MCQs with One Correct Answer

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

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

- (a) ethane nitrile
- (b) acetic acid
- (c) ethanamine
- (d) chloroethane
- 2. The end product of the reactions is

$$C_2H_5NH_2 \xrightarrow{HNO_2} A \xrightarrow{PCl_5} B \xrightarrow{H.NH_2} C$$

- (a) ethyl cyanide
- (b) ethyl amine
- (c) methyl amine
- (d) acetamide
- The correct order of basicities of the following 3. compounds is

1.
$$CH_3 - CH_3 - CH_2 - NH_2$$

 NH_2
2. $CH_3 - CH_2 - NH_2$

- 3.
- $(CH_3)_2NH$ 4. CH_3-C-NH_2
- (a) 2 > 1 > 3 > 4
- (b) 1 > 3 > 2 > 4
- (c) 3 > 1 > 2 > 4
- (d) 1 > 2 > 3 > 4
- 4. *n*-Butylamine(I), diethylamine(II) and N, N-dimethylethyl amine(III) have the same molar mass.

The increasing order of their boiling point is

- (a) III < II < I
- (b) I < II < III
- (c) II < III < I
- (d) II < I < III
- Which of the following reactions will not give a primary amine?
 - $CH_3CONH_2 \xrightarrow{Br_2/KOH}$
 - (b) $CH_3CN \xrightarrow{LiAlH_4}$
 - (c) $CH_3NC \xrightarrow{LiAlH_4}$
 - (d) $CH_3CONH_2 \xrightarrow{LiAlH_4}$

$$CH_3CH_2Cl \xrightarrow{NaCN} X \xrightarrow{Ni/H_2} Y$$

$$\xrightarrow{acetic anhydride} Z$$

Z in the above reacting sequence is

- (a) CH₃CH₂CH₂NHCOCH₃
- (b) CH₃CH₂CH₂NH₂
- (c) CH₃CH₂CH₂CONHCH₃
- (d) CH₃CH₂CH₂CONHCOCH₃ Identify the prdouct C in the series

$$CH_3CN \xrightarrow{\text{Na/C}_2H_5OH} A \xrightarrow{\text{HNO}_2} B$$

$$\xrightarrow{\text{Cu/573K}}$$
 C

- (a) CH₃COOH (b) CH₃CH₂NHOH
- (c) CH₃CONH₂ (d) CH₃CHO

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8. The major organic product formed from the following reaction:

$$\qquad \qquad \underbrace{ \begin{array}{c} O \\ \hline (i) \ CH_3NH_2 \\ \hline (ii) \ LiAlH_4, (iii) \ H_2O \\ \end{array} } \cdots \cdots$$
 is

(c)
$$\stackrel{\text{H}}{\searrow}$$
 $\stackrel{\text{NCH}_3}{\searrow}$

(d)
$$\longrightarrow$$
 $\stackrel{\text{H}}{\sim}$ $\stackrel{\text{NCH}_3}{\sim}$

9.
$$\underbrace{\begin{array}{c} \text{(i) } H_2O_2 \\ \text{(ii) heat} \end{array}}_{CH_3} \text{ Product P is}$$

(a)
$$CH_3$$
 (b) CH_3 (c) CH_3 (d)

10. Predict the product:

$$\begin{array}{c}
\text{NHCH}_3 + \text{NaNO}_2 + \text{HCI} \\
& \longrightarrow \text{Product} \\
\text{CH}_3
\end{array}$$

(a)
$$CH_3$$
 $N-NO_2$

(b)
$$NHCH_3$$
 $NHCH_3$ $NHCH_3$

(c)
$$OH \atop N-CH_3$$

11. In a set of reactions *m*-bromobenzoic acid gave a product D. Identify the product D.

$$\begin{array}{c}
COOH \\
\hline
SOCl_2 \\
Br
\end{array}$$

$$\begin{array}{c}
NH_3 \\
C \\
\hline
Br_2
\end{array}$$

$$\begin{array}{c}
NaOH \\
Br_2
\end{array}$$

(a)
$$Old SO_2NH_2$$
 (b) $Old SO_2NH_2$ (b) $Old SO_2NH_2$

12.
$$\underbrace{\text{(I)}}_{\text{(I)}} \text{NH}_2$$

$$\underbrace{\text{(CH}_3\text{CO)}_2\text{O}, Pyridine}}_{\text{(ii)}} \text{H}_2\text{O}} \text{III}$$

The basicity order of I, II and III is –

- (a) III > I > II
- (b) I > II > III
- (c) III > II > I
- (d) $\parallel > \parallel \parallel > \parallel$

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13. What could be the product for the following reaction?

$$\begin{array}{c}
N(CH_3)_2 \\
\xrightarrow{\text{NaNO}_2, HC1}
\end{array}$$
Product?

(c)
$$NO$$
 NO NO NO NO NO

(d)
$$CH_3$$
 N
 CH_3
 CH_3

14. The major products **X**, **Y** and **Z** in the following sequence of transformations

$$NH_2 \xrightarrow{O} X \xrightarrow{\text{conc. HNO}_3} X \xrightarrow{\text{conc. HNO}_3} 15 \, ^{\circ}C$$

 $Y \xrightarrow{\text{aq. NaOH}} Z$

are

(a)
$$X = \bigvee_{O}^{NH_2} Y = \bigvee_{O}^{NH} NO$$

$$Z = HO$$
 O
 NH_2
 NO_2

(b)
$$X = \bigcup_{N \to 0} H$$
 $Y = \bigcup_{N \to 0} H$ $N \to 0$

(c)
$$X = \bigvee_{O}^{NH_2} Y = \bigcup_{O_2N}^{NH_2} OH$$

(d)
$$X = \bigvee_{O} \bigvee_{O} \bigvee_{V = \bigvee_{O} \bigvee$$

15. The correct order of basicity of the following amines

is

- $(a) \quad I > II > III > IV$
- (b) I > III > IV
- (c) III > II > IV
- (d) IV > III > II > I

Numeric Value Answer

- **16.** How many of the following method(s) is/ are used for eliminating nitrogen of an amine present outside the ring?
 - Hofmann elimination, Cope elimination and Emde degradation
- 17. How many of the following compounds can be methylated by diazomethane?
 C₂H₅COOH, C₂H₅NH₂, C₆H₅OH and CH₃COCH₂COOC₂H₅

- **18.** Starting with nitrobenzene, what is the minimum number of following reagents required to convert it to P-dinitrobenzene?
 - (a) Conc. HNO₃ + Conc. H₂SO₄,
 - (b) NH₃
 - (c) C₂H₅OK
 - (d) Sn + HC1
 - (e) $NaNO_2 + HBF_4$
 - (f) $NaNO_2 + Cu$
 - (g) (CH₃CO)₂O + Pyridine
 - (h) H₃O⁺

19. Find the total number of bromine atoms present in the end product of following scheme of reactions.

$$\begin{array}{c|c} NH_2 \\ \hline \\ NO_2 \end{array} \xrightarrow{\begin{array}{c} Br_2 \\ H_2O \end{array}} \xrightarrow{\begin{array}{c} Diazotisation \\ \hline \\ H_2O \end{array}} \xrightarrow{\begin{array}{c} CuBr \\ \hline \\ H_2O \end{array}}$$

20.
$$NH_{2} = \frac{\text{(i) HNO}_{2}, 0^{\circ}\text{C}}{\text{(ii) dil. H}_{2}\text{SO}_{4}, \Delta; \text{(iii) HI, } \Delta}$$

How many hydrogen atoms are present in the final product of above reaction?

		ANSWER KEY																		
I	1	(c)	3	(d)	5	(c)	7	(d)	9	(d)	11	(c)	13	(c)	15	(b)	17	(3)	19	(5)
Ī	2	(b)	4	(a)	6	(a)	8	(b)	10	(d)	12	(a)	14	(b)	16	(2)	18	(6)	20	(7)