CHEMISTRY

BOOKS - BITSAT GUIDE

NITROGEN CONTAINING COMPOUNDS

Practice Exercise

1. Gabriel phthalimide synthesis can be used for the preparation of amine from

A. CH_3CH_2Br

B. $(CH_3)_3CBr$

C. $p - CH_3OC_6H_4Br$

D. $p - CH_3C_6H_4Br$

Answer: A

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2. Hofmann's bromamide degradation reaction is shown by

A. $ArNH_2$

B. $ArCONH_2$

C. $ArNO_2$

D. $ArCH_2NH_2$

Answer: B

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3. A positive carbylamine test is given by:

A. p-methylbenzylamine

B. N, N-dimethylanilline

C. 2, 4-dimethylaniline

D. N-methyl-o-methyl aniline

Answer: A

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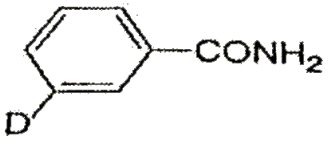
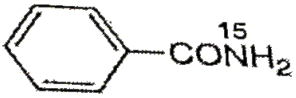
4. What are the constituent amines formed when the mixture of I and II undergoes

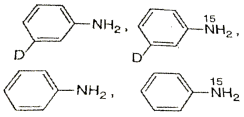
Hofmann's bromamide degradation?

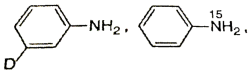


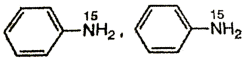
(1)

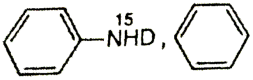


(2)

A. 

B. 

C. 

D. 

Answer: B

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5. The primary, secondary and tertiary amines can be best distinguished by

A. mustard oil reaction

B. carbylamine reaction

C. exhaustive alkylation

D. HNO_2 treatment

Answer: D

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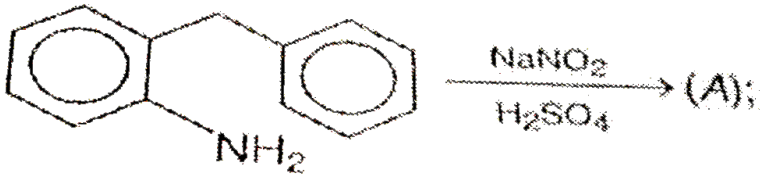
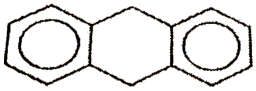
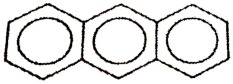
6. 

Product of this reaction is

A. 

B. 

C. 

D. 

Answer: B

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7. Which of the following compounds does not liberate nitrogen with HNO_2?

A. Carbamide

B. Primary amine

C. Secondary amine

D. Alkanamide

Answer: C

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8. Among the following compounds the one that is most reactive towards electrophilic nitration is

A. toluene

B. benzene

C. benzoic acid

D. nitrobenzene

Answer: A

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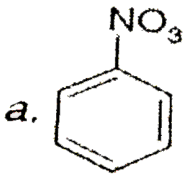
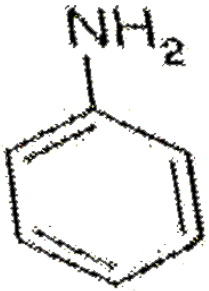
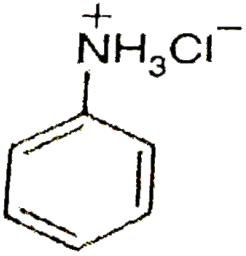
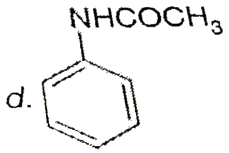
9. Towards electrophilic substitution, the most reactive species will be

A. 

B. 

C. 

D. 

Answer: B

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10. When aniline is treated with fuming sulphuric acid at 475 K, it gives

A. sulphanilic acid

B. aniline sulphate

C. o-aminobenzene sulphonic acid

D. m-aminobenzene sulphonic acid

Answer: A

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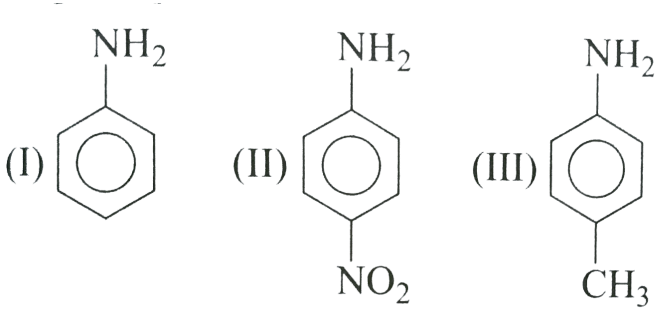
11.



The correct increasing order of basic strength for the following compounds is :

A. $II < III < I$

B. $III < I < II$

C. $III < II < I$

D. $II < I < III$

Answer: D

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12. Amino group, $-NH_2$ is ortho, para-directing group in case of aromatic electrophilic substitution but nitration of

aniline produce a good amount of m-nitroaniline. This is because

A. $-NH_2$ gets converted into $-NH^-NO_2^+$ which is m-directing

B. NH_2 gets converted into $\overset{+}{N}H_3$ which is m-directing

C. $-NH_2$ gets converted into $-NH^+SO_4^-$ which is m-directing

D. ortho, para activity of $-NH_2$ group is completely destroyed during nitration

Answer: B

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13. Reduction of aromatic nitro compounds using Fe and HCl gives

A. aromatic oxime

B. aromatic hydrocarbon

C. aromatic primary amine

D. aromatic amide

Answer: C

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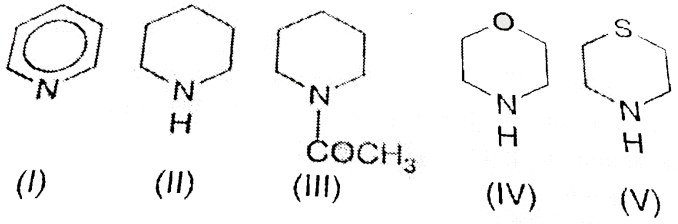
14. The relative order of basic character of the following compounds is



(I) (II) (III) (IV) (V)

A. $II > I > III > IV > V$

B. $II > III > IV > V > I$

C. $II > V > IV > I > III$

D. $II > IV > V > III > I$

Answer: C

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15. Which of the following amine does not react with Hinsberg reagent-

A. Neopentyl amine

B. Isopropyl amine

C. Triethyl amine

D. Ethyl methyl amine

Answer: C

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16. When primary aminereacts with chloroform in ehthanolic KOH then the product is .

A. an isocyanide

B. an aldehyde

C. a cyanide

D. an alcohol

Answer: A

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17. Tertiary nitro compounds do not tautomerise because

A. there is no double bond

B. there is no `alpha-hydrogen

C. oxygen is more electronegative than H

D. All of the above

Answer: B

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18. When p-toluidine reacts with sodium nitrite and hydrochloric acid at 274 K, a crystalline precipitate is formed, with is boiled with water. The resulting compound obtained is

A. p -cresol

B. p -nitro toluene

C. phenol toluic acid

D.

Answer: A

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19. The reagent used to distinguish p-methylaniline from N-methylaniline is

A. benzenesulphonyl chloride

B. iodoform in aic. KOH

C. AgCl

D. $AgNO_3$

Answer:

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20. The best reagent for converting 2-phenylpropanamide into 2-phenylpropanamine is

A. excess H_2

B. Br_2 in (aq) NaOH

C. iodine in the presence of phosphorus

D. $LiAlH_4$ in ether

Answer:

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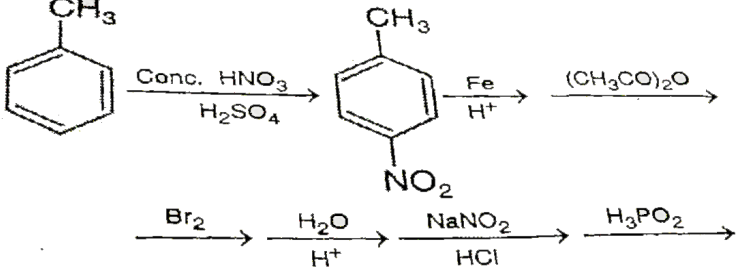
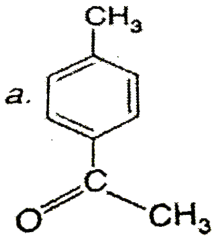
21. Consider the following reaction sequence.

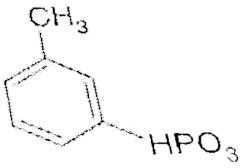
The final product of this reaction sequence is


CH3
Conc. HNO3
H2SO4
CH3
NO2
Fe
H+
(CH3CO)2O
Br2
H2O
H+
NaNO2
HCl
H3PO2

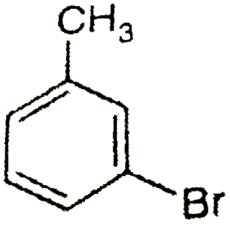
A.


a.
CH3
C
O
CH3

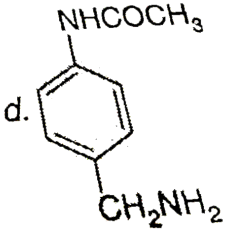
B.


CH3
HPO3

C.


CH3
Br

D.


NHCOCH3
d.
CH2NH2

Answer:

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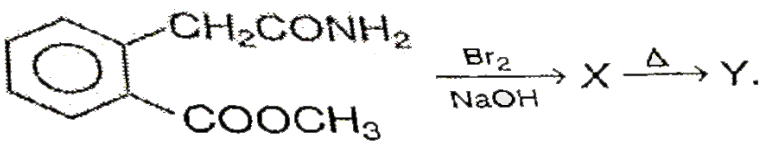
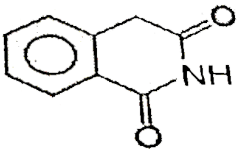
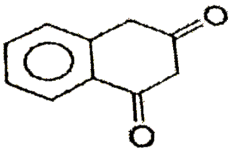
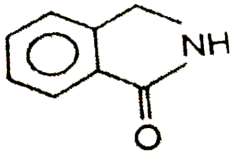
22. Consider the following series of reactions

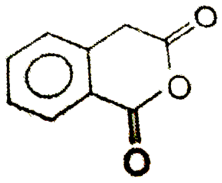


The compound Y is

A. 

B. 

C. 

D. 

Answer:

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23. Compound A (C_3H_9N) reacts with benzene sulphonyl chloride to form a solid insoluble in alkali. The structure of compound A is

A. $CH_3 - \underset{\underset{CH_3}{|}}{N} - CH_3$

B. $CH_3 - CH_2 - NH - CH_3$

C. $CH_3 - CH_2 - CH_2 - NH_2$

D. All of the above

Answer:

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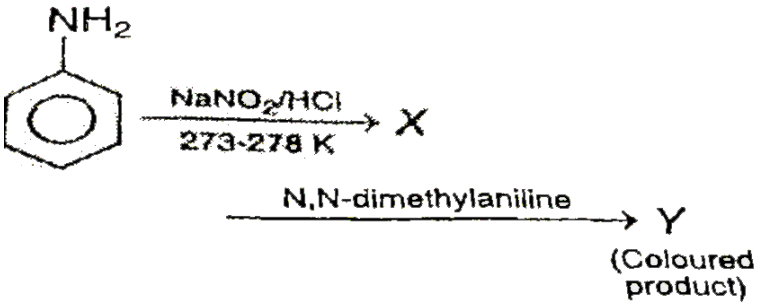
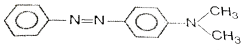
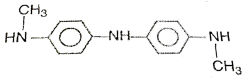
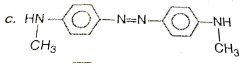
24. Aniline yields a coloured product Y through the following series of reaction:

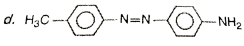


The structure of Y is

A. 

B. 

C. 

D. 

Answer:

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25. Consider the following statements:

Phenyl diazonium salts form azo dye with

I. aniline

II. Phenol

III. N, N - dimethyl aniline

IV. Anisole (methoxybenzene)

The correct statements is

A. II, III and IV are correct

B. I, III and IV are correct

C. I, II and IV are correct

D. I, II and III are correct

Answer:

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26. Benzylamine may be alkylated as shown in the following equation

$C_6H_5CH_2NH_2 + R - X \rightarrow C_6H_5CH_2NHR$

Which of the following alkyl halides is best suited for this reaction through S_N 1 mechanism?

A. CH_3Br

B. C_6H_5Br

C. $C_6H_5CH_2Br$

D. C_2H_5Br

Answer:

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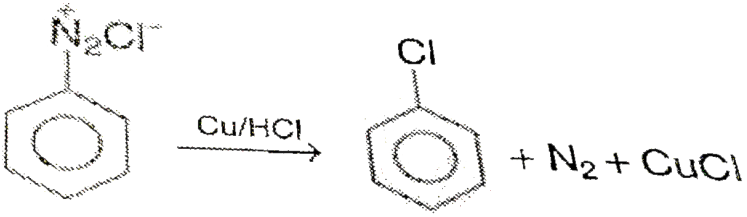
27. Consider the following reaction :



The above reaction is called

A. carbylamine reaction

B. Gattermann synthesis

C. Sandmeyer's reaction

D. Balz-Schiemann reaction

Answer:

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28. Identify the final product (z) in the following sequence of reactions

$$C_6H_5COOH \xrightarrow[(ii)\,PBr_3]{(i)\,LiAlH_4} X \xrightarrow{KCN} Y \xrightarrow{LiAlH_4} Z$$

A. $C_6H_5CH_2NH_2$

B. $C_6H_5CH_2CH_2NH_2$

C. $C_6H_5CH_2CH_2NH_2$

D. $C_6H_5 - \underset{\displaystyle CH_3}{\overset{\displaystyle |}{CH}} - NH_2$

Answer:

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29. Hydrolysis of phenyl isocyanide forms :

A. benzoic acid

B. formic acid

C. acetanilide

D. acetic acid

Answer:

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30. Which of the following on reaction with nitrous acid followed by treatment with NaOH produces a blood red colouration?

A. RCH_2NO_2

B. R_3CNO_2

C. R_2CHNO_2

D. $PhNO_2$

Answer:

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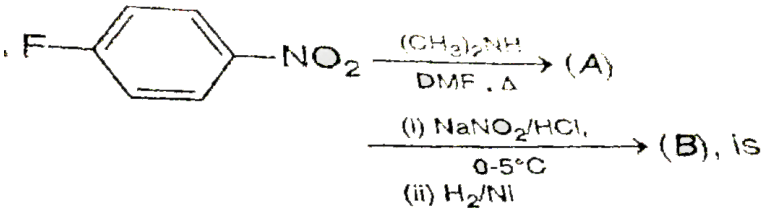
31. Complete the following reaction



A. 

B. 

C. 

D. 

Answer:

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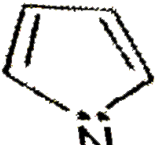
1. Arrange the following in correct order of basicity

I

II



III

A. $I > II > III$

B. $III > II > I$

C. $II > I > III$

D. $I > III > II$

Answer:

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2. $C_6H_5NH_2 \xrightarrow[180^\circ C]{H_2SO_4} \underset{\text{Para form}}{NH_2C_6H_4(SO_3H)}$

The true statement about the product is

A. it does not exist as Zwitter ion

B. it does not act as inner salt

C. $-SO_3$ diminishes the basic character of $-NH_2$

D. $-NH_2$ displays a powerful basic character

Answer:

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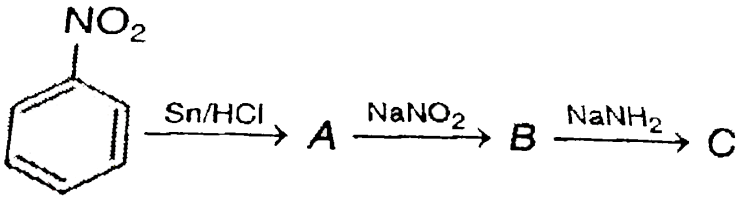
3. Identify C in the following reaction:



A. benzamide

B. benzoic acid

C. chlorobenzene

D. aniline

Answer:

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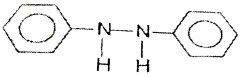
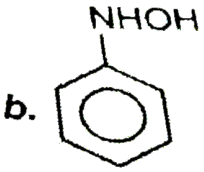
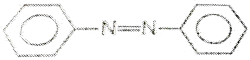
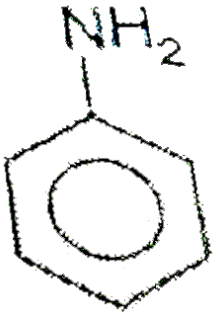
4. The structure of the compound formed, when nitrobenzene is reduced by lithium aluminium hydride $(LiAlH_4)$ is

A. 

B. 

C. 

D. 

Answer:

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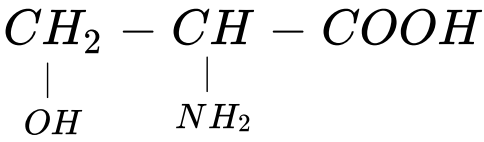
5. The IUPAC name of the compound,



A. 2-amino-3-hydroxy propanoic acid

B. 1-hydroxy-2-aminopropan-3-oic acid

C. 1-amino-2-hydroxypropanoic acid

D. 3-hydroxy-2-amino propanoic acid

Answer:

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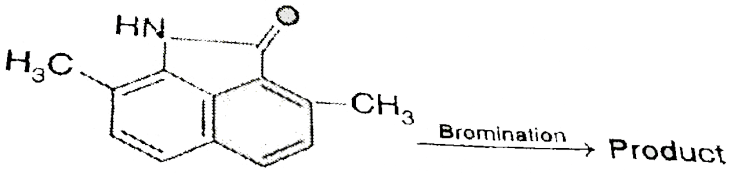
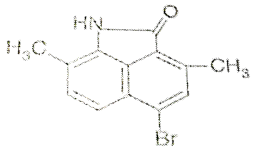
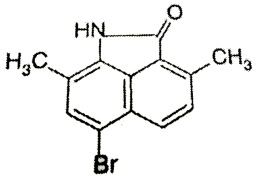
6. Complete the following reaction

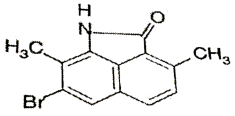


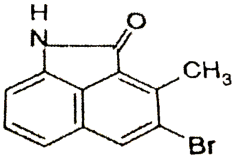
A.



B.



C. 

D. 

Answer:

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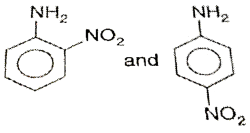
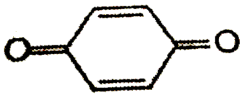
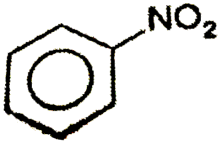
7. Aniline reacts with conc. HNO_3 to give

A. 

B. 

C. 

D. 

Answer:

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