyanide

(C)

58 **(d)**

$\therefore Z$ is aniline

59 **(a)**

On direct nitration of aniline, lone pair of electrons present at nitrogen atom will accept proton from the nitrating mixture to give anilium ion which is *meta* directing.