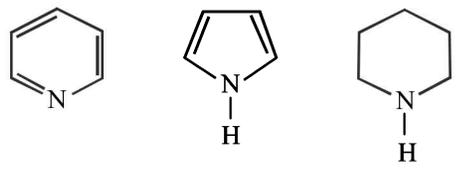
27 Amines

Conceptual MCQs

1. Arrange the following amines in the decreasing order of basicity :



I II III

(a) I > II > III (b) III > I > II
(c) III > II > I (d) I > III > II

2. Ortho-Nitrophenol is less soluble in water than *p*- and *m*- Nitrophenols because :
(a) *o*-Nitrophenol is more volatile than those of *m*- and *p*-isomers.
(b) *o*-Nitrophenol shows intramolecular H-bonding.
(c) *o*-Nitrophenol shows intermolecular H-bonding.
(d) Melting point of *o*-Nitrophenol is lower than those of *m*- and *p*-isomers.

3. When aniline reacts with oil of bitter almonds (C_6H_5CHO) condensation takes place and benzal derivative is formed. This is known as :
(a) Million's base (b) Schiff's reagent
(c) Schiff's base (d) Benedict's reagent

4. On heating an aliphatic primary amine with chloroform and ethanolic potassium hydroxide, the organic compound formed is:
(a) an alkanol (b) an alkanediol
(c) an alkyl cyanide (d) an alkyl isocyanide

5. What is formed, when nitrobenzene is reduced using zinc and alkali?
(a) Phenol (b) Aniline
(c) Nitrosobenzene (d) Hydrazobenzene

6. Which of the following will produce isopropyl amine?

(I) $(CH_3)_2CO \xrightarrow{NH_2OH} X \xrightarrow{LiAlH_4}$

(II) $CH_3-CH_2-CHO \xrightarrow[heat]{NH_3} X \xrightarrow{LiAlH_4}$

(III) $(CH_3)_2CH-OH + PCl_5 \longrightarrow X \xrightarrow{NH_3}$

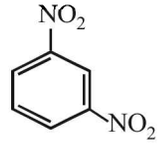
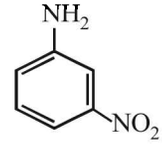
(IV) $CH_3-CH_2-CH_2-NH_2 \xrightarrow{heat}$

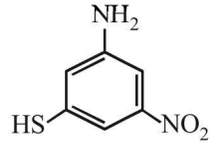
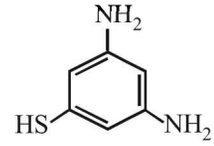
(a) I, II (b) II, III
(c) I, III (d) IV only

7. A positive carbylamine test is given by :
(a) N, N—dimethylaniline
(b) 2, 4–dimethylaniline
(c) N–methyl-*o*-methylaniline
(d) All of the above

8. Which of the following reagents will convert *p*-methylbenzenediazonium chloride into *p*-cresol?
(a) Cu powder (b) H_2O
(c) H_3PO_2 (d) C_6H_5OH

9. The major product (70% to 80%) of the reaction between *m*-dinitrobenzene with NH_4HS is :

(a)  (b) 

(c)  (d) 

10. $R-NH_2 + \underset{\text{(excess)}}{CH_3COCl} \longrightarrow A$.

The product (A) will be –
(a) $RNHCOCH_3$ (b) $RN(COCH_3)_2$
(c) $\overset{+}{R}N(COCH_3)_3Cl^-$ (d) $R-CONH_2$

11. Ethyl isocyanide on hydrolysis in acidic medium generates:
(a) propanoic acid and ammonium salt
(b) ethanoic acid and ammonium salt
(c) methylamine salt and ethanoic acid
(d) ethylamine salt and methanoic acid

12. High basicity of Me_2NH relative to Me_3N is attributed to :
(a) effect of solvent (b) inductive effect of Me
(c) shape of Me_2NH (d) shape of Me_3N

13. A compound with molecular mass 180 is acylated with CH_3COCl to get a compound with molecular mass 390. The number of amino groups present per molecule of the former compound is :
(a) 2 (b) 5 (c) 4 (d) 6

14. Electrolytic reduction of nitrobenzene in weakly acidic medium gives :
(a) N-Phenylhydroxylamine
(b) Nitrosobenzene
(c) Aniline
(d) *p*-Hydroxyaniline

15. The end product (Y) in the reaction sequence

$$CH_3CONH_2 \xrightarrow[\Delta]{P_2O_5} X \xrightarrow{Sn/HCl} Y$$, is :

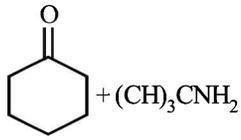
(a) ethane nitrile (b) acetic acid
(c) ethanamine (d) chloroethane

Application Based MCQs

16. In the Hoffmann bromamide degradation reaction, the number of moles of NaOH and Br_2 used per mole of amine produced are :
(a) Two moles of NaOH and two moles of Br_2.
(b) Four moles of NaOH and one mole of Br_2.
(c) One mole of NaOH and one mole of Br_2.
(d) Four moles of NaOH and two moles of Br_2.

17. In which of the following pairs of reactants is most effective in forming an enamine :

(a) $CH_3-CH_2-\overset{\overset{O}{\|}}{C}H+[(CH_3)_2CH]_2NH$

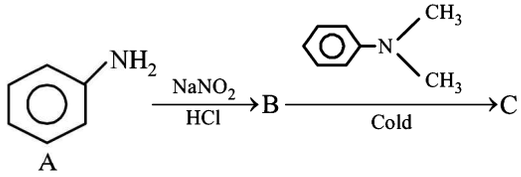
(b)  $+(CH)_3CNH_2$

(c) $(CH_3)_3C\overset{\overset{O}{\|}}{C}H+(CH_3)_2NH$

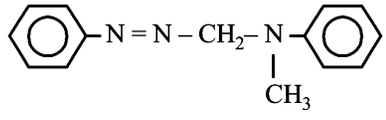
(d) None of these forms an enamine

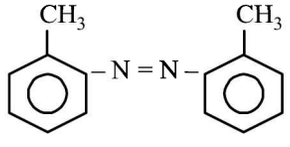
18. Which is not the property of ethanenitrile (CH_3CN) :
(a) Undergoes acidic hydrolysis to give carboxylic acid.
(b) Undergoes alkaline hydrolysis to give salt of carboxylic acid.
(c) It tautomerises to give methyl isocyanide.
(d) It gives carbylamine reaction with chloroform.

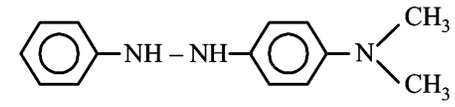
19. In a reaction of aniline a coloured product C was obtained.

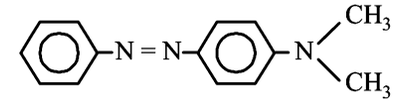


The structure of C would be :

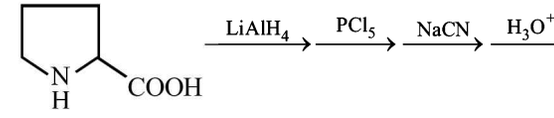
(a) 

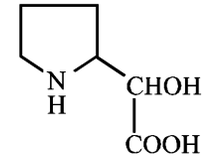
(b) 

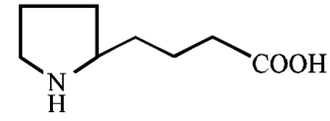
(c) 

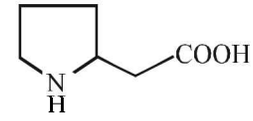
(d) 

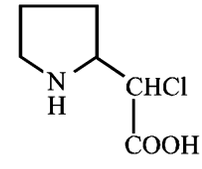
20. Which of the following is NOT a correct method of the preparation of benzylamine from cyanobenzene ?
(a) H_2/Ni
(b) (i) $LiAlH_4$ (ii) H_3O^+
(c) (i) $SnCl_2 + HCl(gas)$ (ii) $NaBH_4$
(d) (i) HCl/H_2O (ii) $NaBH_4$

21. 

(a) 

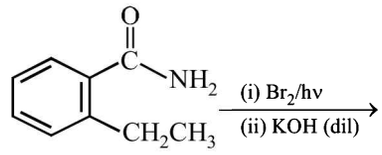
(b) 

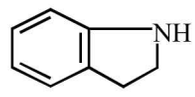
(c) 

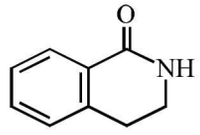
(d) 

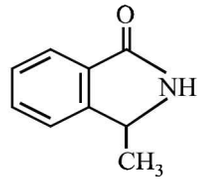
22. The correct sequence of reactions to convert *p*-nitrophenol in to quinol involves :
(a) Reduction, diazotization and hydrolysis
(b) Hydrolysis, diazotization and reduction
(c) Hydrolysis, reduction and diazotization
(d) Diazotization, redution and hydrolysis

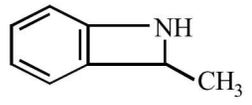
23. The major product of the following reaction is:



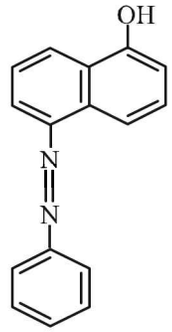
(a) 

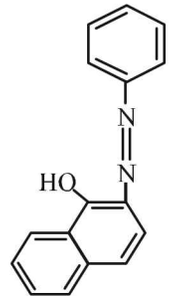
(b) 

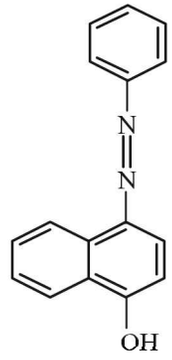
(c) 

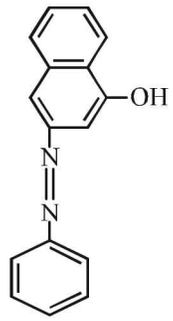
(d) 

24. Coupling of benzene diazonium chloride with 1-naphthol in alkaline medium will give :

(a) 

(b) 

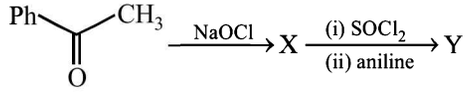
(c) 

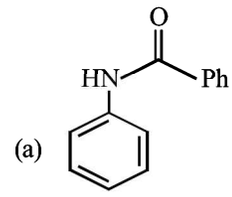
(d) 

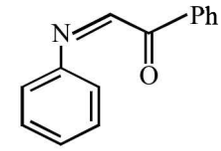
25. Aniline is reacted with bromine water and the resulting product is treated with an aqueous solution of sodium nitrite in presence of dilute hydrochloric acid. The compound so formed is converted into a tetrafluoroborate which is subsequently heated dry. The final product is :

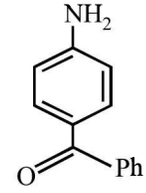
(a) 1,3, 5-tribromobenzene
(b) *p*-bromofluorobenzene
(c) *p*-bromoaniline
(d) 2,4, 6-tribromofluorobenzene

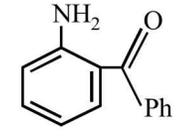
26. The major product 'Y' in the following reaction is:



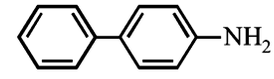
(a) 

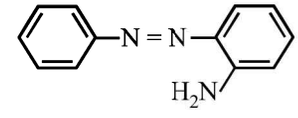
(b) 

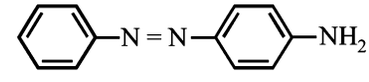
(c) 

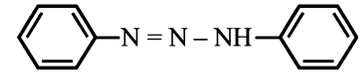
(d) 

27. Benzene diazonium chloride on reaction with aniline in the presence of dilute hydrochloric acid gives :

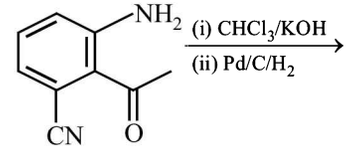
(a) 

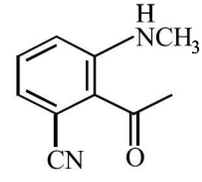
(b) 

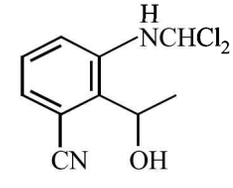
(c) 

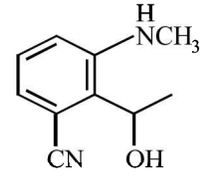
(d) 

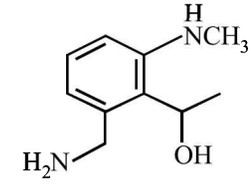
28. The major product obtained in the following reaction is :



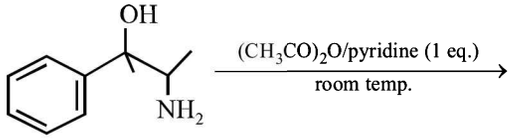
(a) 

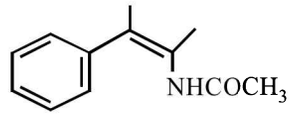
(b) 

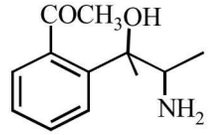
(c) 

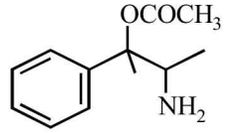
(d) 

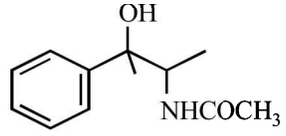
29. The major product obtained in the following reaction is:



(a) 

(b) 

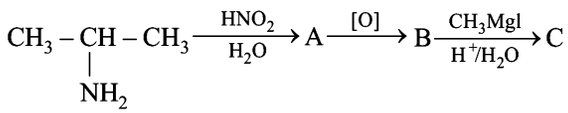
(c) 

(d) 

30. N_2 gas will not be evolved upon reaction of HNO_2 with which of the following amines :

(a) 1° (b) 2°
(c) 3° (d) Both (b) and (c)

31. In the following sequence of reactions, the compound C formed would be:



(a) 1,1-dimethyl ethanol
(b) butanol-1
(c) butanol-2
(d) 2-methyl-propanol-1

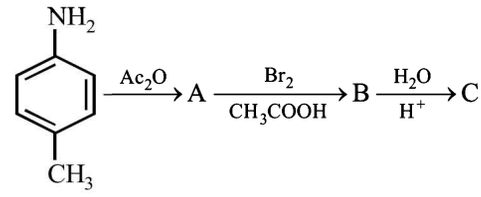
32. The correct stability order of the following resonance structures is :

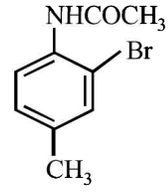
(a) (I) > (II) > (IV) > (III)
(b) (I) > (III) > (II) > (IV)
(c) (II) > (I) > (III) > (IV)
(d) (III) > (I) > (IV) > (II)

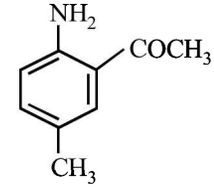
33. Which of the following tests is suitable to differentiate between aniline and benzylamine?

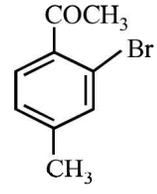
(a) Aniline gives dye test on diazotisation and reation with β-naphthol while benzylamine gives alcohol.
(b) Benzylamine gives green dry with β-naphthol after diazotisation while aniline gives orange dye.
(c) Aniline gives carbylamine reation while benzylamine does not.
(d) Benzylamine gives carbylamine reaction while aniline does not.

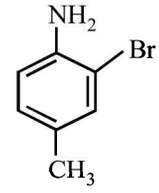
34. The final product C, obtained in this reaction would be



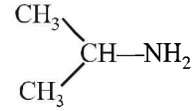
(a) 

(b) 

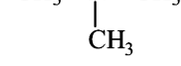
(c) 

(d) 

35. An organic compound (C_3H_9N) (A), when treated with nitrous acid, gave an alcohol and N_2 gas was evolved. (A) on warming with $CHCl_3$ and caustic potash gave (C) which on reduction gave isopropylmethylamine. Predict the structure of (A).

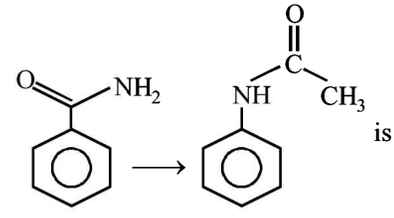
(a) 

(b) $CH_3CH_2—NH—CH_3$

(c) 

(d) $CH_3CH_2CH_2—NH_2$

36. The reagent required to convert

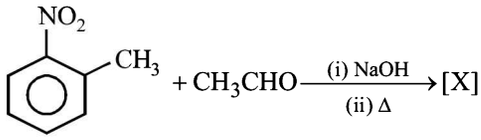


is

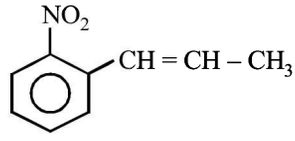
(a) $KOH/Br_2, LiAlH_4$ (b) $KOH/Br_2, CH_3COCl$
(c) $HNO_2, (CH_3CO)_2O$ (d) $KOH/Br_2, CH_3OH/Na$

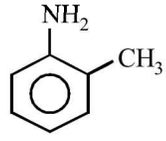
37. How aniline can be converted by efficient procedure to mononitro derivative?

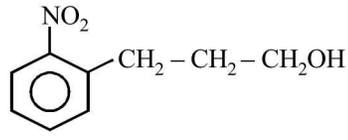
(a) nitration with conc. HNO_3 + conc. H_2SO_4
(b) aniline → dimethyl aniline → *p*-nitrosodimethyl aniline → *p*-nitromethyl aniline
(c) aniline → acetanilide → *o*-and *p*-nitroacetanilide → hydrolysed
(d) aniline → chlorobenzene via diazonium salt nitrated to give *o*-and *p*-chloronitro benzene → heated with NH_3

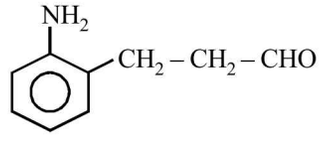
38. 

In this reaction [X] will be –

(a) 

(b) 

(c) 

(d) 

39. Nitration of aniline also gives *m*-nitro aniline, in strong acidic medium because :

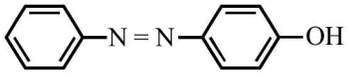
(a) in electrophilic substitution reaction amino group is meta directing.

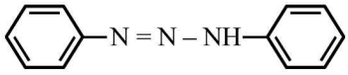
(b) inspite of substituents nitro group always goes to m-position.

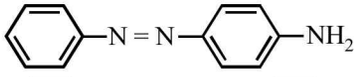
(c) in strong acidic medium, nitration of aniline is a nucleophilic substitution reaction.

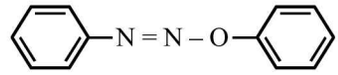
(d) in strong acidic medium aniline present as anilinium ion.

40. Aniline dissolved in dilute HCl is reacted with sodium nitrate at 0°C. This solution was added dropwise to a solution containing equimolar mixture of aniline and phenol in dil. HCl. The structure of the major product is:

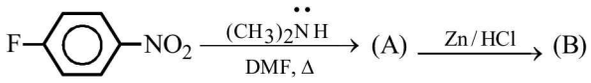
(a) 

(b) 

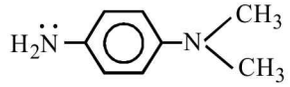
(c) 

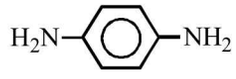
(d) 

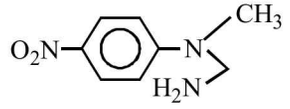
Skill Based MCQs

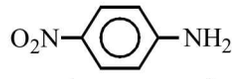
41. 

(B) is –

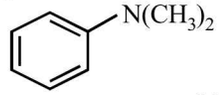
(a) 

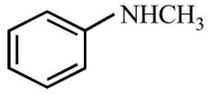
(b) 

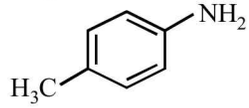
(c) 

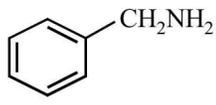
(d) 

42. Amongst the compounds given, the one that would form a brilliant colored dye on treatment with $NaNO_2$ in dil. HCl followed by addition to an alkaline solution of β-naphthol is :

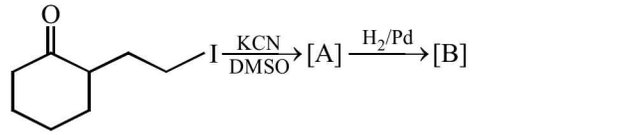
(a) 

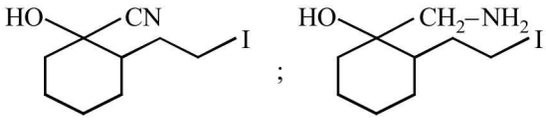
(b) 

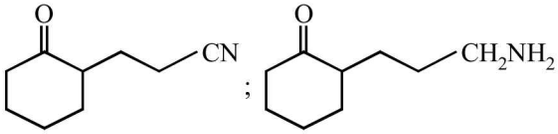
(c) 

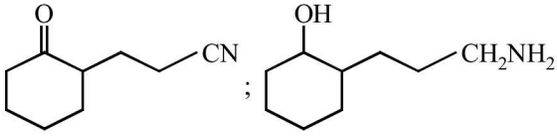
(d) 

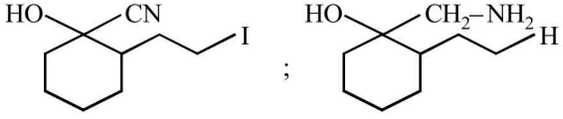
43. The major products A and B for the following reactions are, respectively:

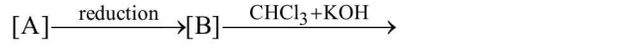


(a) 

(b) 

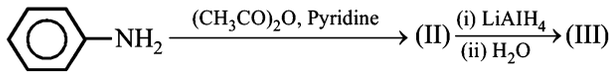
(c) 

(d) 

44. 

(a) Formaldehyde (b) Trichloromethane

(c) Nitrobenzene (d) Toluene

45. 

(I)

The basicity order of I, II and III is –

(a) III > I > II (b) I > II > III

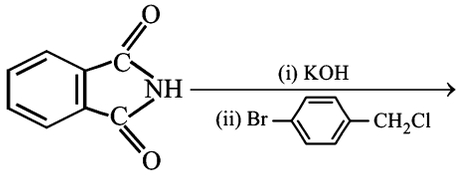
(c) III > II > I (d) II > III > I

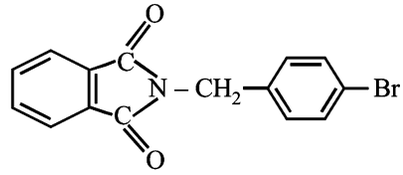
46. Ethylamine ($C_2H_5NH_2$) can be obtained from N-ethylphthalimide on treatment with :

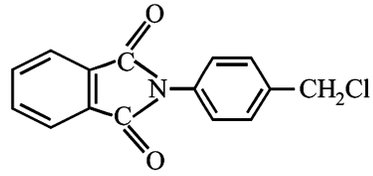
(a) NH_2NH_2 (b) CaH_2

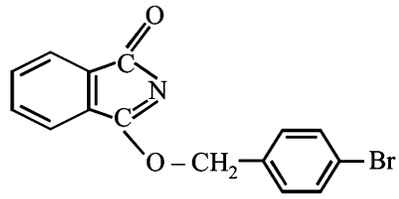
(c) $NaBH_4$ (d) H_2O

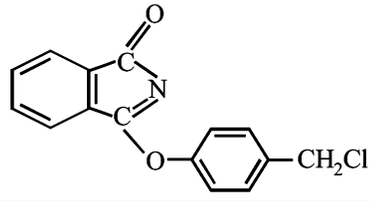
47. The major product of the following reaction is

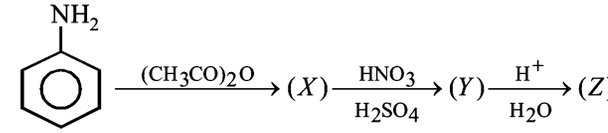


(a) 

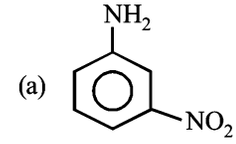
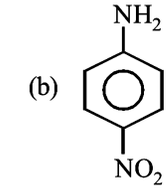
(b) 

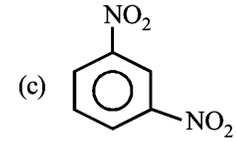
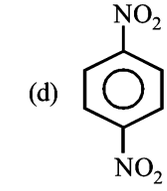
(c) 

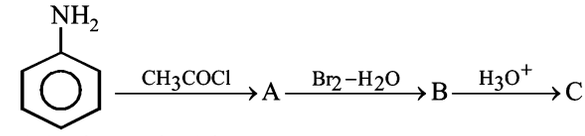
(d) 

48. 

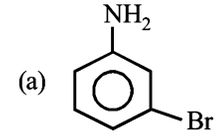
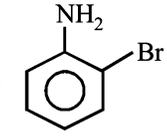
Product Z of the reaction

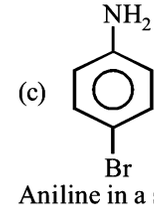
(a)  (b) 

(c)  (d) 

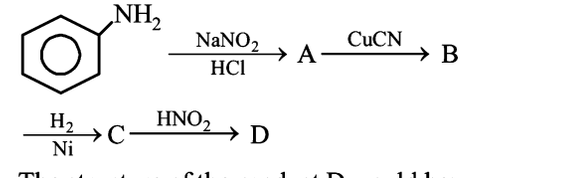
49. 

C (major product) is –

(a)  (b) 

(c)  (d) None of these

50. Aniline in a set of reactions yielded a product D.



The structure of the product D would be:

(a) C_6H_5NHOH (b) $C_6H_5NHCH_2CH_3$

(c) $C_6H_5CH_2NH_2$ (d) $C_6H_5CH_2OH$

ANSWER KEY

Conceptual MCQs																			
1	(b)	**3**	(c)	**5**	(d)	**7**	(b)	**9**	(b)	**11**	(d)	**13**	(b)	**15**	(c)				
2	(b)	**4**	(d)	**6**	(c)	**8**	(b)	**10**	(a)	**12**	(a)	**14**	(c)						
Application Based MCQs																			
16	(b)	**19**	(d)	**22**	(a)	**25**	(d)	**28**	(d)	**31**	(a)	**34**	(d)	**37**	(c)	**40**	(c)		
17	(a)	**20**	(d)	**23**	(c)	**26**	(a)	**29**	(d)	**32**	(b)	**35**	(a)	**38**	(a)				
18	(d)	**21**	(c)	**24**	(c)	**27**	(c)	**30**	(d)	**33**	(a)	**36**	(b)	**39**	(d)				
Skill Based MCQs																			
41	(a)	**42**	(c)	**43**	(c)	**44**	(c)	**45**	(a)	**46**	(a)	**47**	(a)	**48**	(b)	**49**	(c)	**50**	(d)