QUIZ

CHAPTER: AMINES

Time: 1 Hr **Marks: 73**

General Instructions:

1. Questions **1–6** are based on **Comprehension**, questions **7–13** have **Only one correct option** and questions **14–16** may have **More than one correct option** and question **17–18 are numerical with single digit integer type answer.** And question **19 is Matrix-Match type answer.**

Marking Scheme:

(a) For questions **1–6**, **+4** marks will be awarded for each **right** answer and **-2** marks will be deducted for each **wrong** answer.

(b) For questions **7–13**, **+3** marks will be awarded for each **right** answer and **-1** mark will be deducted for each **wrong** answer.

(c) For questions **14–16**, **+4** marks will be awarded for each **right** answer and **-2** marks will be deducted for each **wrong** answer.

(d) For questions **17–18**, **+4** marks will be awarded for each **right** answer and **0** marks will be deducted for each **wrong** answer.

(e) For questions **19, +2,** marks will be awarded for each **right** answer and **-1** mark will be deducted for each **wrong** answer.

COMPREHENSION – I (Only one option correct)

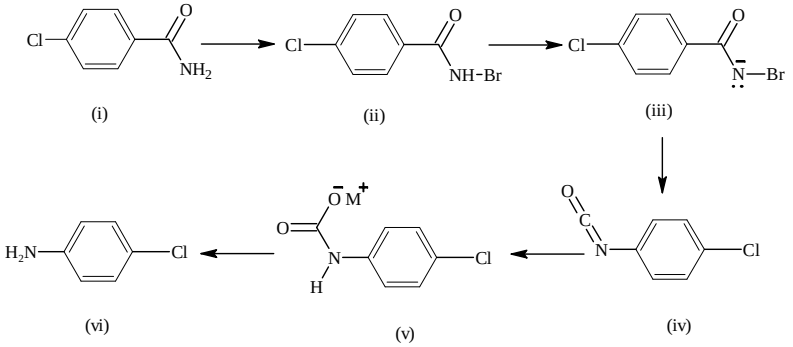
Formation of amine salts can be used to isolate and characterize amines. Most amines containing more than six carbon atoms are relatively insoluble in water. In dilute aqueous acids, these amines form their corresponding ammonium salts and they dissolve. Formation of soluble salt is one of the characteristic functional group test for amines.
The formation of amine salts is also used to separate amines from less basic compounds. When the solution is made alkaline (by addition of NaOH) the free amine is regenerated. The purified free amine either separates out of the aqueous solution or is extracted into an organic solvent. Many drugs and other biologically important amines are commonly stored and used as their salts. Amine salts are less prone to decomposition by oxidation and other reactions and they have virtually no fishy odor. The salts are soluble in water and they are easily converted to solution for syrup and injections.

1. Amine form salt with which of the following reagent
   (A) NaOH (B) KOH
   (C) HBr (D) All of these

2. In the presence of NaOH amines separate out because
   (A) amines react with NaOH (B) amines are less basic than NaOH
   (C) amines form slat with NaOH (D) None of these

COMPREHENSION – II (Only one option correct)

$RCONH_2$ is converted into RNH_2 by means of Hofmann bromamide degradation.



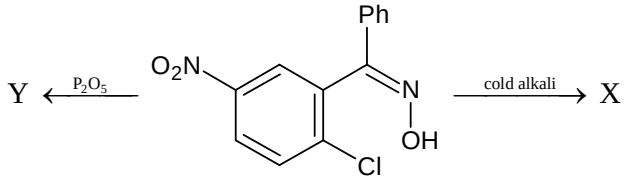
In this reaction, RCONHBr is formed from which this reaction has derived its name. Electron donating group at phenyl activates the reaction. Hofmann degradation reaction is an intramolecular reaction.

3. How can the conversion of (i) to (ii) be brought about?
   (A) KBr (B) KBr + CH_3ONa
   (C) KBr + KOH (D) Br_2 + KOH

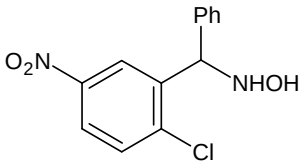
4. Which is the rate determining step in Hofmann bromamide degradation?
   (A) Formation of (i) (B) Formation of (ii)
   (C) Formation of (iii) (D) Formation of (iv)

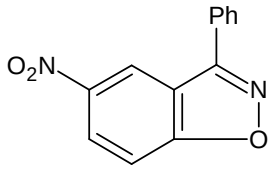
COMPREHENSION – III (Only one option correct)

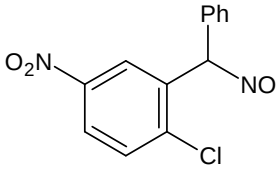
The acid-catalyzed transformation of a ketoxime to N-substituted amide is known as Beckmann rearrangement. This rearrangement is catalyzed by a variety of reagents like H_2SO_4, H_3PO_2 etc. This involves the migration of that group which is anti to OH.

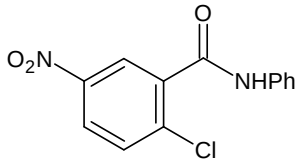


5. X is

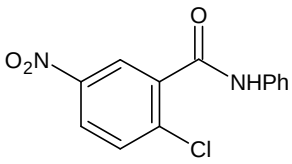
(A) 

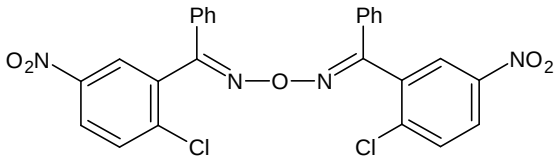
(B) 

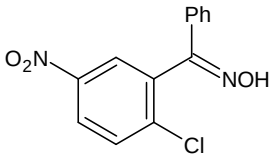
(C) 

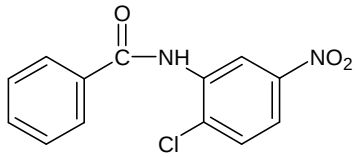
(D) 

6. Y is

(A) 

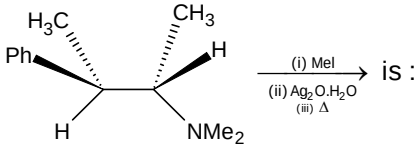
(B) 

(C) 

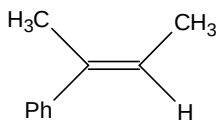
(D) 

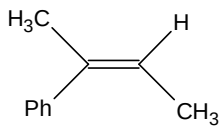
MULTIPLE CHOICE QUESTIONS (Only one correct option)

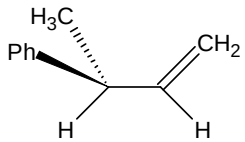
7. The major product obtained in the following reaction :

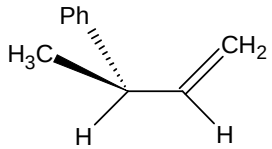


is :

(A) 

(B) 

(C) 

(D) 

8. The order of basic strength among the following amines in benzene solution is
(A) $CH_3NH_2 > (CH_3)_3N > (CH_3)_2NH$ (B) $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N$
(C) $CH_3NH_2 > (CH_3)_2NH > (CH_3)_3N$ (D) $(CH_3)_3N > (CH_3)_2NH > CH_3NH_2$

9. The action of nitrous acid on ethyl amine gives
(A) Ethane (B) Ethyl nitrite
(C) Ethyl alcohol (D) Nitroethane

10. A nitrogen containing compound on heating with $CHCl_3$ and alc. KOH evolved very bad smelling vapours. The compound is
(A) Nitrobenzene (B) Benz amide
(C) N, N-Dimethyl aniline (D) Aniline

11. The compound which on reaction with aqueous nitrous acid at low temperature produces an oily nitrosoamine is
(A) methyl amine (B) ethyl amine
(C) diethyl amine (D) triethyl amine

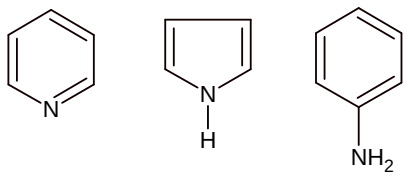
12. Identify **X** in the sequence
$C_3H_9N(\mathbf{X}) \xrightarrow{HNO_2} C_3H_8O \xrightarrow[H_2SO_4]{K_2Cr_2O_7} C_3H_6O_2$
(A) $CH_3CH_2NHCH_3$ (B) $CH_3CH_2CH_2NH_2$
(C) $(CH_3)_3N$ (D) $CH_3—CH(NH_2)—CH_3$

13. What is the end product in the following sequence of reactions?
$C_2H_5NH_2 \xrightarrow{HNO_2} A \xrightarrow{PCl_5} B \xrightarrow{NH_3} C$
(A) Ethyl cyanide (B) Ethyl amine
(C) Methyl amine (D) Acetamide

MULTIPLE CHOICE QUESTIONS (More than one correct option)

14. Phenyl cyanide can be obtained by:
(A) $C_6H_5CONH_2 \xrightarrow{P_2O_5,\ \Delta}$ (B) $C_6H_5-CH=NOH \xrightarrow{AC_2O,\ \Delta}$
(C) $C_6H_5Cl \xrightarrow{\text{alc. KOH}}$ (D) $C_6H_5NH_2 \xrightarrow[\text{(ii) CuCN}]{\text{(i) } NaNO_2/HCl}$

15.



Pyridine II Pyrole I Aniline III

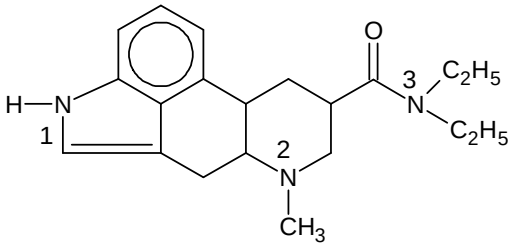
Which is/are correct statement(s)?
(A) I is more basic than II (B) II is more basic than I and III
(C) III is more basic than II (D) All are aromatic bases

16. Which of the following would react with nitrobenzene to produce hydrazobenzene?
(A) Na_3AsO_3 + NaOH (B) Zn/NaOH, CH_3OH
(C) Zn, NaOH (D) NH_2NH_2 + alc. KOH

SINGLE INTEGER ANSWER TYPE

17. Deamination (or) diazotization of n-Bu-NH_2 with $NaNO_2$/HCl gives……isomeric butene.

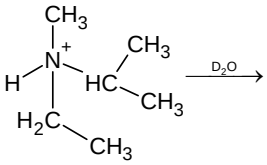
18. Which nitrogen in the following compound is most basic

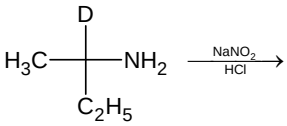


MATCH-MATRIX TYPE QUESTION

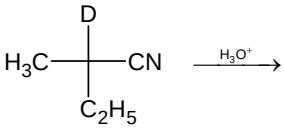
19. Match the reactions given in Column-I with the facts given in Column-II:

Column – I

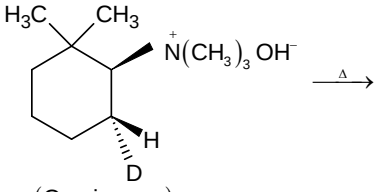
(A)


(B)


(One enantiomer)

(C)


(One enantiomer)

(D)


(One isomer)

Column – II

(p) Develops a racemic mixture

(q) An alkene is obtained

(r) Configuration is retained

(s) Product may contain deuterium

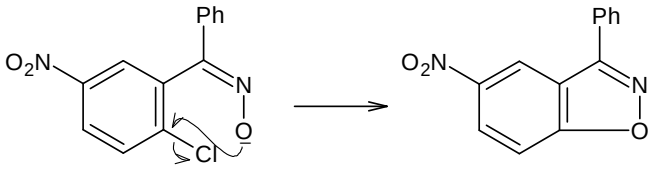
(t) No stereogenic centre in the product

ANSWERS

1.	**C**	2.	**B**	3.	**D**
4.	**D**	5.	B	6.	**A**
7.	**B**	8.	**D**	9.	**C**
10.	**B**	11.	**C**	12.	**B**
13.	**B**	14.	**A, B, D**	15.	**B, D**
16.	**C, D**	17.	**3**	18.	**2**
19.	**A → (p, q, s); B → (p, s); C → (r, s); D → (q, t)**				

Solution

5.



6. Normal Beckmann Rearrangement.

19. In case of (A), compound given in (A) exchanges – H with – D and becomes racemic.
In case (B), compound in (B) reacts through a carbocation and gives racemic mixture.
In case of (C), no bond attached to the stereocentre breaks in reaction of (C), so retention.
In case of (D), compound in (D) gives Hoffmann elimination and it is an example of anti-elimination. Product does not have any stereogenic centre.