NITROGEN CONTAINING ORGANIC COMPOUNDS

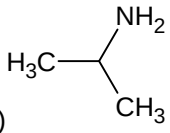
Single Correct Answer Type

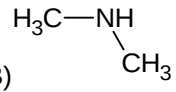
1. The Hinsberg test of a $C_5H_{14}N_2$ compound produces a solid that is insoluble in 10% aq. NaOH. This solid derivative dissolves in 10% aq. sulfuric acid. Which of the following would best fit these facts?

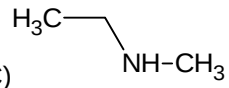
(A) $NH_2CH_2CH_2CH_2N(CH_3)_2$ (B) $(CH_3)_2NCH_2CH_2NHCH_3$

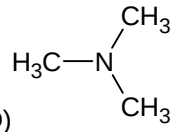
(C) $NH_2CH_2C(CH_3)_2CH_2NH_2$ (D) $(CH_3)_2NCH_2N(CH_3)_2$

2. Which will give positive isocyanide test


(A)


(B)


(C)

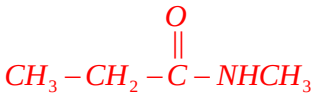

(D)

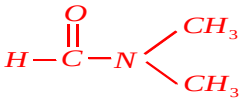
3. Which of the following reaction can produce aniline as the main product?

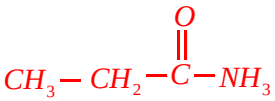
(A) $C_6H_5NO_2$ + Zn/KOH (B) $C_6H_5NO_2$ + Zn/NH_4Cl

(C) $C_6H_5NO_2$ + Li Al H_4 (D) $C_6H_5NO_2$ + Sn/HCl

4. An organic compound upon hydrolysis produces two compounds one product gave silver mirror test, other product reacts with Hinsberg reagent to produce an alkali insoluble product. The organic compound is

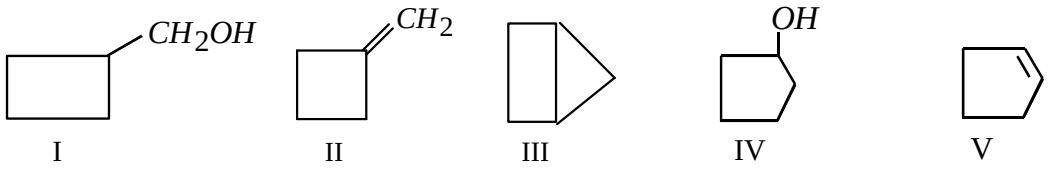
(A) 

(B) 

(C) 

(D) 

5. Treatment of cyclobutylmethanamine with nitrous acid doesn't give



I II III IV V

(A) I, II, IV (B) II, V, I (C) I, II, IV, V (D) III only

6. Each pair has been matched with the suitable reagent used for making distinction. Which pair has been matched wrongly?

	Pair	**Reagent**
(A)	$R-C\equiv CH$ and $R-CH=CH_2$	$AgNO_3 / NH_4OH$
(B)	$R-CHO$ and $RCOOH$	$2,4-DNP$
(C)	$RCOOH$ and $RCONH_2$	$NaHCO_3$
(D)	$R-NH_2$ and $Ph-NH_2$	$CHCl_3 / NaOH$

7. The number of monochloro derivatives that the compound 'D' can give

$$CH_3CN \xrightarrow{H_3O^+,H^+} A \xrightarrow{Ca} B \xrightarrow{drydistillation} C \xrightarrow{Zn-Hg,HCl} D$$

(A) 3 (B) 4 (C) 2 (D) 1

8. Which of the following sequence of reagent is the good means to furnish the conversion ?

$R-CH_2OH \longrightarrow R-CH_2NH_2$

(a) $KMnO_4, SOCl_2, NH_3, \Delta, NaOBr$ (b) $SOCl_2, NaCN, H_2/Ni$

(c) CrO_3 in dilute acetone, NH_3, H_2, Ni (d) $Cu, 300^0C$, NH_3, $LiAlH_4$

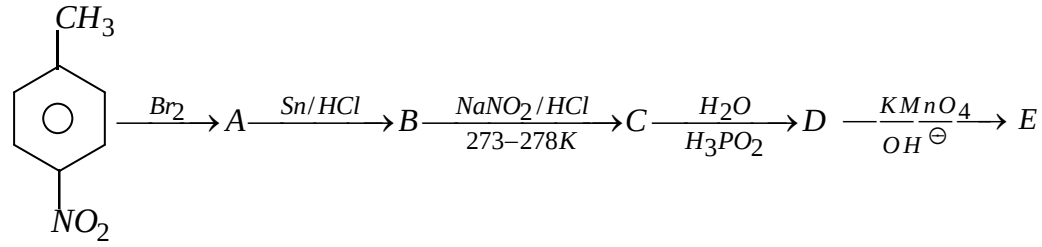
(A) a, b, c, d (B) a, b, c (C) b, c, d (D) c, d

9. Among the following donors the one that forms most stable adduct with the Lewis acid $B(CH_3)_3$ is

(A) 4-methyl pyridine (B) 2,6-dimethyl pyridine

(C) 4- nitro pyridine (D) 2,6-di-tert-butyl pyridine

10.

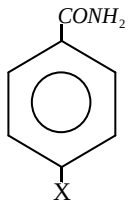


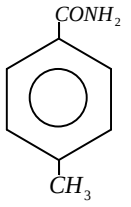
What is E ?

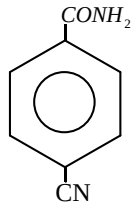
(A) 2-bromobenzoic acid (B) 1- bromobenzoic acid

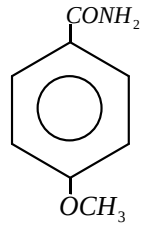
(C) 4 -bromobenzoic acid (D) 3 -bromobenzoic acid

11. Which of the following can undergo Hoffmann reaction most easily?

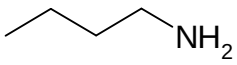
(A) 

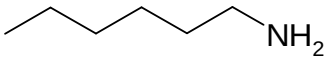
(B) 

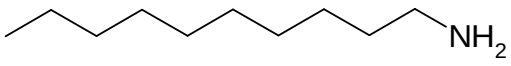
(C) 

(D) 

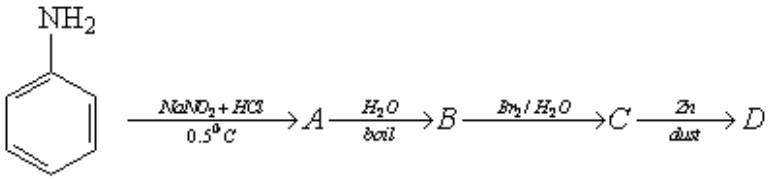
12. During the Hinsbergs Test, which of the following primary amines is most likely to be detected as a secondary amine?

(A) $MeNH_2$ (B) 

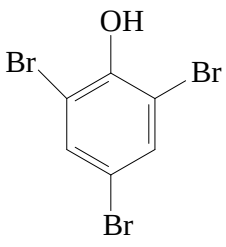
(C) 

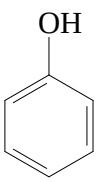
(D) 

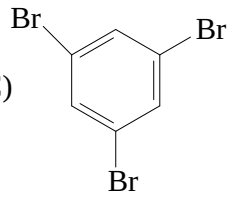
13.

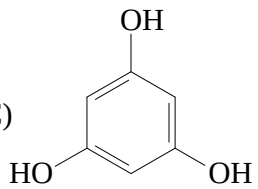


Compound 'D' is

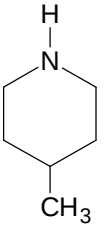
A) 

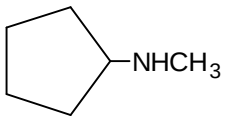
B) 

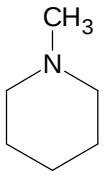
C) 

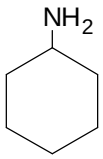
C) 

14. The amines shown are isomers. Choose the one with the lowest boiling point

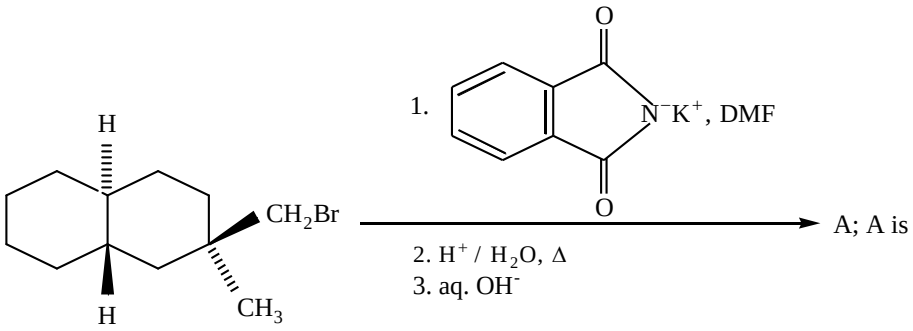
(A) 

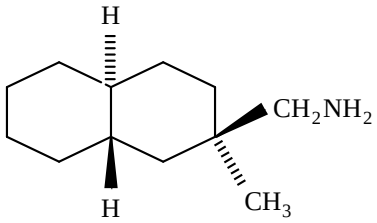
(B) 

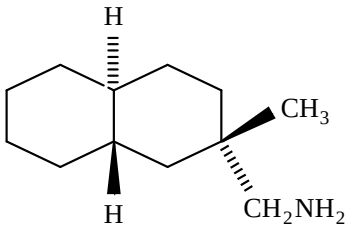
(C) 

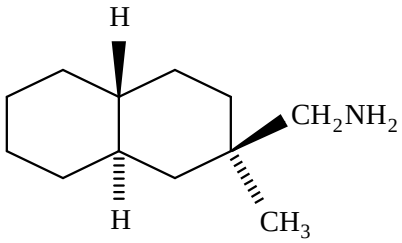
(D) 

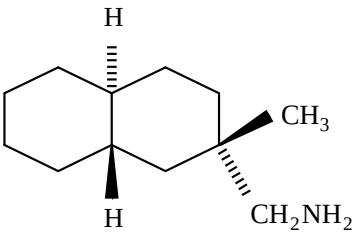
15.



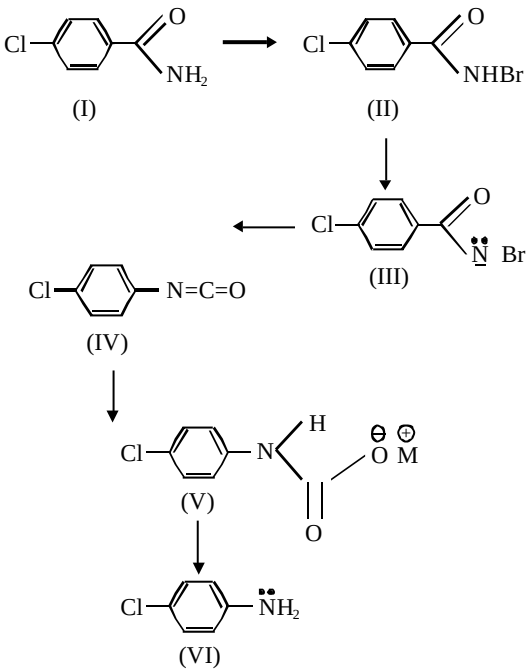
a) 

b) 

c) 

d) 

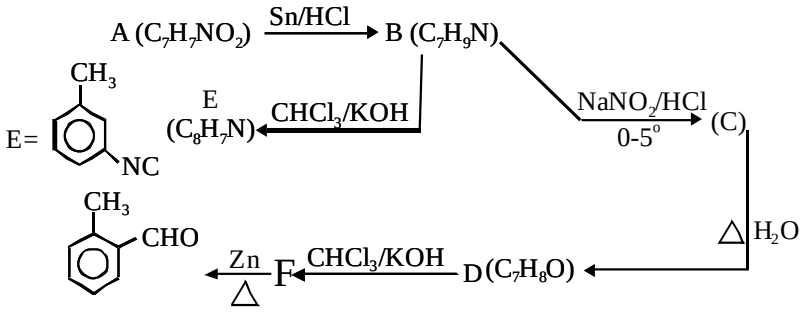
16. The mechanism of Hoffmann boromamide degradation is given below :

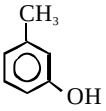
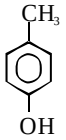
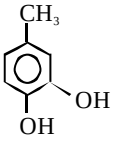
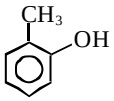


Which is the rate determining step in Hoffmann bromamide degradation.

(A) formation of I (B) formation of (II) (C) formation of III (D) formation of (IV)

17. Identify F in the following reaction



(A)  (B)  (C)  (D) 

18. A basic volatile nitrogen compound (M.wt-59) gave a foul smelling gas when treated with chloroform and alcoholic potash. A sample of the substance dissolved in aqueous HCl and treated with HCL and $NaNO_2$ solution at 0°C liberated a colourless gas. After the solution of gas was complete the aqueous solution was distilled to give an organic compound which does not contain nitrogen and which on warming with alkali and Iodine gave a yellow precipitate. Identify the original substance. Assume that it contains one N atom per molecule.

(A) $CH_3-\underset{\displaystyle NH_2}{\underset{|}{CH}}-CH_3$ (B) $CH_3CH_2-CH_2-NH_2$

(C) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{N}}-CH_3$ (D) $CH_3-\underset{\displaystyle CH_3}{\overset{|}{N}}-CH_2-CH_3$

19. An amine C_3H_9N reacts with Hinsberg's reagent to give a product which is insoluble in aqueous KOH. The amine is

(A) $C_2H_5-CH_2-NH_2$ (B) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{HC}}-CH_2-NH_2$

(C) $C_2H_5-NH-CH_3$ (D) $(CH_3)_3N$

20. Ethylamine and diethylamine cannot be differentiated by

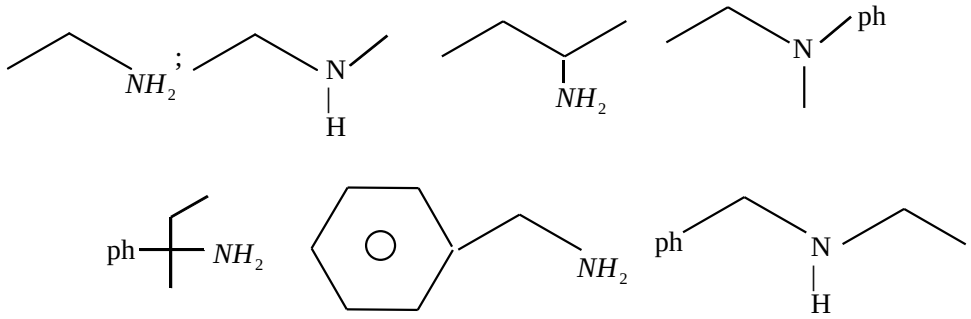
(A) Hinsberg test (B) Carbylamine test (C) iodoform test (D) both (A) and (B)

Numerical based

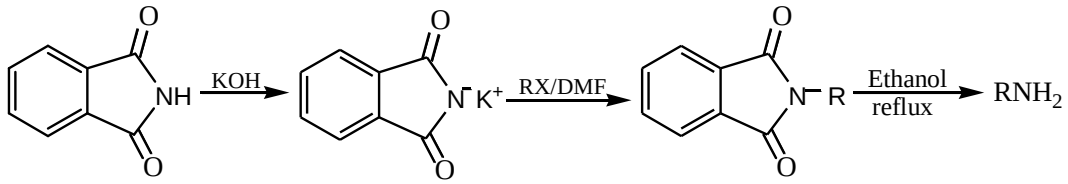
21. The number of moles of NaOH consumed in the following one mole of amide conversion:

i.e $R-\overset{\displaystyle O}{\overset{\|}{C}}-NH_2 \xrightarrow{Br_2+NaOH} R-NH_2$

22. How many of the following can give mustard oil smell in Hoffman mustard oil reaction

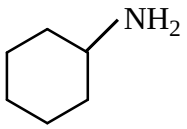


23.

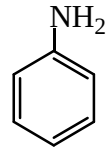


Out of the given amines, how many cannot be prepare by this method

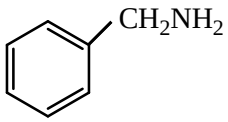
1) $CH_3CH_2NH_2$ 2) CH_3NHCH_3 3) $CH_2 = CH - NH_2$ 4)



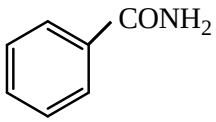
5)



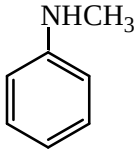
6)



7)

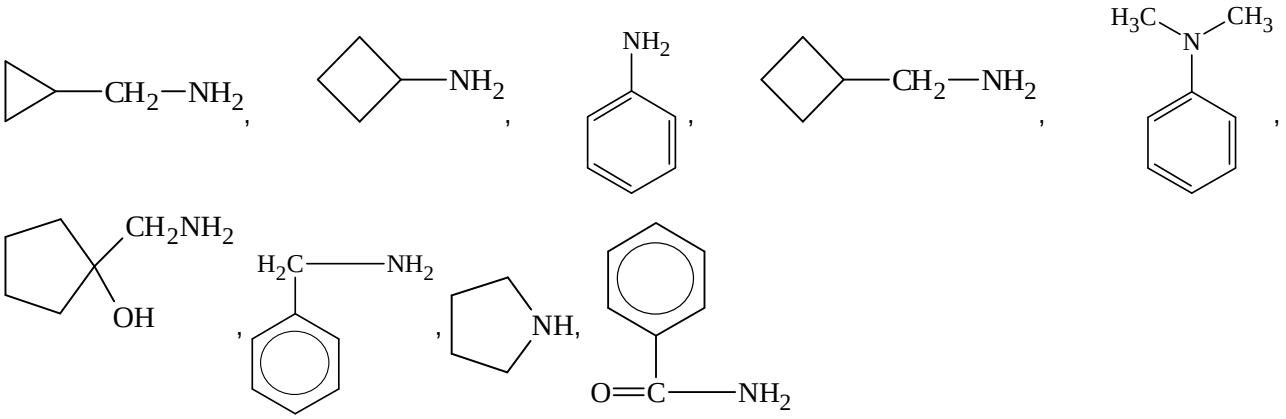


8)



24. Among $R–CH_2–NO_2$, $Ph–NO_2$, $Ph–CH_2–NO_2$, $R_2CH–NO_2$ and $R_3C–NO_2$, how many compounds with give blue colour when treated with HNO_2 followed by NaOH

25. How many of the below listed compounds on treatment with HNO_2 would go for ring expansion?



KEY

1.	B	**2.**	A	**3.**	D	**4.**	B	**5.**	D
6.	D	**7.**	C	**8.**	D	**9.**	A	**10.**	A
11.	D	**12.**	D	**13.**	C	**14.**	C	**15.**	A
16.	D	**17.**	A	**18.**	A	**19.**	C	**20.**	C
21.	4	**22.**	4	**23.**	4	**24.**	1	**25.**	3