NEET ANSWER KEY & SOLUTIONS

SUBJECT :- CHEMISTRY

CLASS :- 12th **PAPER CODE :- CWT-10**

CHAPTER :- AMINE

ANSWER KEY

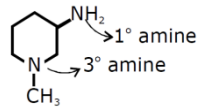
1.	(A)	**2.**	(A)	**3.**	(A)	**4.**	(B)	**5.**	(C)	**6.**	(B)	**7.**	(B)
8.	(C)	**9.**	(A)	**10.**	(A)	**11.**	(A)	**12.**	(D)	**13.**	(C)	**14.**	(D)
15.	(C)	**16.**	(D)	**17.**	(C)	**18.**	(D)	**19.**	(C)	**20.**	(B)	**21.**	(A)
22.	(D)	**23.**	(B)	**24.**	(C)	**25.**	(C)	**26.**	(A)	**27.**	(C)	**28.**	(B)
29.	(B)	**30.**	(B)	**31.**	(B)	**32.**	(D)	**33.**	(B)	**34.**	(C)	**35.**	(D)
36.	(A)	**37.**	(D)	**38.**	(A)	**39.**	(D)	**40.**	(D)	**41.**	(D)	**42.**	(A)
43.	(D)	**44.**	(A)	**45.**	(C)	**46.**	(A)	**47.**	(D)	**48.**	(D)	**49.**	(A)
50.	(B)												

SOLUTIONS

SECTION-A

1. (A)

Sol.



2. (A)

Sol. $R-C\equiv N + Na + EtOH \longrightarrow RCH_2NH_2$, Mendius Reaction.

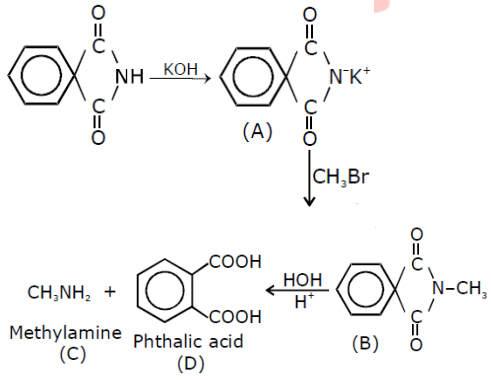
3. (A)

Sol. Hoffmann bromamide degradation reaction

$RCONH_2 + Br_2 + 4KOH \longrightarrow RNH_2 + 2KBr + K_2CO_3 + 2H_2O$

4. (B)

Sol.



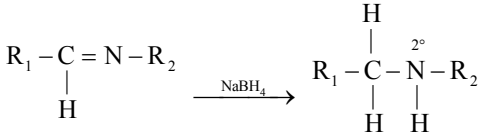
5. (C)

Sol. Hoffmann bromamide reaction

$CH_3CONH_2 + Br_2 + 4KOH \longrightarrow CH_3NH_2 + 2KBr + K_2CO_3 + 2H_2O$

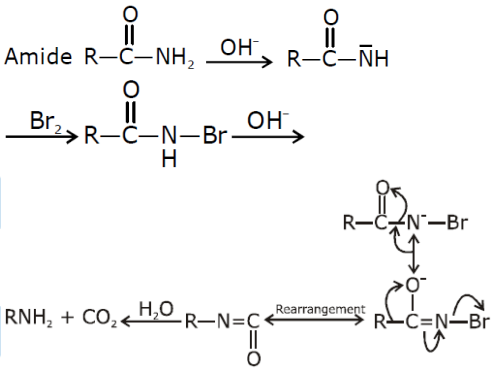
6. (B)

Sol. Reduction of Schiff's base



7. (B)

Sol. $RCONH_2 + Br_2 + 4KOH \longrightarrow RNH_2 + 2KBr + K_2CO_3 + 2H_2O$

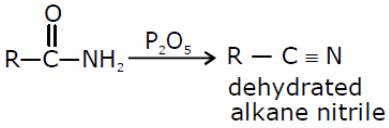


8. (C)

Sol. $\underset{\text{Alkyl halide}}{R-X} + AgCN \longrightarrow \underset{\text{Alkyl isocyanide}}{RNC} + AgX$

9. (A)

Sol.

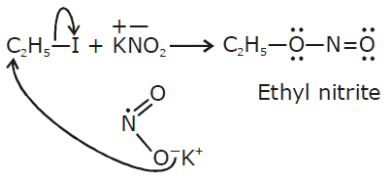


10. (A)

Sol. $\underset{\text{cyanogen chloride}}{Cl-CN} + CH_3-MgI \longrightarrow \underset{\text{(Ethane nitrile)}}{CH_3-C\equiv N} + MgICl$

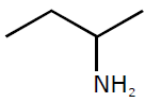
11. (A)

Sol.



12. (D)

Sol. sec–Butyl amine



13. (C)

Sol. In Hoffmann bromamide reaction, primary amide reacts with bromine and sodium hydroxide to form isocyanate, which is hydrolysed to give primary amine (with one carbon less) along with decarboxylation.

$RCONH_2+Br_2+NaOH \rightarrow$

$R–N=C=O \rightarrow RNH_2+H_2O+CO_2$

14. (D)

Sol. $\underset{\text{alkyl isocyanide}}{R-N\equiv C}+2H_2O \xrightarrow{K^+} \underset{1^\circ \text{ amine}}{R-NH_2}+HCOOH$

15. (C)

Sol. $CH_3—CN \xrightarrow[C_2H_5OH]{Na^+} CH_3CH_2NH_2$

(Methyl cyanide) (Ethylamine)

16. (D)

Sol. $CH_2=NOH \xrightarrow[LiAlH_4]{[H]} CH_3NH—OH$

Formaldoxime N-Methylhydroxyl amine

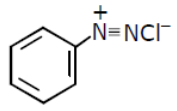
17. (C)

Sol. $R-\ddot{N}H_2$ 1° amine

18. (D)

Sol. Dimethylamine is more basic as it is a secondary amine and has two methyl groups directly attached to the nitrogen atom, compared to one methyl group in methylamine.

19. (C)

Sol. 

20. (B)

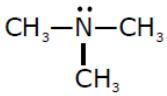
Sol. The pungent smell of mustard oil is due to a sulphur containing compound named allyl isothiocyanate ; 3–isothiocyanato-1-propene $CH_2=CH—CH_2—NCS$

21. (A)

Sol. $(CH_3)_3N$ < $(CH_3)_2NH$

3°amine 2°amine

In 3°amine all the hydrogen atoms are substituted by other alkyl or an aryl groups.



Steric hindrance

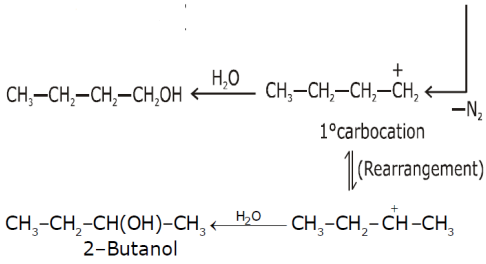
The size of alkyl group ($–CH_3$) is more than that of a hydrogen atom. So, an alkyl group would hinder the attack of a hydrogen atom, thus decreasing the basicity of the molecule. So, more the number of alkyl groups lesser will be its basicity.

So, the decreasing order of basicity will be : Secondary amine > Tertiary amine ~ Primary amine > Ammonia

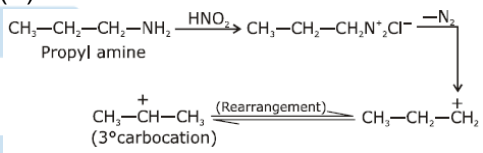
22. (D)

Sol. $CH_3CH_2CH_2NH_2 \xrightarrow[\text{(aqueous)}]{NaNO_2+HCl}$

$CH_3CH_2CH_2CH_2N_2 + Cl^-$ Butyl amine



23. (B)

Sol. 

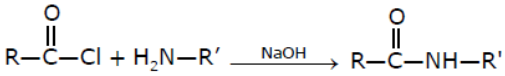
24. (C)

Sol. $C_2H_5—NH_2 \xrightarrow{CHCl_3 + KOH} C_2H_5NC$

1°amine Ethyl isocyanide

25. (C)

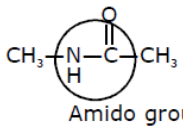
Sol. Schotten–Baumann reaction



26. (A)

Sol. $RNC \xrightarrow{H_3O^+} \underset{1^0 \text{ amine}}{RNH_2} + HCOOH$

27. (C)

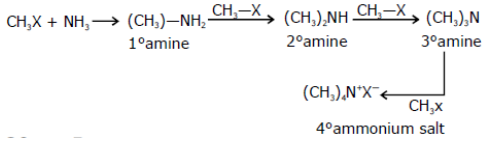
Sol. 

Amido group

$(CH_3)_2(NH) \longrightarrow$ Imino group

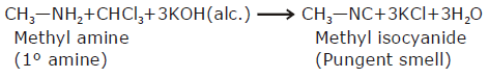
28. (B)

Sol. Hoffmann ammonolysis



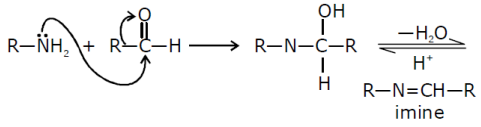
29. (B)

Sol. Carbylamine reaction



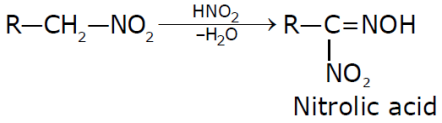
30. (B)

Sol.



31. (B)

Sol.



32. (D)

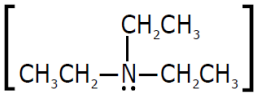
Sol. Filteration is generally not employed for the separation of primary, secondary and tertiary amines.

33. (B)

Sol. $CH_3NH_2 + CHCl_3 + 3KOH \longrightarrow CH_3NC + 3KCl + 3H_2O$

(X) (Y)

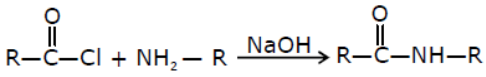
34. (C)

Sol. Triethyl amine 

A tertiary amine will not react with hinsberg reagent
(Benzene sulphonyl chloride)

35. (D)

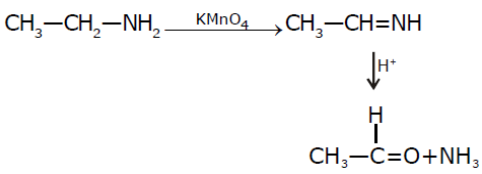
Sol. Schotten–Baumann reaction



SECTION-B

36. (A)

Sol.

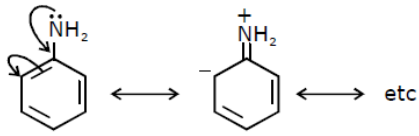


37. (D)

Sol. $CH_3NH_2 + CHCl_3 + KOH(alc) \longrightarrow CH_3NC$ (Methyl amine) (Chloroform) (Methyl isocyanate)

38. (A)

Sol. Aniline

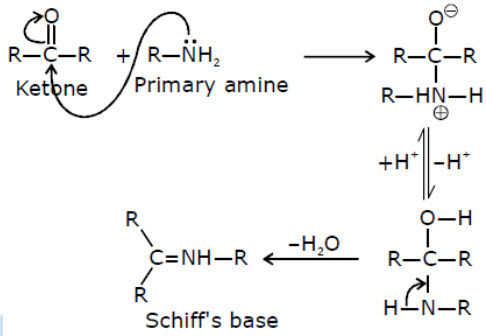


Aromatic amine

Since, during this resonance lone pair availability over nitrogen atom decreases. So, donating tendency/H+ ion accepting tendency decreases. So, basicity decreases.

39. (D)

Sol.

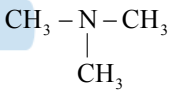


40. (D)

Sol. (I) $CH_3—CH_2—NH_2$ (Ethylamine)

(II) $CH_3—CH_2—NH—CH_3$(Ethylmethylamine)

(III) $CH_3—CH_2—CH_2—NH_2$ (1–Propanamine)

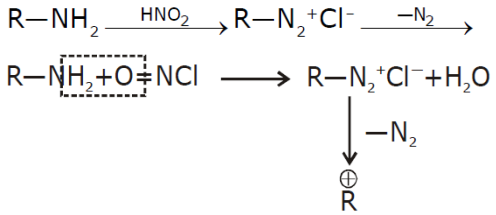
(IV) 

(N,N—Dimethylmethanamine)

Compound (IV) have lowest boiling point because smallest surface area of a molecule, decreases its vander waal's force values.

41. (D)

Sol.



42. (A)

Sol. H_2PtCl_6 (Chloroplatinic acid) $2H^+ + PtCl_6^{-2}$

43. (D)

Sol. The weak base methylamine, CH_3NH_2, reacts with water according to the equation $CH_3NH_2(aq)+H_2O(l) \rightleftharpoons OH^-(aq)+CH_3NH_2(aq)$

44. (A)

Sol. $R—NH_2 + CS_2 \xrightarrow{HgCl_2} R—N=C=S$

45. (C)

Sol. **List I (Reagent)**

A. Ammonical $AgNO_3$

B. HIO_2

C. Alkaline $KMnO_4$

D. Chloroform + NaOH

List II (used as test reagent for)

b. Aldehyde

c. Vicinal–OH groups

d. Double bond

a. Primary amine

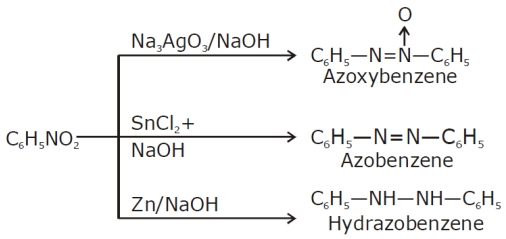
46. (A)

Sol. When nitrobenzene is reduced in an alkaline medium phenylhydroxylamine is obtained. This intermediate react to form azoxybenzene.

Azoxybenzene on further reduction forms azobenzene and hydrazobenzene.

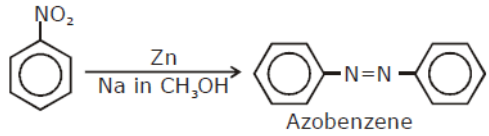
47. (D)

Sol.



48. (D)

Sol.



49. (A)

Sol. Amines are basic due to the presence of a lone pair of electrons on nitrogen atom. The lone pair can be easily donated.

50. (B)

Sol. Nitrobenzene does not undergo Friedel Craft reaction because nitro group deactivate the ring towards electrophilic substitution and drastic conditions are needed to carry out the electrophilic substitution reactions.