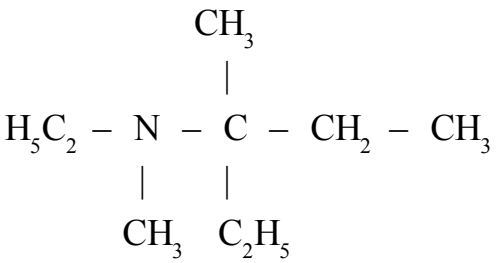
Unit-24 Organic Compound Containing Nitrogen

MCQ

1. Select the IUPAC name of the folloing :



(A) N - Methyl, N - Ethyl - 3 - Methyl - Pentan - 3 - amine

(B) N - Ethyl, N - Methyl - 3 - Ethyl - 3 - Methyl - propan - 1 - amine

(C) N - Ethyl, N - Methyl - 3 - Methyl - Pentan - 3 - amine

(D) N - Methyl, N - Ethyl - 3 - Methyl - 3 Ethyl - Propan - 1 - amine

2. Which of the Following reactions does not yield an amine ?

(A) $R-X+NH_3 \rightarrow$ (B) $R-CH=N.OH+[H] \xrightarrow[C_2H_5OH]{Na}$

(C) $R-CN+H_2O \xrightarrow{H^+}$ (D) $R-CONH_2 \xrightarrow{LiAlH_4}$

3. Which of the following amides will not undergo Hofmann bromamide reaction ?

(A) Ethanamide (B) Propanamide (C) Benzenamide (D) Acetanilide

4. Which of the following represents the poisonous gas which caused Bhopal tragedy in 1984 ?

(A) $CH_3-N=C=O$ (B) $CH_3-N=C=S$

(C) $CH_3-CH=N=S$ (D) $CH_3-O-N \rightleftharpoons S$

5. Choose the proer option for given statement on the basis of physical properties

Statement : (i) Alkyl isocyanides have bad odours while alkylcyanides have pleasant odours.

Statement : (ii) Alkyl cynanides are poisonous compounds.

Statement : (iii) The boling points of alkyl cyanides are lower than their isomeric alkyl-isocynides.

Statement : (iv) Acetonitrile is soluble in water but methylcarbylamine is not.

(A) TTTF (B) TFTF (C) TFFF (D) TFFT

6. Phenyl isocyanide is prepared by which of the Following reaction ?

(A) Hoffmann reaction (B) Carbylamine reaction

(C) Reimer-Tiemann reaction (D) Wurtz reaction

7. What is the end product (B) in the following reaction sequence ?

Butanamide $\xrightarrow[\Delta]{P_2O_5}$ A $\xrightarrow{LiAlH_4}$ B

(A) n - butylamine (B) n - propylcyanide

(C) Propyl isocyanide (D) n - Propylamine

8. Which of the following Structures represents a nitrolic acid ?

(A) $R_2C = N.OH$

(C) $R - \underset{\displaystyle NO_2}{\underset{|}{C}} = N.OH$

(B) $\begin{array}{l} R_2C - NO_2 \\ \quad | \\ \quad NO \end{array}$

(D) $R_2N - N = O$

9. Identify the compound "X" in the Following reactions.

$$CH_3NO_2 \xrightarrow[\text{excess}]{Cl_2 / NaOH} [\times] \xleftarrow{HNO_3} CHCl_3$$

(A) $ClCH_2NO_2$

(B) CH_3Cl

(C) $Cl_2CH\,NO_2$

(D) Cl_3CNO_2

10. Which of the following amines can not be Prepared by Gabriel - Phthalimide reaction ?

(A) Benzylamine

(B) Ethylamine

(C) Aniline

(D) Methylamine

11. In $(CH_3)_3N$ the state of hybridization of N-atom and the Spatial rearrangement of methyl groups around it are respectively.

(A) SP^3, Pyramidal

(B) SP^3, tetrahedral

(C) SP^2, trigonal planar

(D) SP^3, trigonal planar

12. Which of the following Compounds loses optical activity due to nitrogen inversion ?

(A) $CH_3CH_2 - \underset{\displaystyle NH_2}{\underset{|}{CH}} - CH_3$

(C) $CH_3CH_2 - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{N}} - CH_2CH_3$

(B) $CH_3CH_2 - \underset{\displaystyle OH}{\underset{|}{N}} - CH_2CH_3$ (D) $\left[CH_3CH_2 - \underset{\displaystyle CH_3}{\underset{|}{\overset{\displaystyle CH_2C_6H_5}{\overset{|}{N^+}}}} - CH_2 - CH = CH_2 \right] I^-$

13. The pKa Values of same bases are given below pick out the weakest base.

(A) 4.40

(B) 4.00

(C) 2.88

(D) 10.68

14. The correct order of increasing basicity in aqueous solution is.

(A) $NH_3 < C_6H_5NH_2 < (C_2H_5)_2NH < C_2H_5NH_2 < (C_2H_5)_3N$

(B) $C_6H_5NH_2 < NH_3 < (C_2H_5)_3N < C_2H_5NH_2 < (C_2H_5)_2NH$

(C) $C_6H_5NH_2 < NH_3 < C_2H_5NH_2 < (C_2H_5)_3N < (C_2H_5)_2NH$

(D) None of the above

15. The order of basic strength among the Following amines in the Vapour phase (non - aqueous) Solution is.

(A) $CH_3NH_2 > (CH_3)_3N > (CH_3)_2NH$

(B) $(CH_3)_3N > (CH_3)_2NH > CH_3NH_2$

(C) $CH_3NH_2 > (CH_3)_2NH > (CH_3)_3N$

(D) $(CH_3)_3N > CH_3NH_2 > (CH_3)_2NH$

16. Dye test can be used to distinguish between

(A) Ethylamine and acetamide (B) Ethylamine and aniline

(C) Urea and acetamide (D) Methylamine and Ethylamine

17. Identify 'Z' in the sequence.

$$C_6H_5NH_2 \xrightarrow[273K]{NaNO_2+HCl} \boxed{x} \xrightarrow{CuCN/KCN} \boxed{y} \xrightarrow[Boil]{H^+/H_2O} \boxed{z}$$

(A) C_6H_5CN (B) $C_6H_5CONH_2$

(C) C_6H_5COOH (D) $C_6H_5CH_2NH_2$

18. Which of the following arylamines is most difficult to diazotize ?

(A) O_2N–C$_6$H$_4$–NH_2 (B) CH_3O–C$_6$H$_4$–NH_2

(C) Cl–C$_6$H$_4$–NH_2 (D) CH_3–C$_6$H$_4$–NH_2

19. Deamination of benzenediazonium chloride can be carried out with

(A) H_3PO_3 (B) H_3PO_4

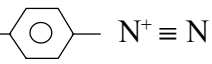
(C) H_3PO_2 (D) HPO_3

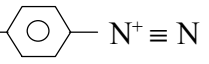
20. Which prouduct will be obtained by the hydrolysis of the product obtained by reaction of butane - nitrile with Ethyl magnesium bromide ?

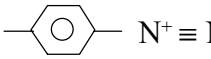
(A) Ethyl - n - propyl ether (B) Ethoxy propane

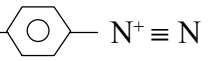
(C) Ethyl propanoate (D) Hexan - 3 - One

21. Which of the following daizonium salts when boiled with dil. H_2SO_4 gives the corresponding phenol most difficult ?

(A) HO_3S  $N^+ \equiv N$

(B) CH_3  $N^+ \equiv N$

(C) Br  $N^+ \equiv N$

(D) CH_3O  $N^+ \equiv N$

22. Arrange the following amines in order of increasing basicity n - pentylamine (I), Sec-pentyl amine (II), iso - pentylamine (III), tert - pentylamine (IV).

(A) I < II < III < IV (B) II < III < I < IV

(C) IV < III < II < I (D) III < IV < I < II

23. Match the entries of column - I with appro priate entries of column - II and choose the correct option.

Column - I (Amine)	- Cloumn - II $({}_pK_a$ Value)
(A) Benzenamine	- (P) 11.0
(B) N - Methyl aniline	- (q) 5.08
(C) N, N - di Methylaniline	- (r) 4.30
(D) N - Ethyleethanamine	- (s) 4.62

(A) A-P, B-q, C-r, D-S (B) A-q, B-p, C-r, D-s

(C) A-S, B-P, C-q, D-r (D) A-S, B-r, C-q, D-P

24. Which of the following statement is correct ?

(A) P - nitroaniline is a stronger base than aniline.

(B) Aniline is a weaker base than O-methoxyanline

(C) P - methoxy aniline is a weaker base than aniline

(D) Aniline is a weaker base than ethylamine

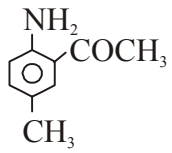
25. Benzylamine may be preared by.....

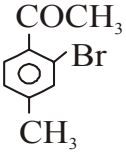
(A) $C_6H_5CONH_2 \xrightarrow{LiAlH_4 / ether}$ (B) $C_6H_5CN \xrightarrow{LiAlH_4 / ether}$

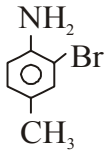
(C) Phthalimide $\xrightarrow[(iii)\ Aq\ NaOH\ \Delta]{(i)\ KOH\ (ii)\ C_6H_5CH_2\ Br}$ (D) All of the above

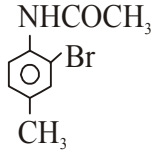
26. P-toludine $\xrightarrow{AC_2O}$ (A) $\xrightarrow[CH_3COOH]{Br_2}$ (B) $\xrightarrow[H^+]{H_2O}$ (C)

What would be (C) for the reaction.

(A) 

(B) 

(C) 

(D) 

27. The correct order of decreasing basic nature for the bases NH_3, CH_3NH_2 and $(CH_3)NH$ is....

(A) $CH_3NH_2 > (CH_3)_2NH > NH_3$ (B) $(CH_3)_2NH > NH_3 > CH_3NH_2$

(C) $CH_3NH_2 > NH_3 > (CH_3)_2NH$ (D) $NH_3 > CH_3NH_2 > (CH_3)_2NH$

28. When a primary amine reacts with chloroform in ethanolic KOH, then the product is.....

(A) an isocyanide (B) an aldehyde

(C) a Cyanide (D) an alcohol

29. In the following sequence of reactions, what are suitable for (A) and (B) when (D) is 1 - phenyl propan - 1 - one.

$\boxed{A}$ ₹ $\boxed{B} \rightarrow [\boxed{C}] \xrightarrow[+H_2O/H^+]{Hydrolysis} \boxed{D} + Mg(NH_2)Br$

(A) $A = C_6H_5C \equiv N$, $B = CH_3CH_2MgBr$

(B) $A = C_6H_5CONH_2$, $B = CH_3CH_2MgBr$

(C) $A = CH_3CH_2 - C \equiv N$, $B = C_6H_5MgBr$

(D) both (a) and (c)

30. Inter molecular hydrogen bonding is strongest in

(A) Methylamine (B) Phenol

(C) Methanal (D) Methanol

31. Among the following dissociation constant is highest for

(A) C_6H_5OH (B) $CH_3NH_3^+ Cl^-$

(C) $CH_3 - C \equiv CH$ (D) $C_6H_5CH_2OH$

Each question given below contains statement - 1 (Assertion) and Statement - 2 (Reason). Each queastion has 4 choices (a), (b), (c) and (d). out of which only one is correct choose the correct option as under :

(A) Statement - 1 is True; Statement - 2 is True ;
Statement - 2 is a correct explanation for Statement - 1

(B) Statement - 1 is True; Statement - 2 is True;
Statement - 2 is Not a correct explanation for
Statement - 1

(C) Statement - 1 is True; Statement - 2 is False

(D) Statement - 1 is False; Statement - 2 is True.

32. Statement - 1
Aniline is less basic than P - toludine.
Statement - 2
P - toludine is more basic than Aniline due to electron donating group - CH_3.

33. Statement - 1

Aniline on reaction with at $NaNO_2$/HCl 273K following by coupling with β-naphthol gives a dark red coloured precipitate.

Statement - 2

The colour of the compound formed in the reaction of aniline with $NaNO_2$/HCl at 273K followed by coupling with β-napthol is due to the extended conjugation.

34. Statement - 1

Primary aliphatic amine forms highly stable alkyl diazonium salt.

Statement - 2

Benzenediazonium chloride is easily soluble in water while Benzene diazonium fluoroborate is insolubel in water.

35. Statement - 1

Aniline is a weaker base than ammonia

Statement - 2

Aniline is resonance stabilized.

36. Statement - 1

P - nitro anline is a weaker base than p-toludine

Statement - 2

The electron with drawing - NO_2 group in P-nitroaniline makes it a stronger base.

37. Statement - 1

"Benzonitrile can not be prepared by nucleophilic substitution of benzene".

Statement - 2

" Benzonitrile can be easily prepared via diazonium salt".

38. Statement - 1

" Carboxylic acids are obtained by hydrolysis of Cyanide compounds in presence of sulphyric acid and ammonia is liberated."

Statement - 2

" Primary amine is obtained by reduction of cyanide compound in presence of $LiAlH_4$."

39. Statement - 1

"Gabriel Synthesis is used in the preparation of primary alifatic amines."

Statement - 2

"Primary aromatic amine can be prepared by Gabriel synthesis's method."

40. Statement - 1

" The boiling points of alkyl isocyanides are lower than their isomeric alkyl cyanides."

Statement - 2

"Isocyanide group is polar, so its boiling points is higher than their isomeric alkyl cyanides."

41. An organic compound (A) on reduction gives compound (B) on treatment with $CHCl_3$ and alcoholic KOH gives (C) on Catalytic reduction gives N - Methyl aniline. The compound (A) is.....

(A) Methylamine (B) Aniline (C) Nitrobenzene (D) Nitro methane

42. Which is formed when $(CH_3)_4 - N - OH$ is heated ?

(A) CH_3NH_2 (B) $C_2H_5NH_2$

(C) $(CH_3)_3N$ (D) $(CH_3)_2NH$

43. Aniline first react with acetyl chloride producing "A". "A" reacts with nitric acid / sulphuric acid mixure and produce compound "B", which hydrolyses to compound "C" what is the identity of "C" ?

(A) Acetanilide (B) P - nitro aniline

(C) P - Nitroacetanilide (D) Sulphanilic acid

44. Statement : (1) Sulphonation of aniline with conc. H_2SO_4 at 455 - 475 gives sulphanilic acid

Statement : (2) Sulphanilic acid exists as a zwitterion and is amphoteric in nature.

Statement : (3) Sulphanilic acid has high melting point and is practically insolube in water, acidic solutions and organic solvents.

Choose the proper option for above statement. (T = True, F = False)

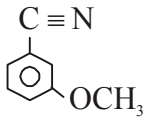
(A) TFT (B) TFF

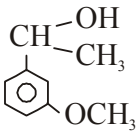
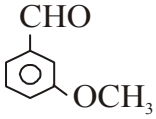
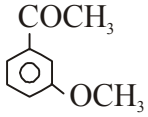
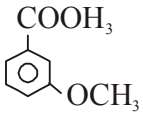
(C) FTF (D) TTT

45. Which of the following reactant produced Benzanilide when it treated with aniline ?

(A) Acetic anhydride (B) Benzenamide

(C) Acetyl chloride (D) Benzoyl choride

46.  $+ CH_3MgBr \rightarrow \boxed{Q} \xrightarrow{H_3O^+} \boxed{P}$ The procut "P" in the above reaction is .....

(A)  (B)  (C)  (D) 

47. Which of the following is the strongest base in aqueous solution ?

(A) Methylamine (B) Aniline

(C) Trimethylamine (D) Dimethylamine

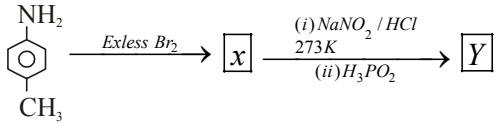
48. Identify (x) for the following reaction.

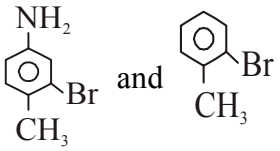
Benzonitrile $\xrightarrow[\substack{(ii)\,NaNO_2/HCl \\ 273K \\ (iii)\,H_2O}]{(i)\,Sn/HCl} \boxed{x}$

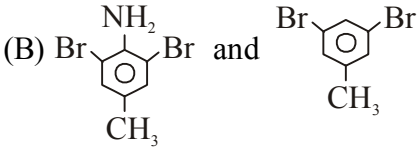
(A) Toluene (B) Benzyl alcohol

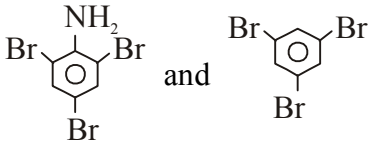
(C) Benzaldehyde (D) Benzene diazonium chloride

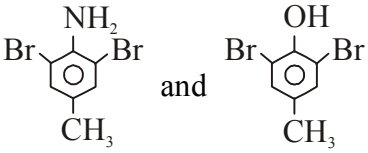
49. In the following reaction sequence, predict the compound (x) and (y).



(A)  and

(B)  and

(C)  and

(D)  and

50. How many primary amines are possibile with the formula of $C_4H_{11}N$?

(A) 1 (B) 2 (C) 3 (D) 4

51. Which of the following is not the correct reaction of aryldiazonium salts ?

(A) $C_6H_5N_2^+Cl^- + CuCl \xrightarrow{HCl} C_6H_5Cl$

(B) $C_6H_5N_2^+Cl^- + HBF_4 \xrightarrow{\Delta} C_6H_5F$

(C) $C_6H_5N_2^+Cl^- + H_3PO_2 \longrightarrow C_6H_5PO_4$

(D) $C_6H_5N_2^+Cl^- + SnCl_2 / HCl \longrightarrow C_6H_5NHNH_2$

52. No. of σ and π bonds contains Allyl isocyanide are _____ and _____

(A) 9σ and 3π (B) 9σ and 9π

(C) 3σ and 4π (D) 5σ and 7π

53. Identify (A), (B), and (C) for the given reaction.

Ethane nitrile

(A) A = Ethanol, B = Ethanal, C = Ethanoic acid

(B) A = Ethylamine, B = Ethanol, C = Ethanal

(C) A = Ethanamide, B = Ethanol, C = Ethanal

(D) A = Ethanoic acid, B = Ethanol, C = Ethanal

54. Gas evolved during the reaction of Na-metal on $C_2H_5NH_2$ is :

(A) N_2 (B) H_2 (C) C_2H_2 (D) CO_2

55. When primary amine is heated with CS_2 in presence of excess of $HgCl_2$, it gives isocyanate The reaction is called :

(A) Hoffmann's bromamide reaction (B) Perkin's reaction

(C) Hoffmann's mustard oil reaction (D) Carbylamine reaction

56. Which of the reactions will not give a primary amine ?

(A) Acetamide $\xrightarrow[KOH]{Br_2}$ (B) Ethanenitrile $\xrightarrow{LiAlH_4}$

(C) Methyl isocyanide $\xrightarrow{LiAlH_4}$ (D) Acetamide $\xrightarrow{LiAlH_4}$

57. The IUPAC name for

$$CH_3 - CH = CH - CH_2 - \underset{\displaystyle NH_2}{\underset{|}{CH}} - CH_2 \cdot COOH$$

(A) 5 - amino - 2 - heptenoic acid (B) 3 - amino - hept - 5 - enoic acid

(C) 5 - amino - hex - 2 - ene - carboxylic acid (D) β - amino - 8 - heptenoic acid

58. The action of nitrous acid on an aliphatic primary amine, gives : _____

(A) alcohol (B) alkyl nitrite

(C) secondary amine (D) nitro alkane

59. How many isomeric amines with formula C_3H_9N are possible ?

(A) 2 (B) 3 (C) 4 (D) 5

60. Which one of the following methods is neither meant for the synthesis nor for separation of amines ?

(A) Hinsberg method (B) Carbyl amine method

(C) Hofmann method (D) Wurtz reaction

61. Which of the following is not correct ?

(A) Ethylamine and aniline both have NH_2 group.

(B) Ethylamine and aniline both dissolve in HCl.

(C) Ethylamine and aniline both react with HNO_2 to give hydroxy compounds.

(D) Ethylamine and aniline both react with $CHCl_3$ and KOH to form unpleasant smell.

62. Which is most basic ?

(A) Aniline (B) O-Nitroaniline

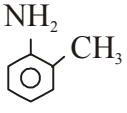
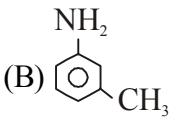
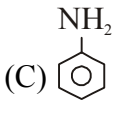
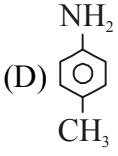
(C) p-nitro aniline (D) m-nitro aniline

63. Gabriel phthalimide reaction is used for the preparation of

(A) 1^0 aromatic amine (B) 1^0 aliphatic amine

(C) 2^0 aliphatic amine (D) 2^0 aromatic amin

64. Which is most basic ?

(A)  (B)  (C)  (D) 

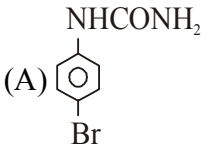
65. Which is most versatile compound in the synthesis of aromatic compounts ?

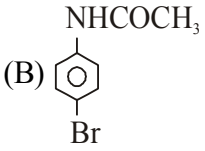
(A) benzene diazonium chloride (B) nitro benzene

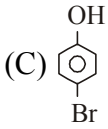
(C) $C_6H_5CONH_2$ (D) C_6H_5Cl

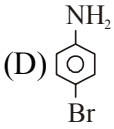
66. Identify : C for the following reaction

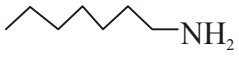
$C_6H_5NH_2 \xrightarrow{AC_2O} \boxed{A} \xrightarrow{Br_2} \boxed{B} \xrightarrow{H^+/H_2O} \boxed{C}$

(A) 

(B) 

(C) 

(D) 

67. Name the amide which on reduction gives. 

(A) Hexanamide (B) Pentanamide

(C) Heptanamide (D) Butanamide

68. Identify A, B, C and D in the following reactions :

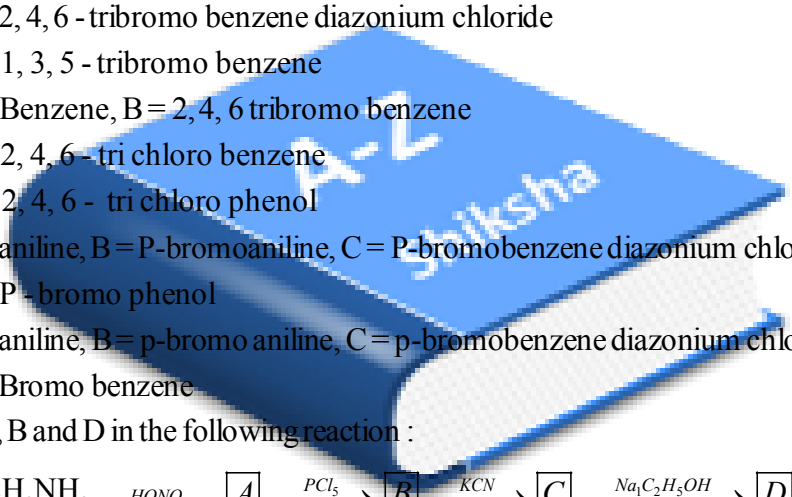
Nitrobenzene $\xrightarrow{Sn/HCl} \boxed{A} \xrightarrow[\text{Excess}]{Br_2} \boxed{B} \xrightarrow[273K]{NaNO_2/HCl} \boxed{C} \xrightarrow{H_3PO_2/H_2O} \boxed{D}$

(A) A = aniline, B = 2, 4, 6 - Tribromoniline,
C = 2, 4, 6 - tribromo benzene diazonium chloride
D = 1, 3, 5 - tribromo benzene

(B) A = Benzene, B = 2, 4, 6 tribromo benzene
C = 2, 4, 6 - tri chloro benzene
D = 2, 4, 6 - tri chloro phenol

(C) A = aniline, B = P-bromoaniline, C = P-bromobenzene diazonium chloride.
D = P - bromo phenol

(D) A = aniline, B = p-bromo aniline, C = p-bromobenzene diazonium chloride.
D = Bromo benzene



69. Identify A, B and D in the following reaction :

$CH_3CH_2CH_2NH_2 \xrightarrow{HONO} \boxed{A} \xrightarrow{PCl_5} \boxed{B} \xrightarrow{KCN} \boxed{C} \xrightarrow{Na,C_2H_5OH} \boxed{D}$

(A) $[A] = CH_3CHO$, $[B] = CH_3Cl$, $[D] = CH_3CH_2NH_2$

(B) $[A] = CH_3CH_2OH$, $[B] = CH_3CH_2Cl$, $[D] = CH_3CH_2CH_2NH_2$

(C) $[A] = CH_3CH_2CH_2OH$, $[B] = CH_3CH_2CH_2Cl$, $[D] = CH_3CH_2CH_2CH_2NH_2$

(D) $[A] = CH_3CHO$, $[B] = CH_3CH_2Cl$, $[D] = CH_3CH_2CH_2NH_2$

70. Out of the following compounds, which is the most basic ?

(A) CH_3NH_2 (B) $(CH_3)_2NH$

(C) $(CH_3)_3N$ (D) CH_5NH_2

71. Aniline on oxidation with $Na_2Cr_2O_7$ and H_2SO_4 gives.....

(A) benzoic acid (B) m-amino benzoic acid

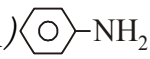
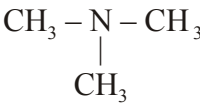
(C) p-benzo quinone (D) schiff's base

72. Hinsberg's reagent is .....

(A) benzene sulphonyl chloride (B) benzene sulphonic acid

(C) phenyl isocynide (D) benzene sulphonamide

73. Gabrid phthalimide reaction is used for the preparation of .....

(A)  (B) CH_3-NH-CH_3 (C)  (D) 

74. The number of possible structures of amines (C_7H_9N) having one benzene ring is.....

(A) 3 (B) 4 (C) 5 (D) 6

75. Number of primary amines of the formula $C_4H_{11}N$ is .....

(A) 1 (B) 2 (C) 4 (D) 3

76. The reagents needed to convert is/are : Benzenamide → Acetanilide

(A) KOH/Br_2, $LiAlH_4$ (B) KOH/Br_2, CH_3COCl

(C) HONO, Cu_2Cl_2, $(CH_3CO)_2O$ (D) KOH/Br_2, Ni/H_2, CH_3COCl

77. The compound $C_5H_{13}N$ is optically active and reacts with HNO_2 to give $C_5H_{11}OH$. The command is

(A) N-methylbutanamine (B) 1-amino pentane

(C) 2-Amino pentane (D) N, N-Dimethyl propanamine

78. The amine which does not react with Acetyl chloride is

(A) CH_3NH_2 (B) $(CH_3)_2NH$

(C) $(CH_3)_3N$ (D) None of the above

79. Among the following, the strongest base is : _____

(A) Aniline (B) P-nitro aniline

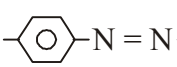
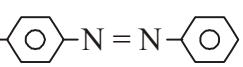
(C) m-nitro aniline (D) Benzyl amine

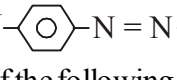
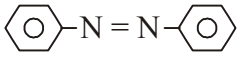
80. Chloro ethane $\xrightarrow{NaCN}$ $\boxed{x}$ $\xrightarrow{Ni/H_2}$ $\boxed{y}$ $\xrightarrow{(CH_3CO)_2O}$ $\boxed{z}$ Z in the above sequence is.....

(A) $CH_3CH_2CH_2NHCOCH_3$ (B) $CH_3CH_2CH_2NH_2$

(C) $CH_3CH_2CH_2CONHCH_3$ (D) $CH_3CH_2CH_2CONHCOCH_3$

81. Aniline when diazotized in cold and then treated with Aniline gives a coloure product, Its structure would be.....

(A) CH_3-  (B) H_2N- 

(C) H_2N-  7 (D) 

82. Which of the following is the strongest base ?

(A) 0-methyl aniline (B) Aniline

(C) N-methyl aniline (D) Benzylamine

83. Identity the product in the following sequence :

3, 4, 5 - Tri bromo aniline $\xrightarrow[\text{(ii) } H_3PO_2]{\text{(i) Diazotisation}}$

(A) 3, 4, 5 - Tribromo benzene (B) 3, 4, 5 - Tribromo phenol

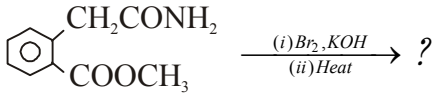
(C) 1, 2, 3 - Tribromo benzene (D) 1, 2, 6 - Tribromo phenol

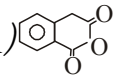
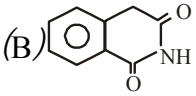
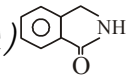
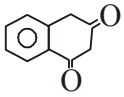
84. Aromatic nitriles (ArCN) are not prepared by the reaction :

(A) Ar X + KCN (B) ArN^+_2Cl + CuCN

(C) $ArCONH_2 + P_2O_5$ (D) $ArCONH_2 + SOCl_2$

85. The Following sequence of reactions on A gives



(A)  (B)  (C)  (D) 

86. Presence of a nitro group in a benzene ring _____

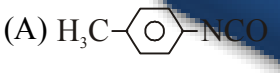
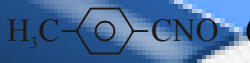
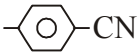
(A) renders the ring basic

(B) deactivates the ring towards nucleophilic substitution

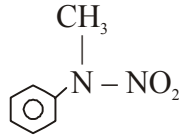
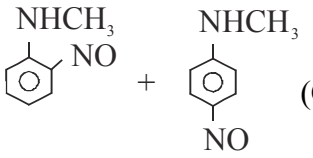
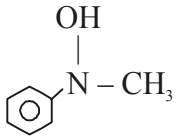
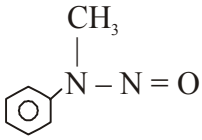
(C) deactiveates the ring towards electrophilic substitution

(D) activates the ring towards electrophilic substitution

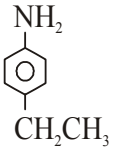
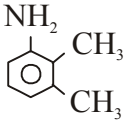
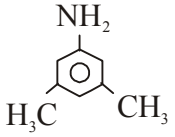
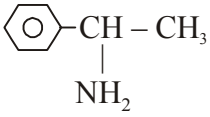
87. The reaction of $CHCl_3$ and alcoholic KOH with p-toluidine gives.

(A)  (B)  (C)  (D) 

88. Predict the product :

(A)  (B)  (C)  (D) 

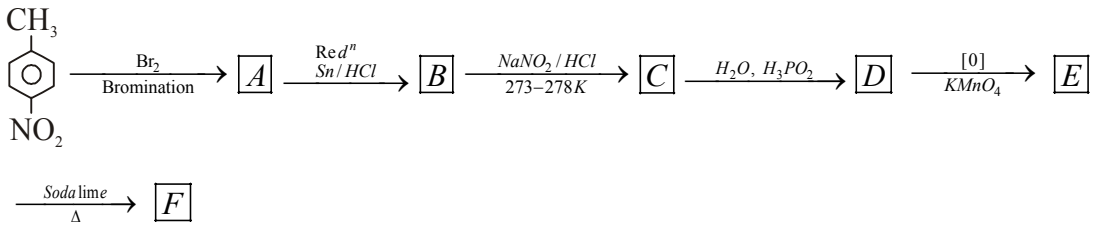
89. Suggst a structural formula of a compound having molecular $C_8H_{11}N(A)$ Which is optically active dissolves in dil aqueous HCl and releases N_2 with Nitrous acid.

(A)  (B)  (C)  (D) 

90. Which is the oxidised product of when benzene diazonium chloride treated with hypo phyosphrous acid ?

(A) H_3PO_4 (B) H_3PO_3 (C) $H_4P_2O_7$ (D) None of this

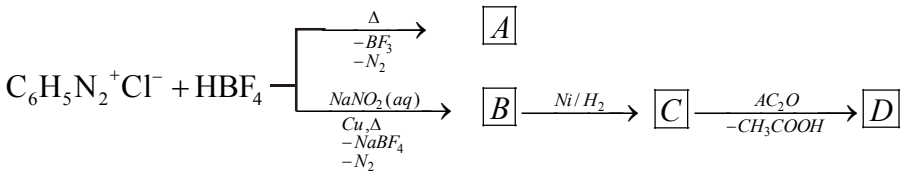
91. Identify (F) from the following reaction :



(A) Benzene (C) Bromobenzene

(B) 1,2-dibromobenzene (D) 1,-2 - dibromobenzoic Acid

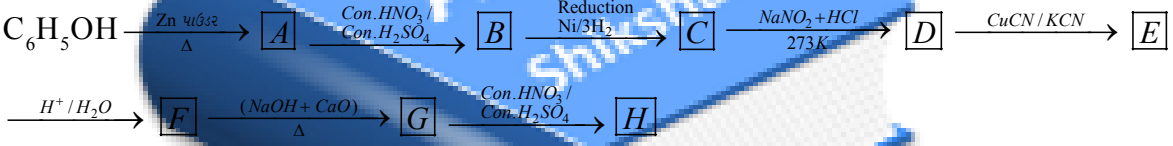
92. Give the IUPAC name of product (A) and (D) respectively.



(A) Benzene, Acetanilide (B) Fluorobenzene, Acetanilide

(C) Toluene, N - acetyl benzenamine (D) Fluoro benzene, Ethanmide

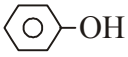
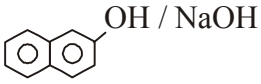
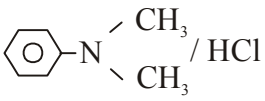
93. Which of the poroducts are same in the following reaction ?



(A) (A) and (G) (B) (B) and (H)

(C) (C) and (G) (D) both (a) and (b)

94. When benzenediazonium chloride react with substance of column-1 it gives coloured product given in column-II select proper option from the following.

Column - I	**Column - II**
(A) 	(P) P - amino azobenzene
(B) 	(Q) P - N - N - dimethylamino - azobenzene
(C) 	(R) P - hydroxy azobenzene
(D) 	(S) β - Napthyl azobenzene

(A) A – P, B – Q, C – R, D – S (C) A – Q, B – P, C – R, D – S

(B) A – R, B – S, C – A, D – Q (D) A – S, B – Q, C – P, D – R

95. Which of the following compunds is not prepared by sandmeyer's reaction ?

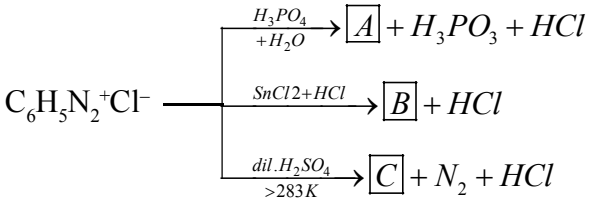
(A) Chloro benzene (B) Bromobenzene (C) Benzene nitrile (D) Iodobenzene

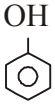
96. Which of the following subsance gives reaction with benzene sulphonyl chloride ?

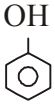
(A) N, N - Dimethyl ethanamine (C) Methyl ethylamine

(B) Trimethylamine (D) Dimethyl ethyl amine

97. Identify, (A), (B) and (C) for the reaction given :



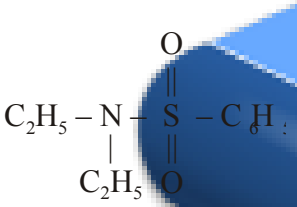
(A) A =  , B =  , C = 

(B) A =  , B =  , C = 

(C) A =  , B =  , C = 

(D) A =  , B =  , C = 

98. Select the IUPAC name of the following :



(A) N, N-diethyl benzene sulphonyl amine (B) N, N- deithyl -Phenyl sulphonamide

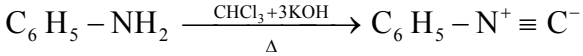
(C) N,N- diethyl benzene sulphonamide (D) N,N-diethyl benzene thionyl amine

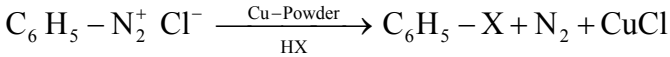
99. Which of the following is least basic ?

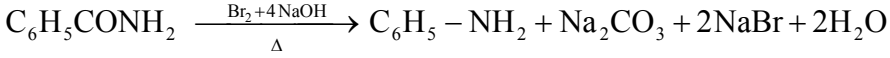
(A)  (B) (C) (D)

100. Which of the following reactions is known as "Balz-Schiemann reaction"?

(A)

(B) 

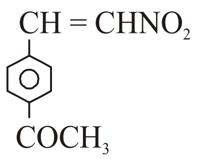
(C) 

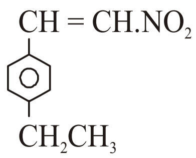
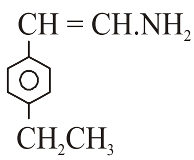
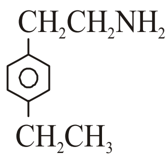
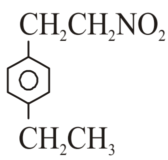
(D) 

101. Which has highest Kb value? $R = CH_3$

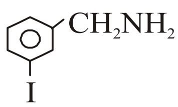
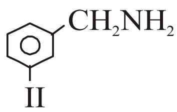
(A) R_2NH (B) R_3N

(C) $R - NH_2$ (D) NH_3

102.  $\xrightarrow[HCl]{Zn/Hg}$ Product. Here the product is

(A) 
(B) 
(C) 
(D) 

103. Which of the following statement is true regarding the basicity of the following two primary amines ?

(A) Both are equally basic because both are 1^0 amies
(B) I > II because it is an aromatic amine
(C) II > I because it is an aliphatic amine
(D) I < II because of difference in the nature of B-carbon

104. $R-\overset{\overset{\Large O}{\|}}{C}-\ddot{C}H-\overset{+}{N}\equiv \ddot{N} \rightarrow$ Intermediate + N_2

What is the nature of its intermediate in this reaction ?

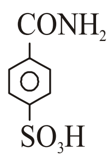
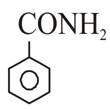
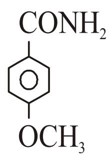
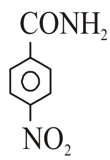
(A) Carboniumion (B) Carbanion
(C) Carbene (D) Freeradical

105. Identify (D) in the given reaction.

$CH_3COOH \xrightarrow[\text{(ii) } PBr_3]{\text{(i) } LiAlH_4} [A] \xrightarrow[\text{(ii) } LiAlH_4]{\text{(i) } KCN} [B] \xrightarrow{CHCl_3/OH^-} [C] \xrightarrow{LiAlH_4}$

(A) CH_3CH_2OH (B) $CH_3CH_2CH_2NHCH_3$
(C) $CH_3CH_2CH_2NH_2$ (D) $CH_3\ CH_2\ CH_2\ COOH$

106. Which of the following can undergo Hofmann reaction most easily ?

(A) 
(B) 
(C) 
(D) 

107. Which of the following name is correct for $CH_2=CH-CN$?

(A) Acrylonitrile (B) Vinyl Cyanide
(C) Prop - 2 -ene nitnle (D) All are correct

108. Which of the following is the correct IUPAC name of CH_3NC?

(A) Methyl isocyanide
(B) ethane isonitrile
(C) Methyl carbylamine
(D) both (a) and (c)

ANWER KEY

1.c	2.c	3.d	4.a
5.d	6.b	7.a	8.c
9.d	10.C	11.a	12.c
13.c	14.c	15.b	16.b
17.c	18.a	19.c	20.d
21.a	22.c	23.d	24.d
25.d	26.c	27.d	28.a
29.d	30.d	31.b	32.a
33.c	34.d	35.b	36.c
37.b	38.b	39.c	40.a
41.c	42.c	43.b	44.d
45.d	46.c	47.d	48.b
49.b	50.d	51.c	52.a
53.a	54.b	55.b	56.c
57.b	58.a	59.c	60.d
61.c	62.a	63.b	64.d
65.a	66.d	67.a	68.a
69.c	70.b	71.c	72.a
73.c	74.c	75.c	76.b
77.c	78.c	79.d	80a
81.b	82.d	83.c	84.a
85.c	86.c	87.c	88.d
89.d	90.b	91.c	92.d
93.d	94.b	95.d	96.c
97.a	98.c	99.c	100.a
101.a	102.b	103.d	104.c
105.b	106.c	107.d	108.d

Hints

8. $R\text{-}CH_2NO_2 \xrightarrow[-H_2O]{HONO} R-\underset{\underset{NOH}{||}}{C}-NO_2$

Nitro Compound

Nitrolic acid

9. CCl_3NO_2 Known as "Chloropicrin" (X)

10. Primary aromatic amine can not be prepared by this method because nucleophile aryl halide, does not become favouable anion for phthalimide.

12. Due to nitrogen inversion 3^o – amines with three different alkyl groups undergo racemization hence lose optical activity i.e, option (C) is correct.

13. Higher value of K_b (or lower value of $_pK_b$) Shows more basicity of amine.

$_pKa + {}_pKb = 14$ $\qquad$ $_pKb = -\log Kb$

For,

option (C) $_pK_b = 2.88$ hence, $_pK_b = 14 - 2.88$

$_pKb = 11.12$

14. $C_6H_5NH_2$ is weaker than NH_3 and basicity of amines in aqueous sloution is $2^\circ > 3^o > 1^o$

15. In non aqueous solvents the base strength increases as the magnitude of + 1 - effect increases, $3^\circ > 2^o > 1^o$

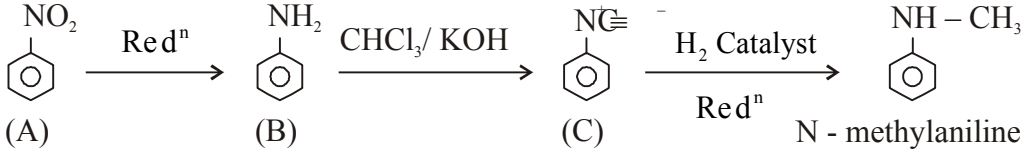
16. Only aromatic primary amines gives dye test.

18. Due to strong electron -withdrawing effect of the $-NO_2$ group, the nucleophilicity of the $-NH_2$ is reduced and hence diazotisation becomes difficult.

21. Aromatic 1^o amines containing electron donating groups at O- and P- positions undergo diazotisation much more readily than aniline while those containing electron with drawing groups such as $-NO_2, -SO_3H, -COOH$, etc.are difficult to diazotise.

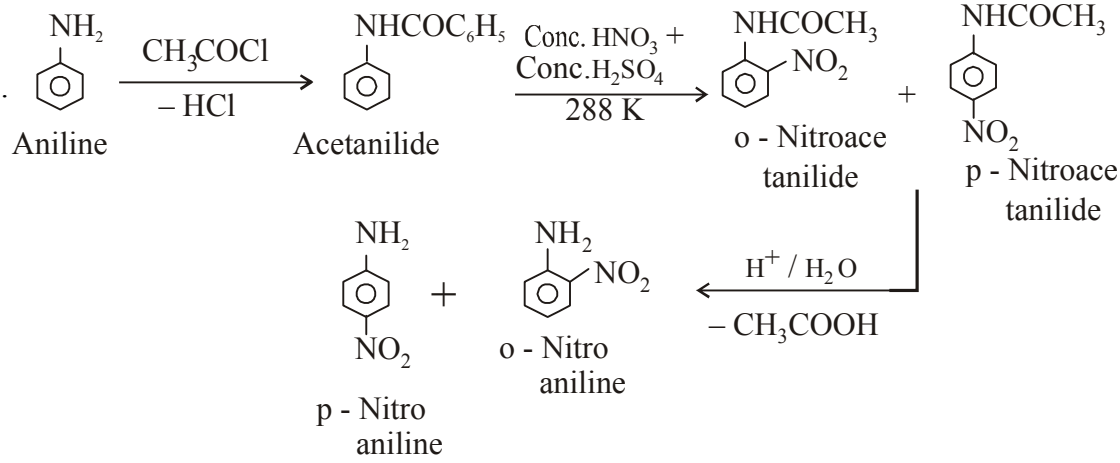
22. As the steric hindrance increases from $(I) + (IV)$ the basicity decreases, so, increasing order of basicity becomes IV < III < II < I.

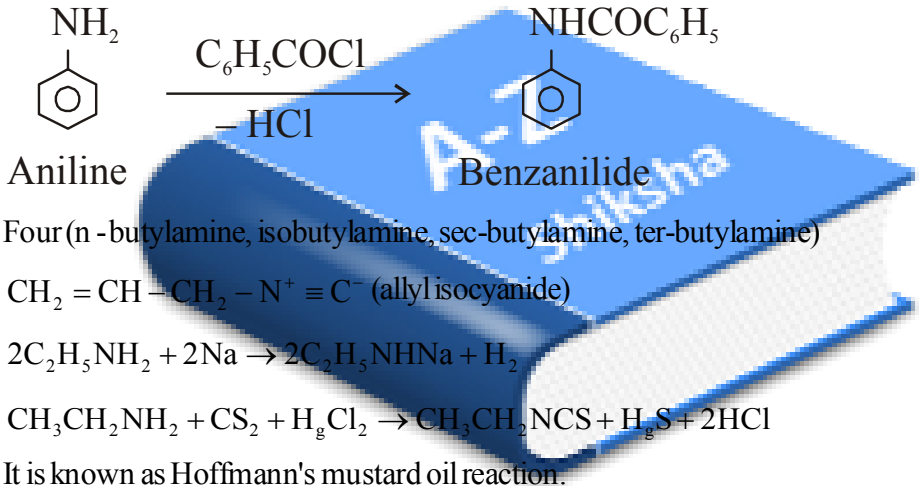
31. $CH_3NH_3^+ Cl^-$ being a salt, undergoes almost complete dissociation, therefore, it has a high dissociation constant.

41. 

(A) Nitrobenzene $\qquad$ (B) $\qquad$ (C) $\qquad$ N - methylaniline

42. $(CH_3)_4 . N. OH \xrightarrow{\Delta} [(CH_3)_3\ N] + CH_3OH$

43. 

45. 

50. Four (n - butylamine, isobutylamine, sec-butylamine, ter-butylamine)

52. $CH_2 = CH - CH_2 - N^+ \equiv C^-$ (allyl isocyanide)

54. $2C_2H_5NH_2 + 2Na \rightarrow 2C_2H_5NHNa + H_2$

55. $CH_3CH_2NH_2 + CS_2 + H_gCl_2 \rightarrow CH_3CH_2NCS + H_gS + 2HCl$

It is known as Hoffmann's mustard oil reaction.

56. CH_3NC on reduction will give a secondary amine.

58. $R - NH_2 + HNO_2 \rightarrow R - OH + N_2 + H_2O$

Aliphatic amine Alcohol

59. (i) $CH_3CH_2CH_2NH_2$ (ii) $CH_3 - \underset{\underset{NH_2}{|}}{CH} - CH_3$ (iii) $C_2H_5 - NH - CH_3$

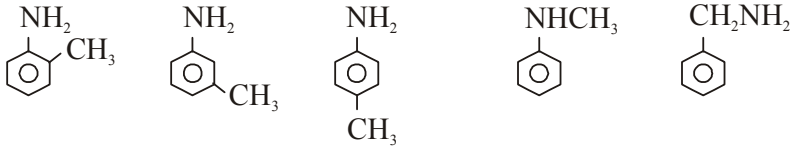
Propan -1-amine Propan - 2 - amine N-mthyl ethanamine

(iv) $(CH_3)_3N$

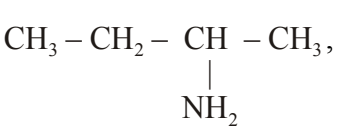
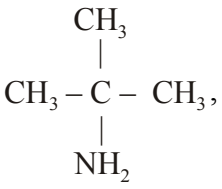
N, N - dimethyl Methanamine

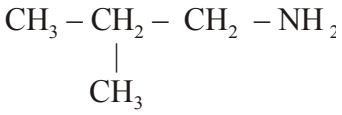
62. $-NO_2$,group is electron with drawing group.

73. Gabriel phthalimide reaction is used for the preparation of primary aliphatic amines only.

74. 

(i) (ii) (iii) (iv) (v)

75. $CH_3CH_2CH_2CH_2NH_2$,  , 



(i) (ii) (iii) (iv)

77. It has chiral carbon

So, it is optically active.

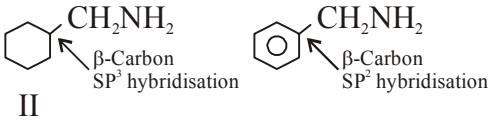
78. 3^o – amines do not react with acetyl chloride because they do not have replaceable H atom.

79. Benzylamine is stranger base because the lone pair on N atom is not de localised over the benzene ring.

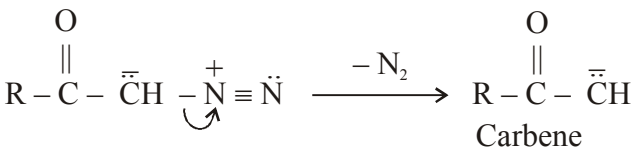
88. Secondary aliphatic and aromatic amines react with nitrous acid to form N - nitroso amine.

102. Amalgamated Zn and HCl reduces carbonyl group to methylene group without affecting double bond.

So, (b) option is correct $\left\{\begin{array}{l} -Co \rightarrow -CH_2- \\ -NO_2 \rightarrow -NH_2 \end{array}\right\}$

103. 

II

104. 

Carbene

106. $-OCH_3$ is more electron - releasing hence when the migrating aryl group has $-OCH_3$ in the para position, its migrated is accelerated.