10

AMINES

Level - 1

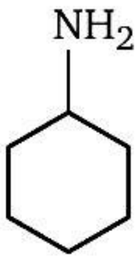
1. In which of the following reaction cyanide will be obtained as a major product ?

(a) $Ph-\overset{\overset{O}{\|}}{C}-CH_3 \xrightarrow[(ii)\ H_3O^+]{(i)\ LiAlH_4}$

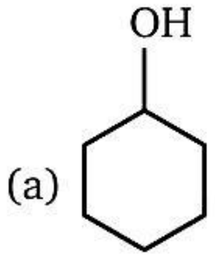
(b) $Ph-\overset{\overset{O}{\|}}{C}-NH_2 \xrightarrow[Br_2]{NaOH}$

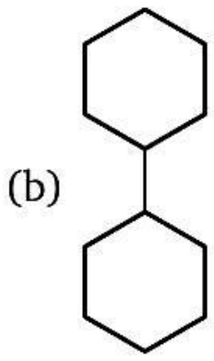
(c) $Ph-\overset{\overset{O}{\|}}{C}-NH_2 \xrightarrow{P_4O_{10}}$

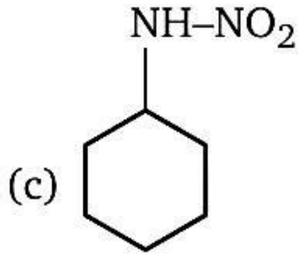
(d) $Ph-\overset{\overset{O}{\|}}{C}-O-H \xrightarrow{SOCl_2} \xrightarrow{NH_3}$

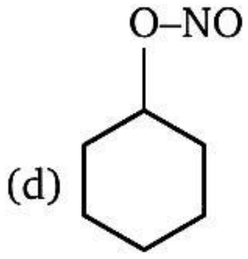
2.  $\xrightarrow{HNO_2}$ *A* (Major) :

Product (*A*) is :

(a) 

(b) 

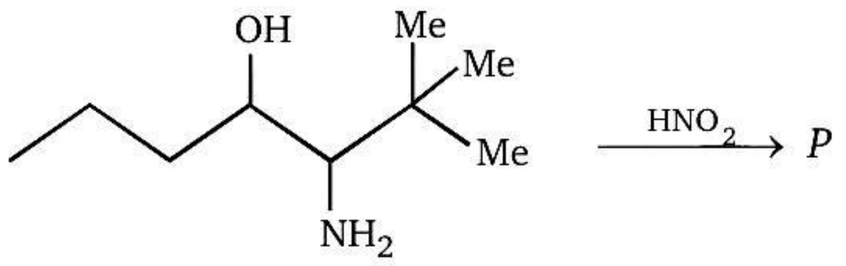
(c) 

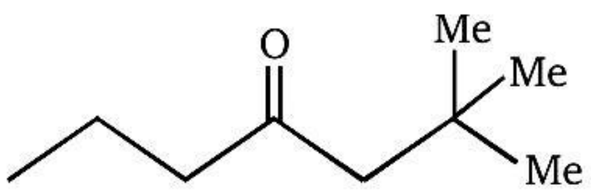
(d) 

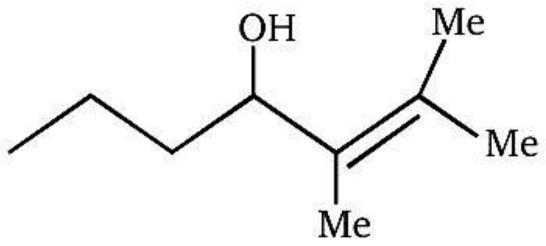
3. Which of the following alkene cannot be prepared by de-amination of *n*-Bu – NH_2 (n-Butyl) with $NaNO_2/HCl$?

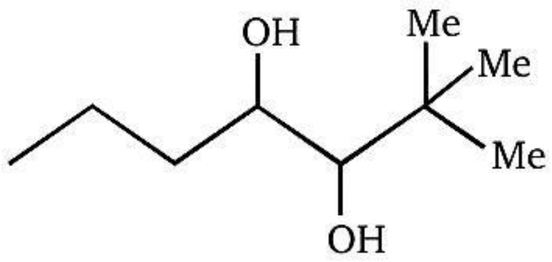
(a) 1-butene (b) *cis*-2-butene (c) *trans*-2-butene (d) Iso-butene

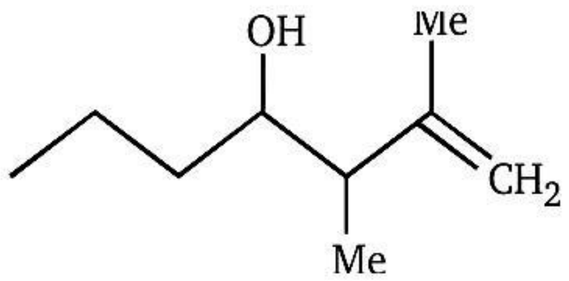
4. Predict the major product *P* in the following reaction.

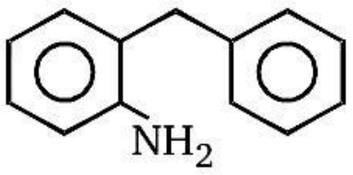


(a) 

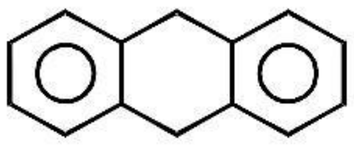
(b) 

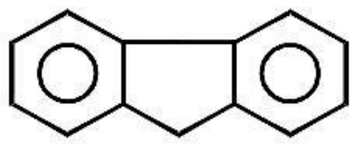
(c) 

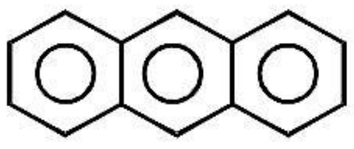
(d) 

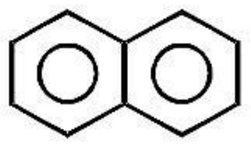
5. 

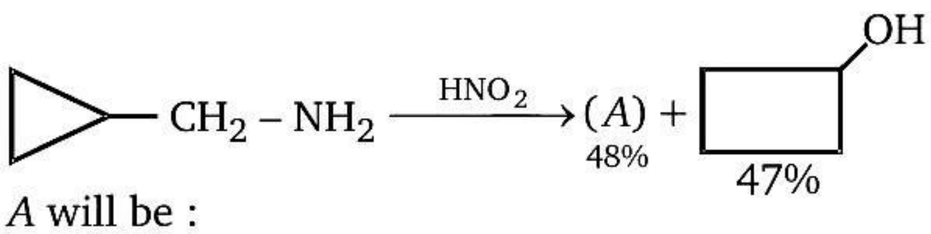
$\xrightarrow[H_2SO_4]{NaNO_2}$ (*A*); Product of this reaction is :

(a) 

(b) 

(c) 

(d) 

6. 

A will be :

(a) $CH_2=CH-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_3$

(b) 

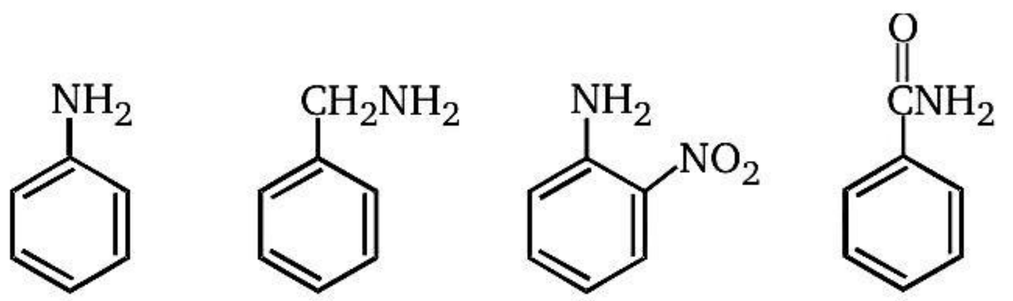
(c) 

(d)

7. Which of the following isomers of C_8H_9NO is the weakest base ?

(a) *o*-Aminoacetophenone (b) *p*-Aminoacetophenone
(c) *m*-Aminoacetophenone (d) Acetanilide

8. Rank the following compounds in order of increasing basic strength. (weakest → strongest) :

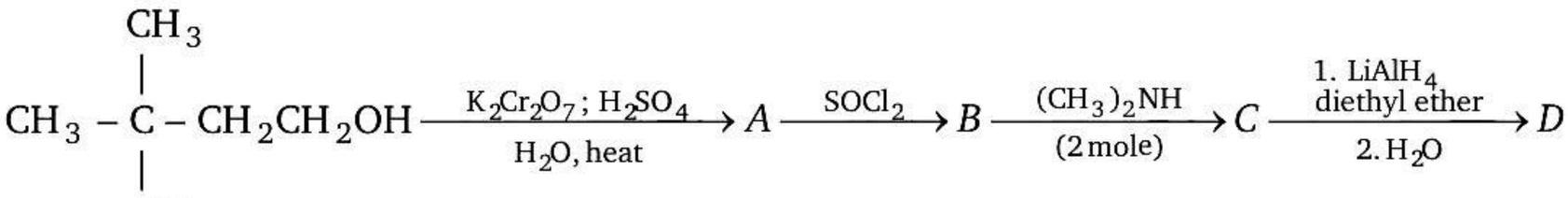


(a) 4 < 2 < 1 < 3 (b) 4 < 3 < 1 < 2 (c) 4 < 1 < 3 < 2 (d) 2 < 1 < 3 < 4

9. Which of the following arylamines will not form a diazonium salt on reaction with sodium nitrite in hydrochloric acid ?

(a) *m*-Ethylaniline (b) *p*-Aminoacetophenone
(c) 4-Chloro-2-nitroaniline (d) *N*-Ethyl-2-methylaniline

10. Identify product *D* in the following reaction sequence :



(a) $CH_3CCH_2C{\equiv}N$ (with CH_3 on the central C and another CH_3)

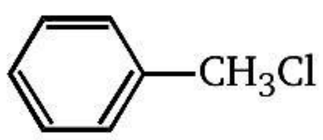
(b) $CH_3CCH_2CH_2N(CH_3)_2$ (with CH_3 on the central C and another CH_3)

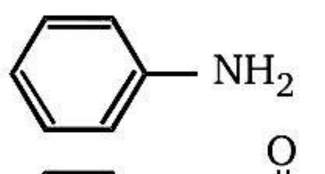
(c) $CH_3CCH_2CHN(CH_3)_2$ (with CH_3 and $N(CH_3)_2$ on the central C, and CH_3 on the CH)

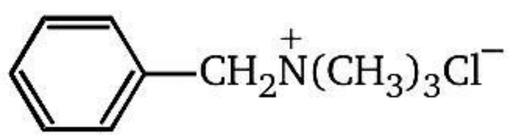
(d) $CH_3CCH_2CHN(CH_3)_2$ (with CH_3 on the central C, and OH on the CH)

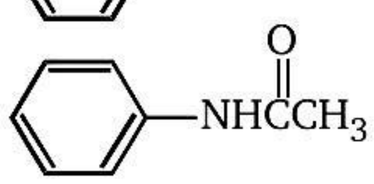
11. Which one of the following is best catalyst for the reaction shown below ?

$$CH_3(CH_2)_8CH_2Br \xrightarrow[\text{benzene}]{KCN} CH_3(CH_2)_8CH_2CN$$

(a) 

(b) 

(c) 

(d) 

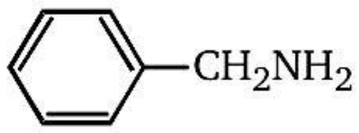
12. The major products obtained from the following sequence of reactions are :

$$(CH_3)_2CHCH_2N(CH_2CH_3)_2 \xrightarrow{CH_3I} \xrightarrow[H_2O]{Ag_2O} \xrightarrow{heat} \text{products}$$

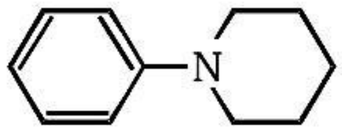
(a) $(CH_3)_2CHCH_2NH_2 + H_2C{=}CH_2$ (b) $(CH_3)_2NCH_2CH_3 + H_2C{=}C(CH_3)_2$

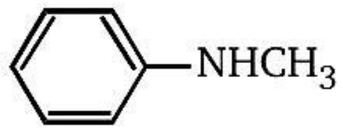
(c) $(CH_3)_2CHCH_2N(CH_3)CH_2CH_3 + H_2C{=}CH_2$ (d) $(CH_3)_3\overset{+}{N}CH_2CH_3I^- + H_2C{=}CH_2$

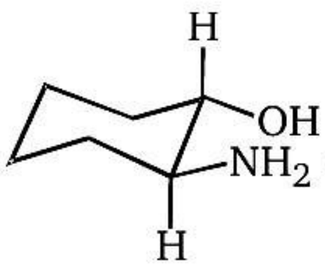
13. Which amine yields *N*-nitroso amine after treatment with nitrous acid ($NaNO_2$, HCl) ?

(a) 

(b) 

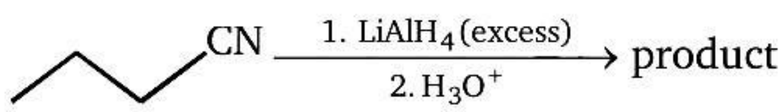
(c) 

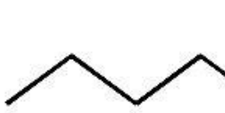
(d) 

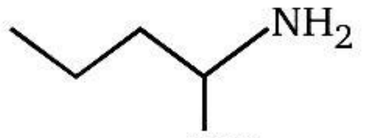
14.  (*A*); Product (*A*) is :

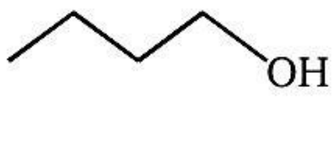
(a) cyclopentane carboxyaldehyde
(b) cyclohexane-1, 2-diol
(c) 2-aminocyclohexene
(d) cyclohex-2-enol

15. Choose the appropriate product for this reaction.



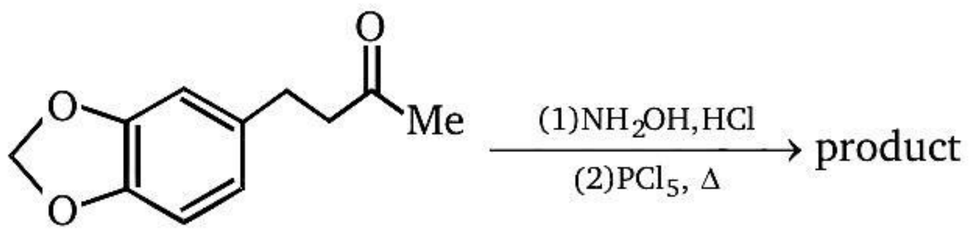
(a) 

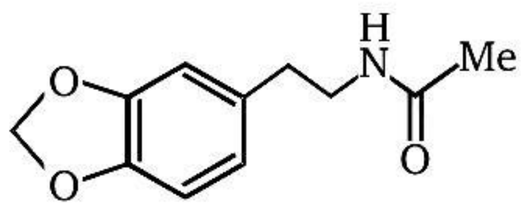
(b) 

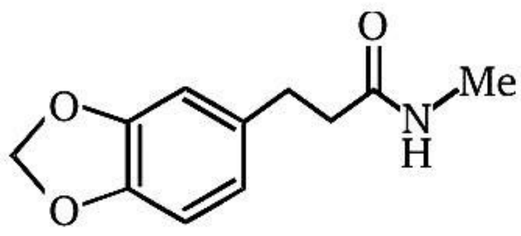
(c) 

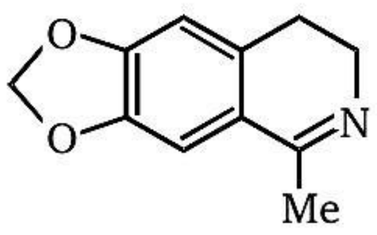
(d)

16. Which of the following product will be obtained in the given (consider minor product also) Beckmann-type rearrangement ?



(a) 

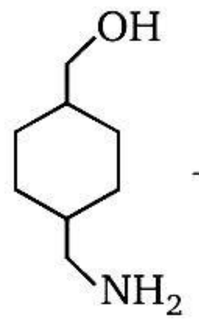
(b) 

(c) 

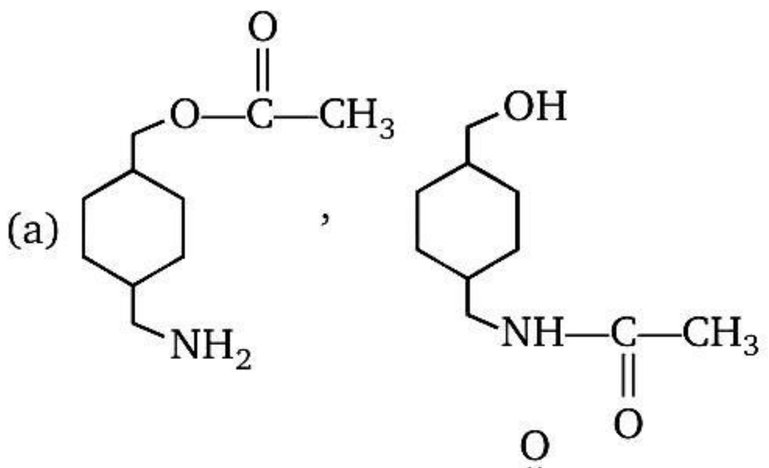
(d) all of these

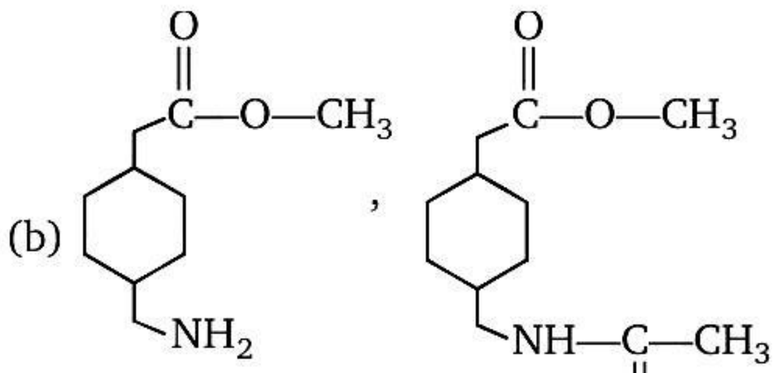
17. Deamination (or) diazotization of *n*-Bu–NH_2 with $NaNO_2$/HCl gives ..... isomeric butene.

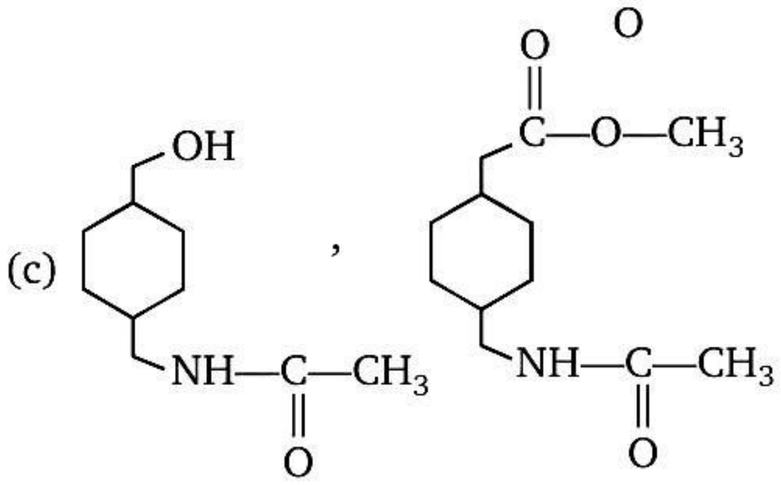
(a) 2 (b) 3 (c) 4 (d) 5

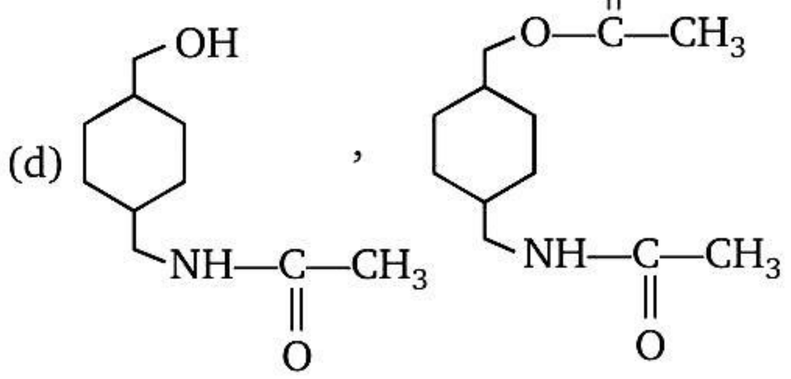
18. 


P and Q respectively are :

(a) 

(b) 

(c) 

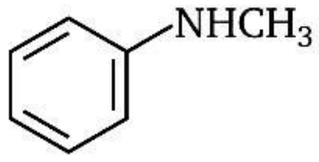
(d) 

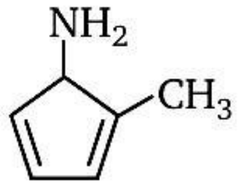
19. A nitrile X is treated with $LiAlH_4$ to obtain compound Y (C_2H_7N). In a separate reaction X is hydrolyzed in an acid medium to obtain Z. The product obtained after mixing Y and Z will be

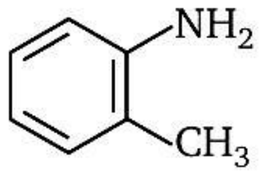
(a) $CH_3CONHCH_2CH_3$ (b) $CH_3CH_2CONHCH_2CH_3$

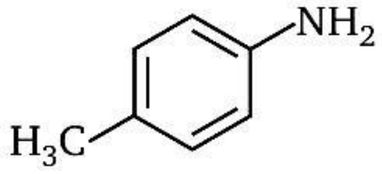
(c) $(CH_3COO^-)(CH_3CH_2NH_3^+)$ (d) $(CH_3CH_2COO^-)(CH_3NH_2^+)$

20. The compound $X(C_7H_9N)$ reacts with benzensulfonyl chloride to give $Y(C_{13}H_{13}NO_2S)$ which is insoluble in alkali. The compound X is:

(a) 

(b) 

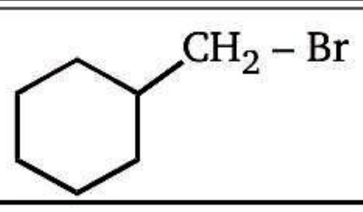
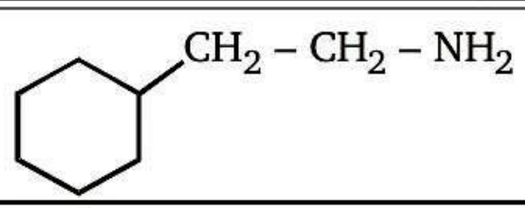
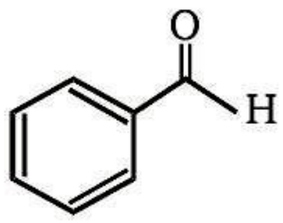
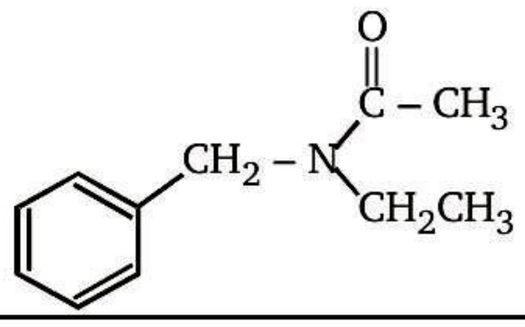
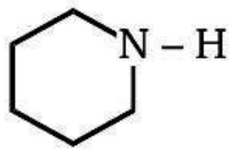
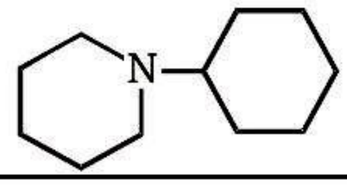
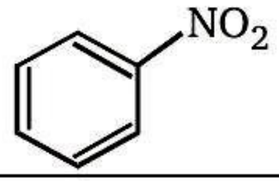
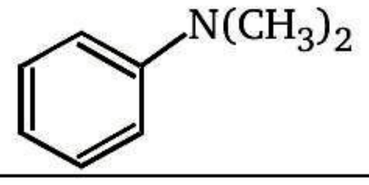
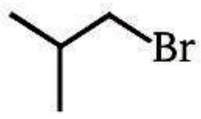
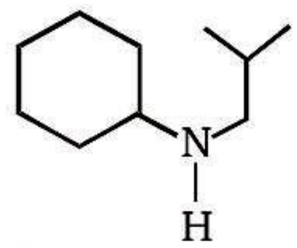
(c) 

(d) 

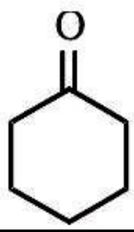
ANSWERS — LEVEL 1															
1.	(c)	**2.**	(a)	**3.**	(d)	**4.**	(a)	**5.**	(b)	**6.**	(b)	**7.**	(d)	**8.**	(b)
9.	(d)	**10.**	(b)	**11.**	(c)	**12.**	(c)	**13.**	(d)	**14.**	(a)	**15.**	(b)	**16.**	(d)
17.	(b)	**18.**	(d)	**19**	(c)	**20.**	(a)								

Level - 2

1. Five amine syntheses are outlined below. In each reaction box enter a single letter designating the best reagent and conditions selected from the list at the bottom of the page.

A.		First Step ☐ Second Step ☐	
B.		First Step ☐ Second Step ☐ Third Step ☐	
C.		First Step ☐ Second Step ☐	
D.		First Step ☐ Second Step ☐	
E.		First Step ☐ Second Step ☐ Third Step ☐ Fourth Step ☐	

(a)	(i) $LiAlH_4$ in ether (ii) H_2O & base
(b)	$C_2H_5NH_2$(cat. $H^{(+)}$)
(c)	NaCN in alcohol
(d)	H_2 & Ni catalyst or H_2 & Pd catalyst
(e)	NaN_3 in alcohol
(f)	$(CH_3CO)_2O$ & pyridine
(g)	C_2H_5Br

(h)	 , $H^{\oplus}$	
(i)	$2CH_3I$ & pyridine	
(j)	KOH in H_2O	

ANSWERS — LEVEL 2

1. A – c, a or c, d; B – b, d, f; C – h, d; D – d, i or a, i; E – e, a, h, a