

CHEMISTRY

BOOKS - CENGAGE CHEMISTRY (HINGLISH)

GRIGNARD REAGENTS AND ORGANOMETALLIC REAGENTS

Illustration

1. Explain why organocopper and organocadmium reagents react with less reactive acid chlorides even though they do not react with more reactive ketones.



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2. The reaction of $R' - \overset{\overset{O}{\parallel}}{C} - Cl$ with R_2CuLi or R_2Cd gives a ketone, but with $RMgX$ it gives a 3° alcohol.

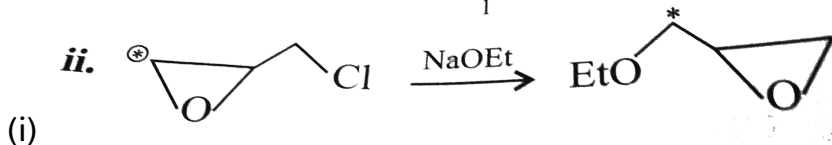
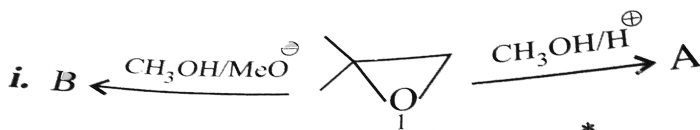
(a) Explain why $RMgX$ reaction does not give ketone.

(b) Account for the difference in behaviour of $RMgX$ and R_2CuLi or R_2Cd .

(c) What is the relationship between the reactivity of the organometallic compound and activity of the metal ?

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3. Explain or complete the following reactions.



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4. Synthesise the following :

(a) Benzyl alcohol from *G. R.*

(b) 2-Methyl-2-phenyl propanol from *G. R.*

(c) 2-Cyclopropyl ethanol from *G. R.*

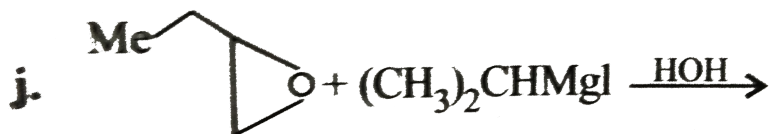
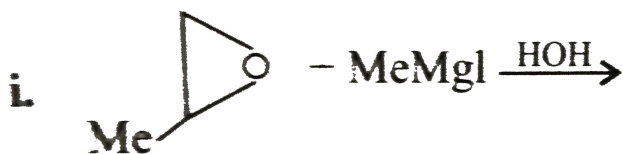
(d) α -Phenyl ethanol from *MeMgl.*

(e) 2-Butanol from acetaldehyde

(f) Triphenyl methanol from benzophenone

(g) α, α -Diphenyl ethanol from acetophenone

(h) 1-Cyclopropyl-1-phenyl ethanol from *PhMgBr.*

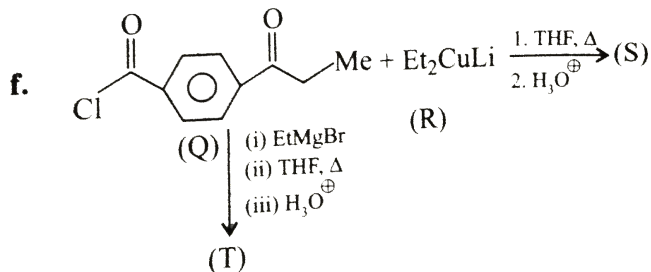
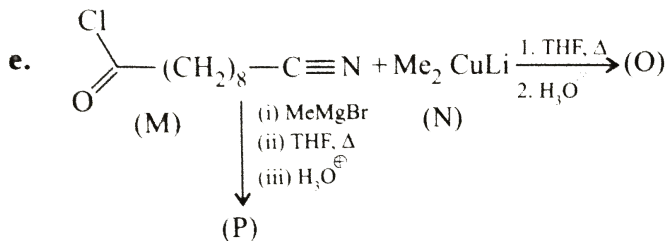
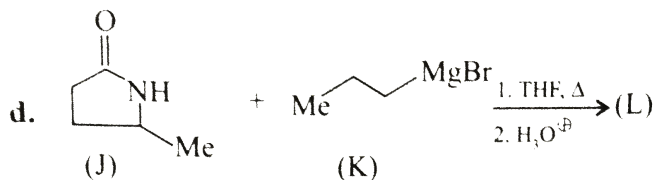
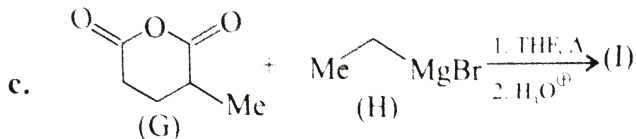
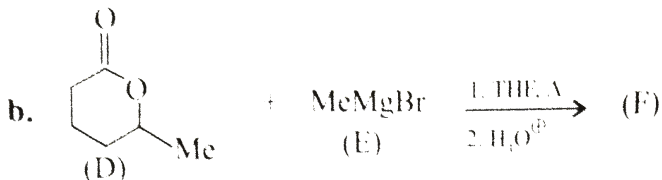
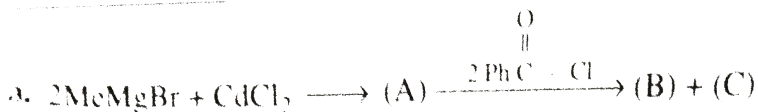
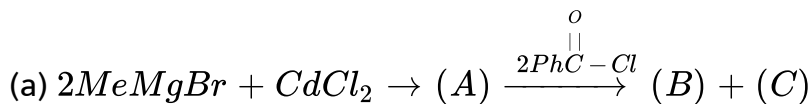


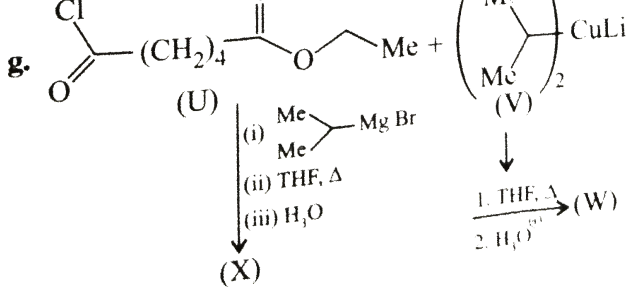
(i)



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5. Complete the following reactions :

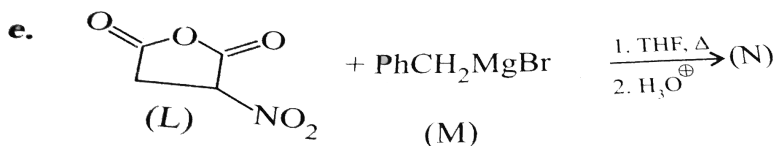
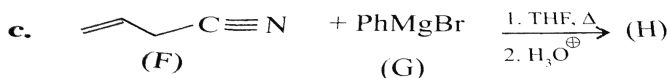
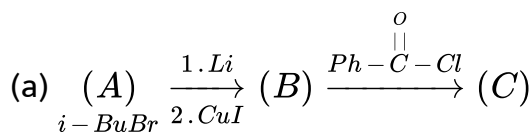




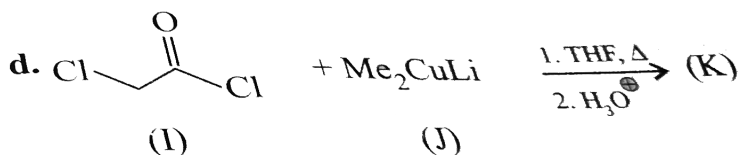
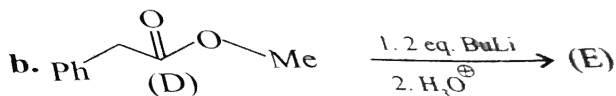
(b)

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6. Complete the following reactions :



(b)



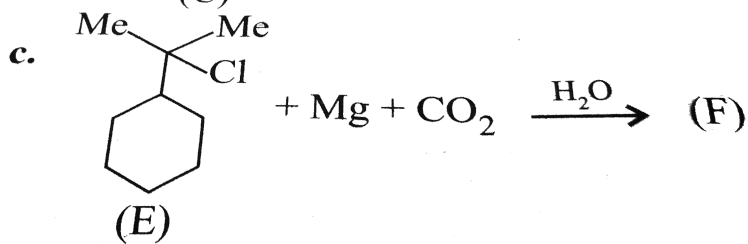
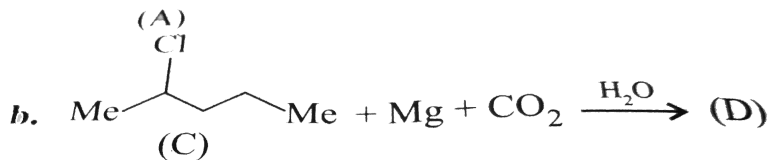
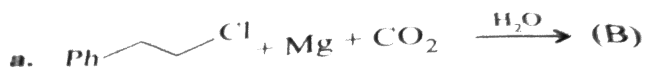
(c)

(d) 

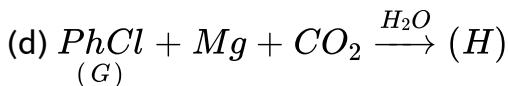
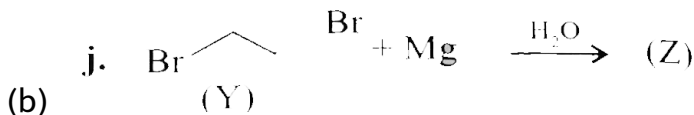
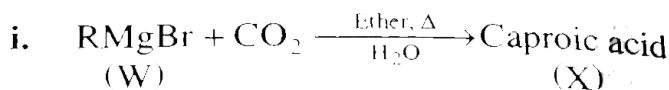
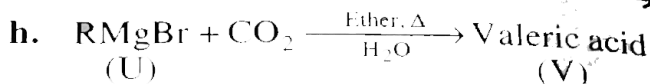
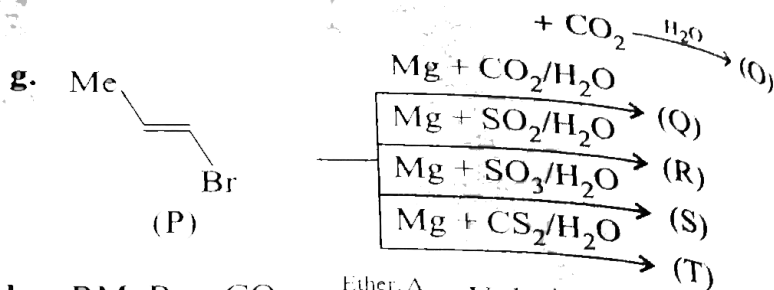
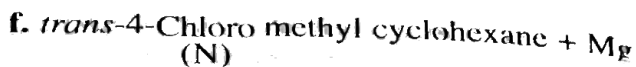
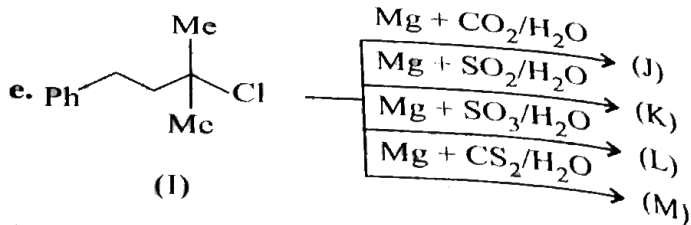
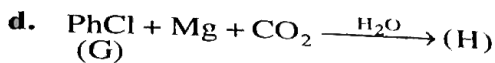
(e) 

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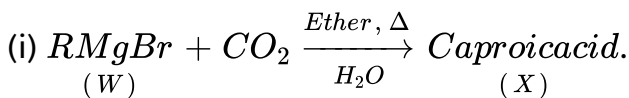
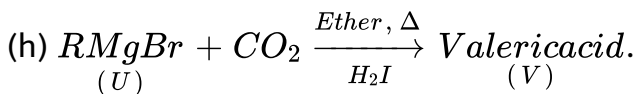
7. Complete the following reactions :



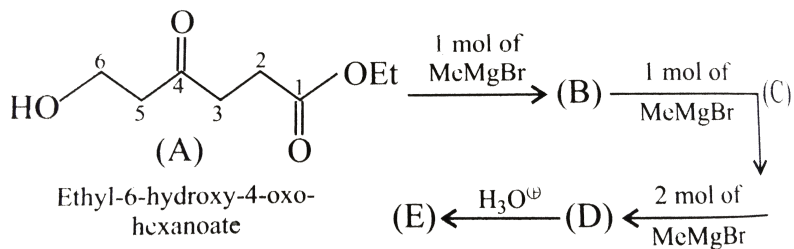
(a)



(g)

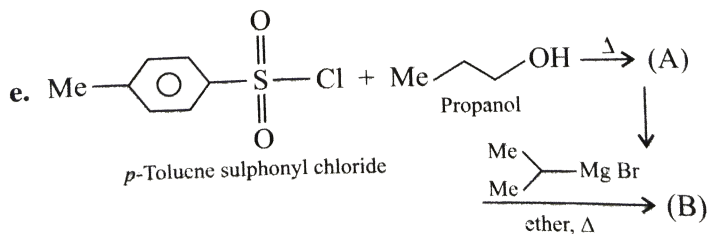
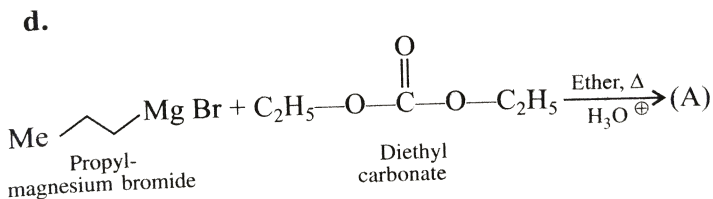
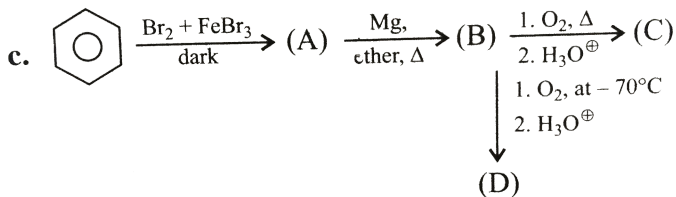
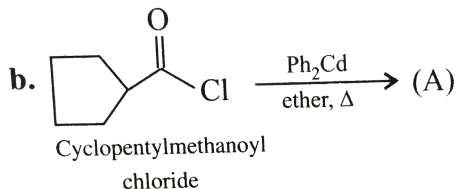
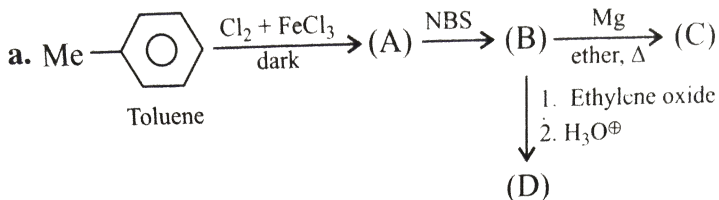


8. Identify the products.



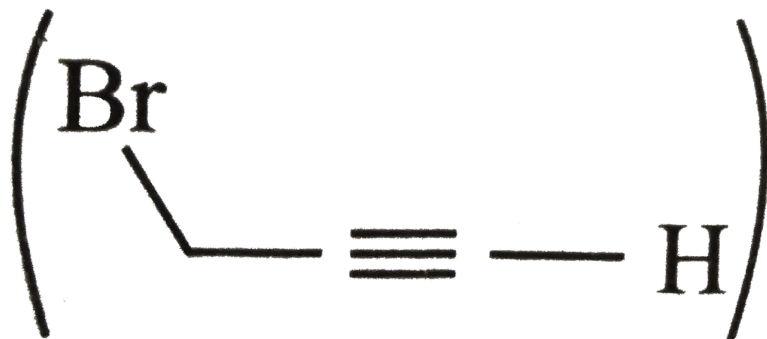
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9. Complete the following reactions :



(1) (a)

(2) Why cannot be *G. R* or lithium organometallic compounds of

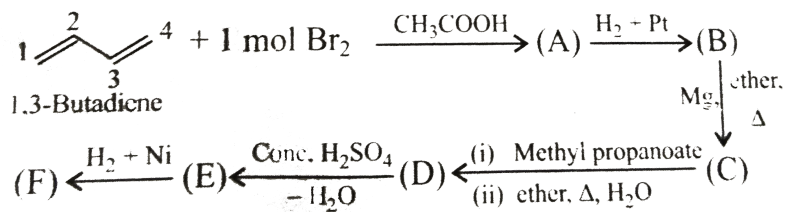


prepared ?

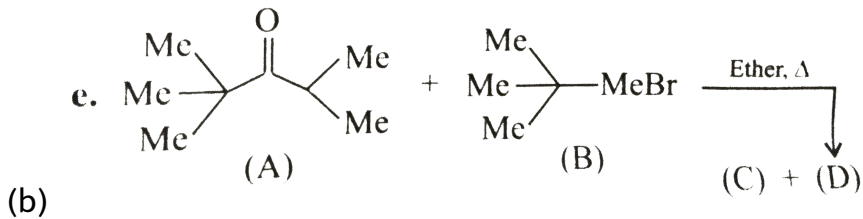
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10. Complete the following reactions :

c.

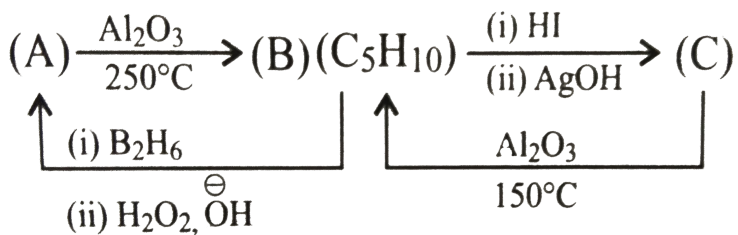


(a)

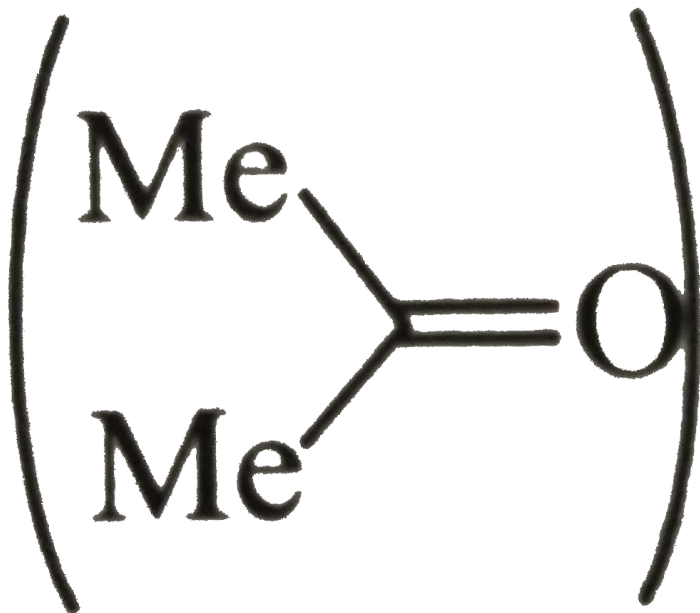


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Solved Examples



(A) and (C) are isomers, (B) can be obtained by the products of the reactions of EtMgBr and acetone

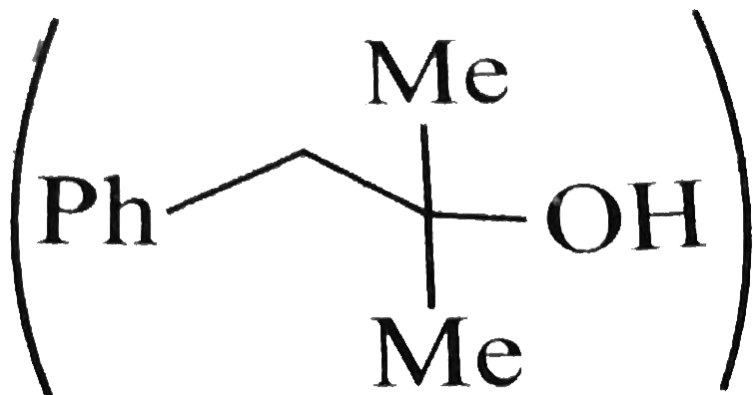


. Give the

structures of (A), (B), and (C).

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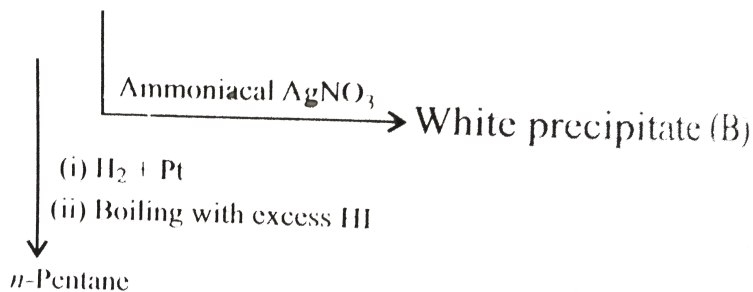
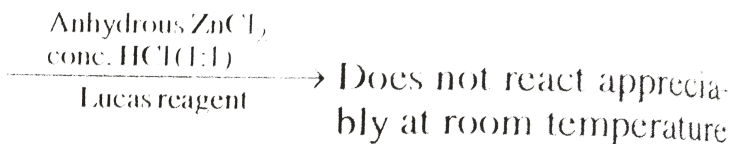
2. Two different *G. R.* (*A*) and (*B*) give the product (*X*)



on reaction

with (*C*) and (*D*) respectively. Give the structures of (*A*), (*B*), (*C*) and (*D*).

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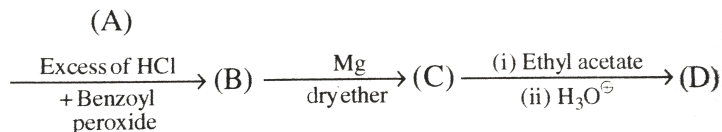


3.

A sample of 0.42 gm of (A) with excess of MeMgBr gives 224 ml of $\text{CH}_4(\text{g})$ at S.T.P. Give the structure of (A) and write the equations involved.

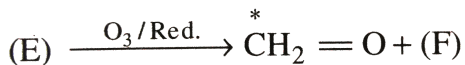
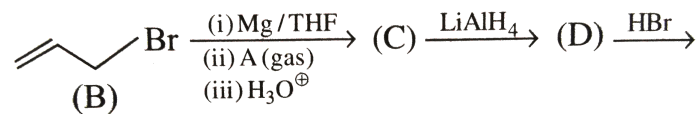
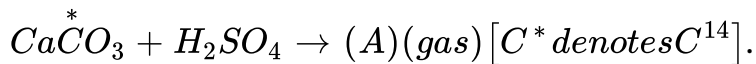
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4. Identify the structures of (A) to (D).



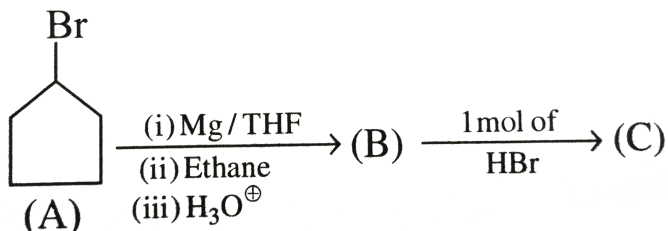
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5. Identify (A) to (F) and mark the C^* carbon in the entire scheme



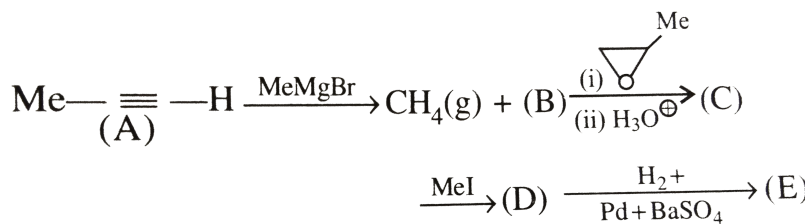
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6. Identify (A) to (C).



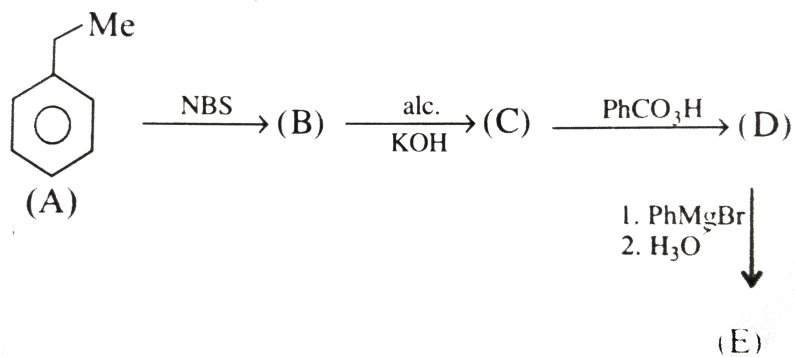
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7. Identify (A) to (E).



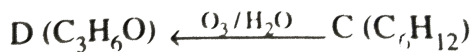
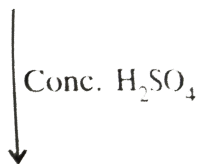
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8. Identify (A) to (E).

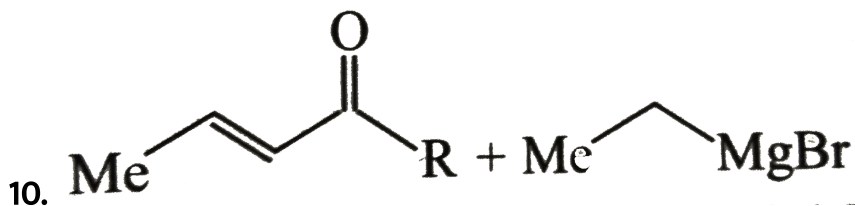


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9. Identify (A) to (D).

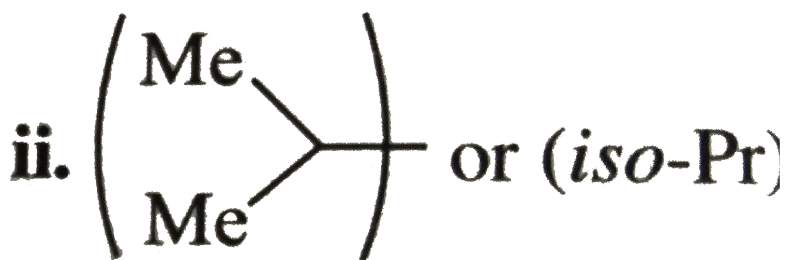


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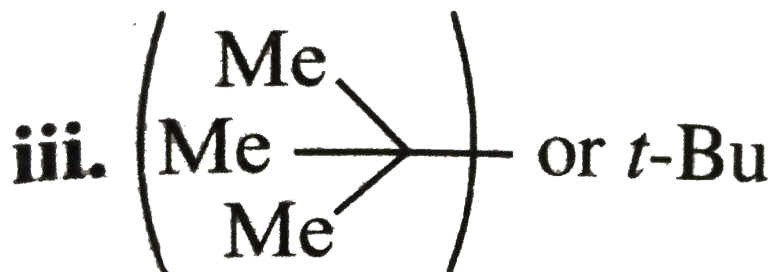


How would the ratio of products change if.

(i) $R = Et$

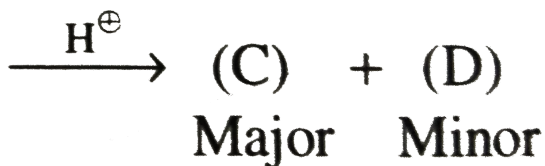
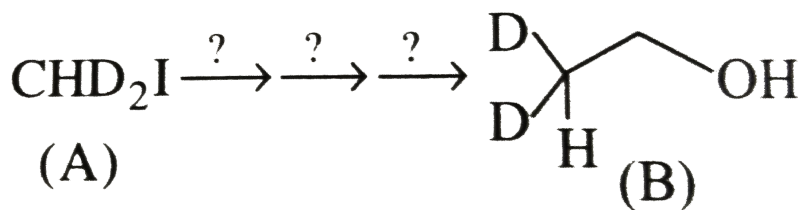


(ii)



(iii)

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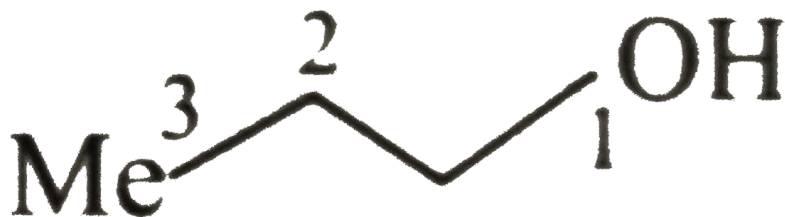
11. Convert

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12.

Starting

with



(Propanol)

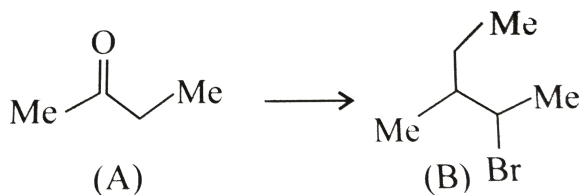


and

(ethanol). Prepare *pent* - 2 - *e* ≠ using *G. R.* Is there more than one way? If so, which is the best and why?

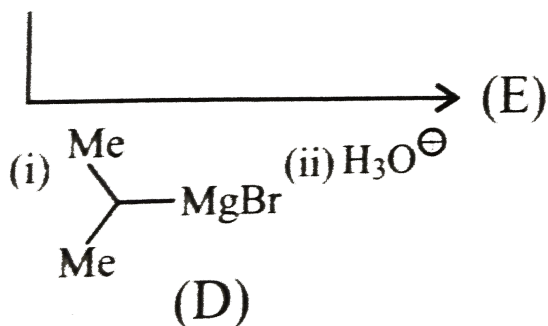
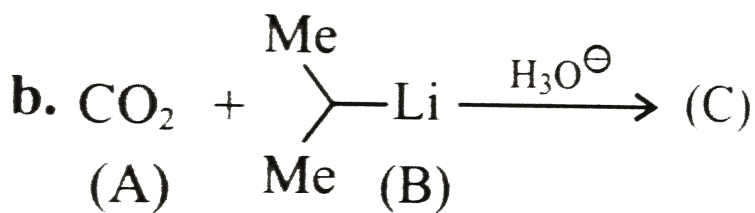
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13. Complete the following reaction using *G. R* and any other compound.

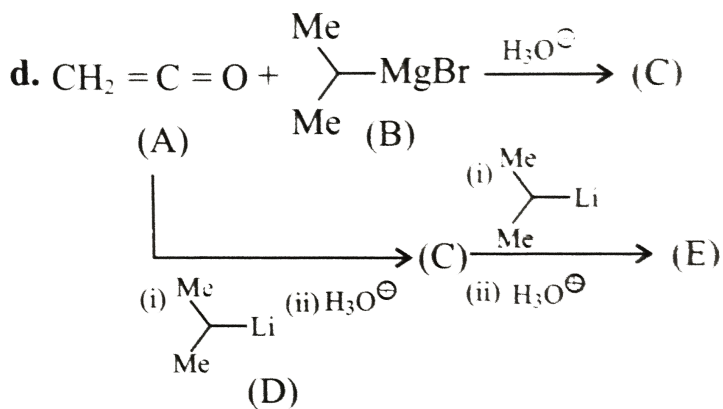


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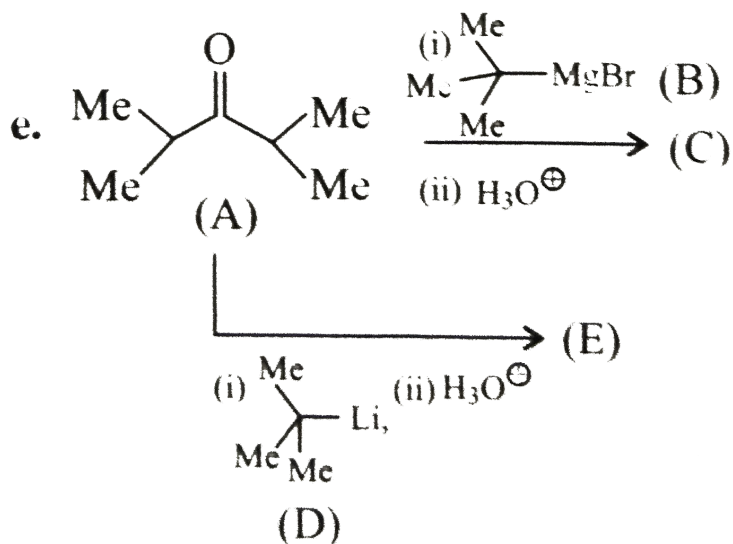
14. Complete the following reactions :



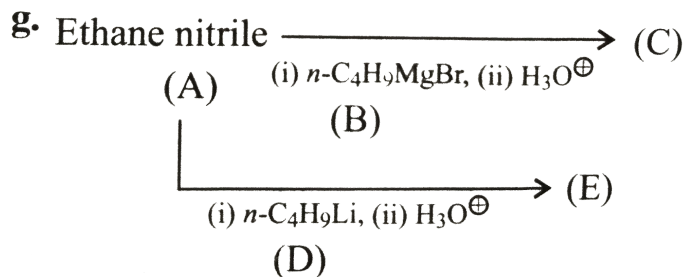
(a)



(b)



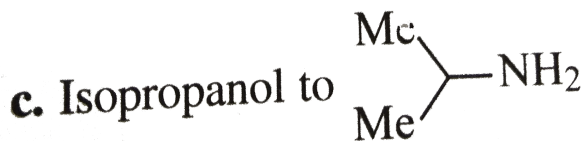
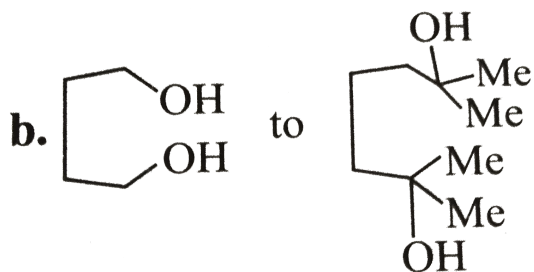
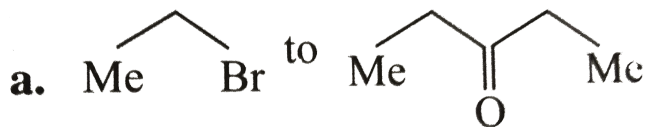
(c)



(d)

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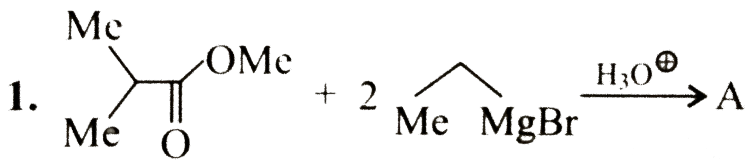
15. Convert the following reactions by using *G. R.*



(a)

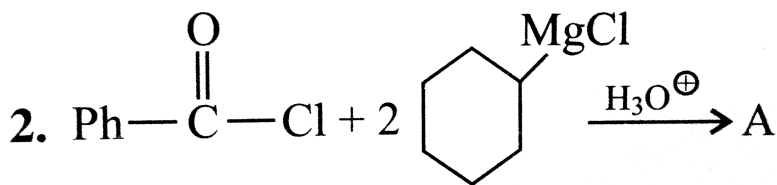
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Exercises (Subjective)



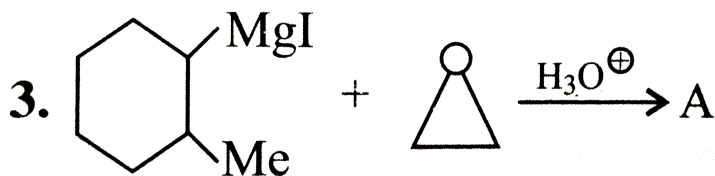
1.

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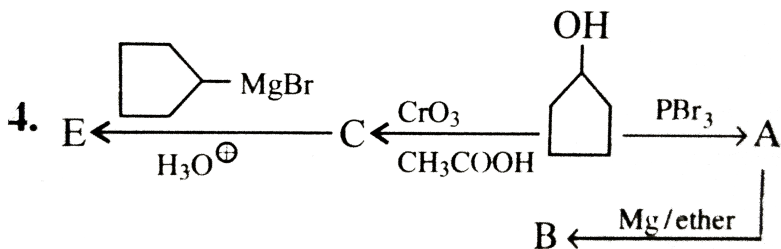
2.

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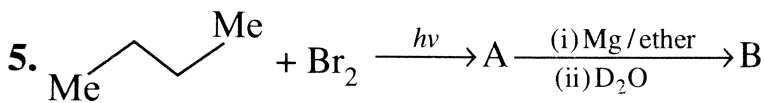
3.

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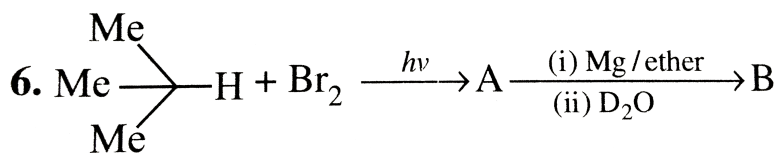
4.

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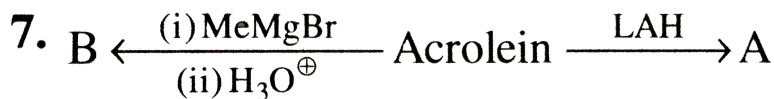
5.

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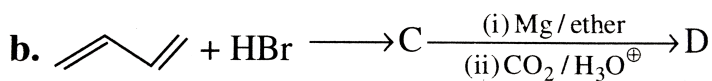
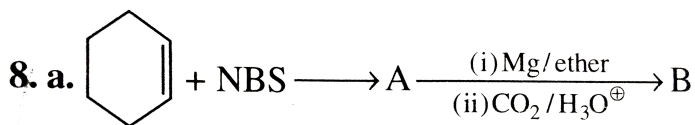
6.

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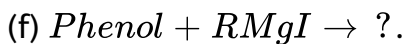
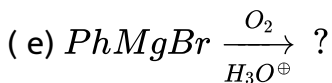
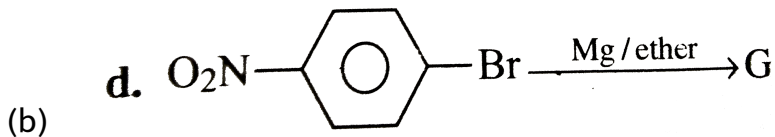
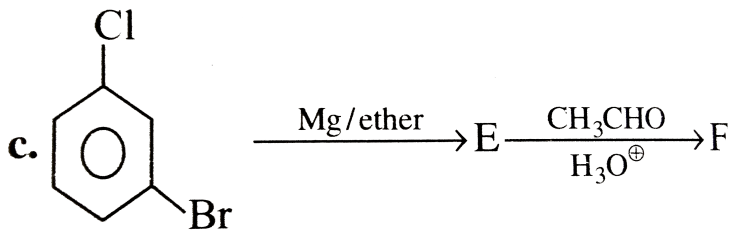


7.

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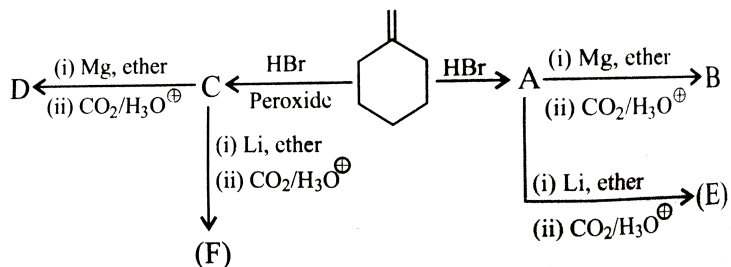


8. (a)



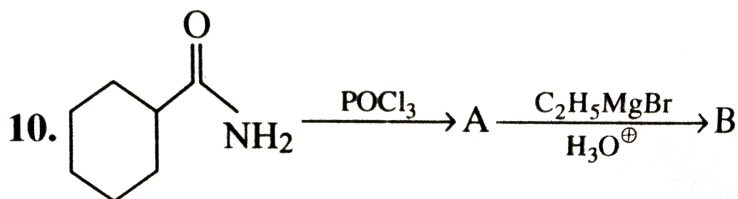
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9.



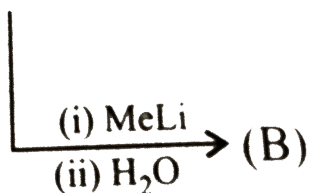
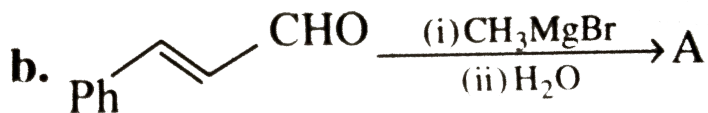
9.

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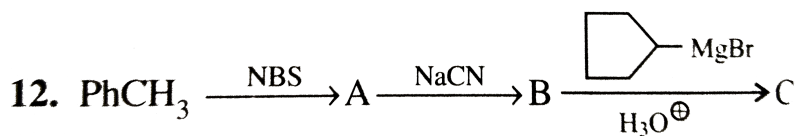
10.

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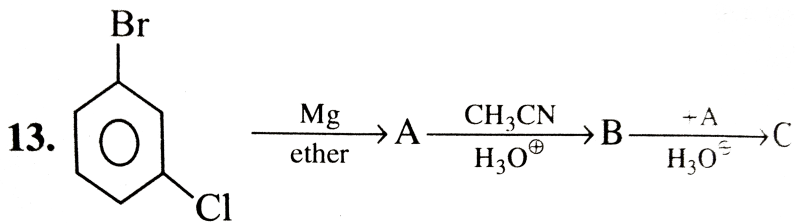
11. (a)

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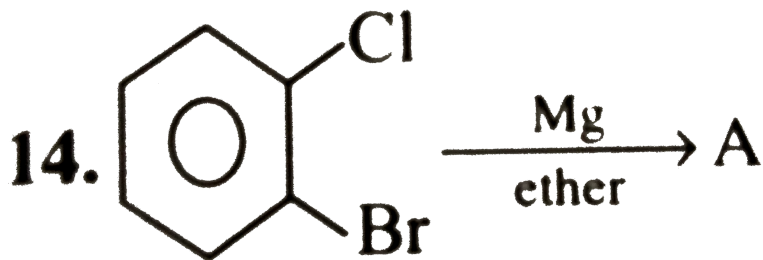
12.

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13.

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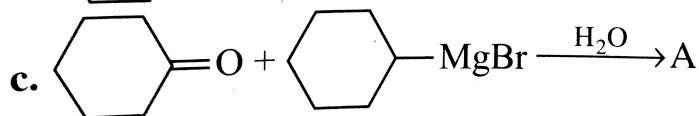
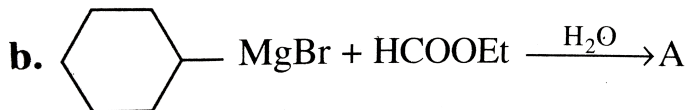
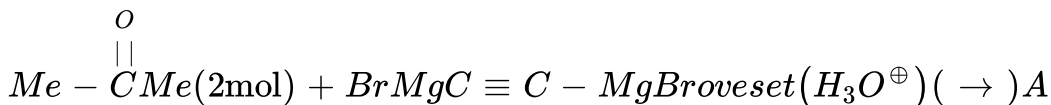


14.

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15.

(a)

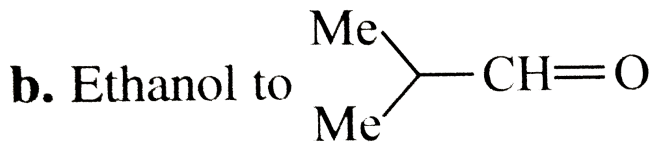
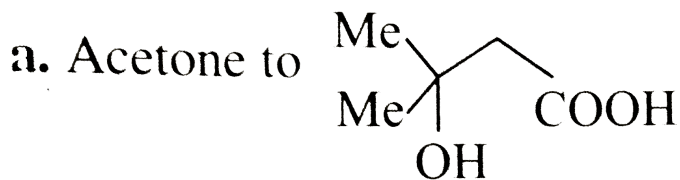


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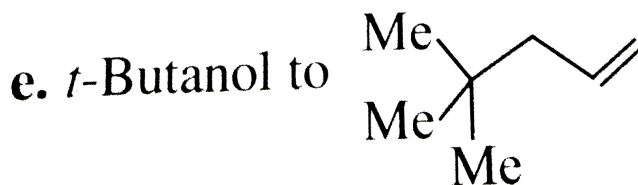
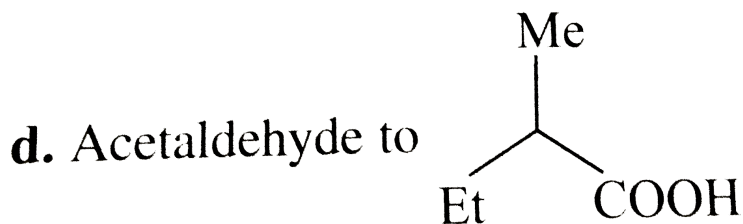
16. The reaction of Me_3CMgCl and $\text{Me}_3\text{C} - \overset{\text{O}}{\parallel} \text{C} - \text{Cme}_3$ after hydrolysis gives a (A) and a 2° alcohol (B) rather than the expected *tri-t-butyl* carbinol. Provide the structures of (A) and (B) with explanation.

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17. Convert of following :



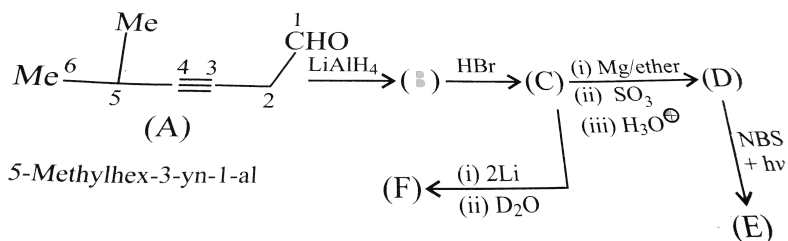
c. Acetic acid to Butan-2-one



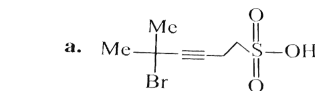
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Exercises (Linked Comprehension)

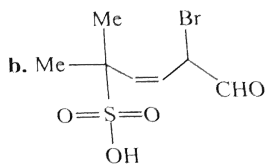
1. In the following reaction sequence, the products (*B*) to (*E*) are formed.



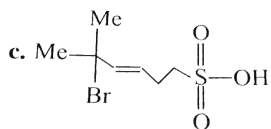
The structure of product (*B*) is :



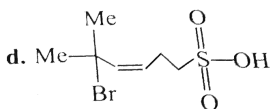
A.



B.



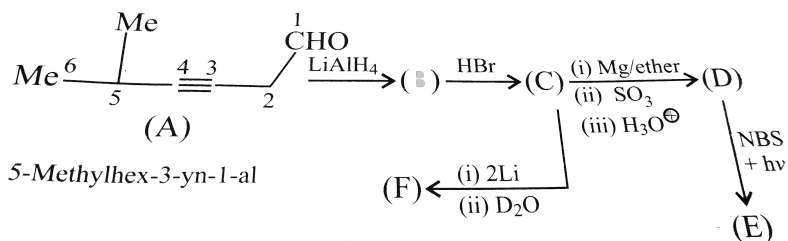
C.



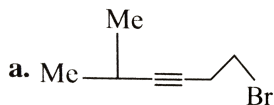
D.

Answer: C

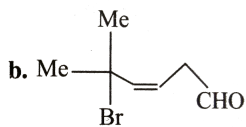
2. In the following reaction sequence, the products (*B*) to (*E*) are formed.



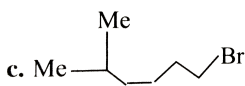
The structure of product (*C*) is :



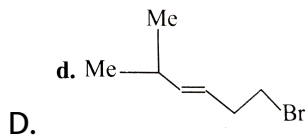
A.



B.



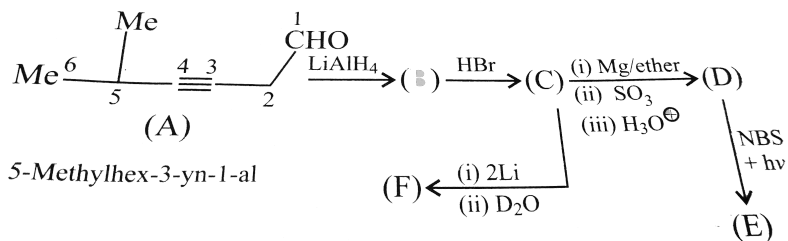
C.



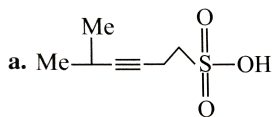
Answer: D

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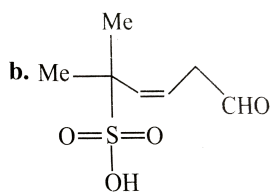
3. In the following reaction sequence, the products (*B*) to (*E*) are formed.



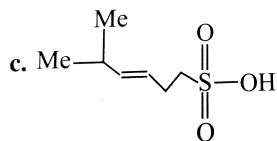
The structure of product (*D*) is :



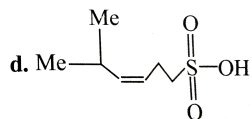
A.



B.



C.

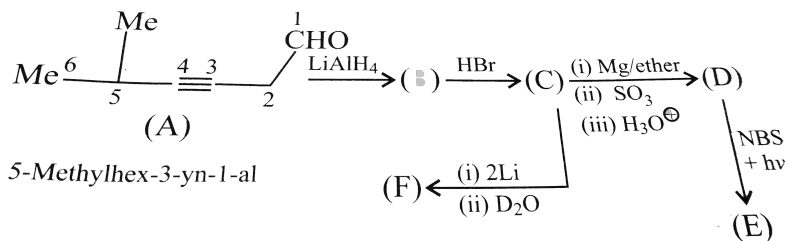


D.

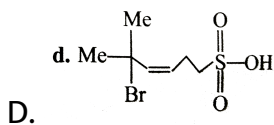
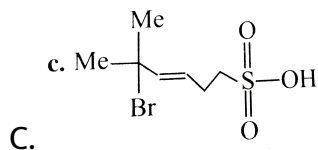
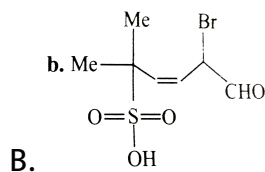
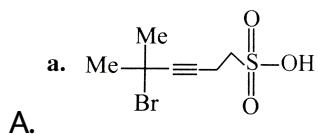
Answer: C

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4. In the following reaction sequence, the products (*B*) to (*E*) are formed.



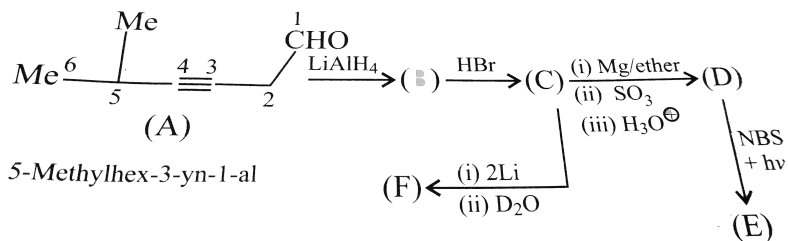
The structure of product (E) is :



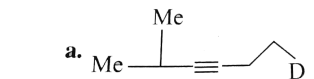
Answer: C

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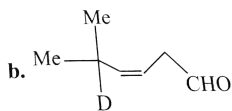
5. In the following reaction sequence, the products (B) to (E) are formed.



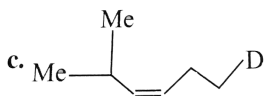
The structure of product (F) is :



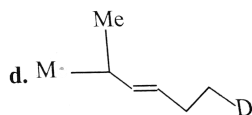
A.



B.



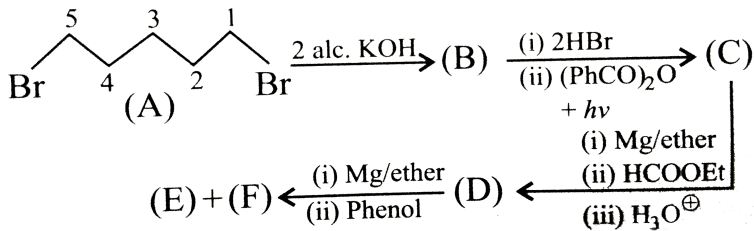
C.



D.

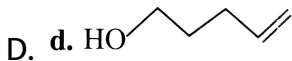
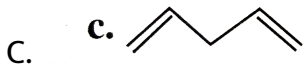
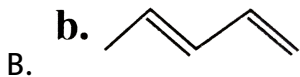
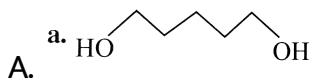
Answer: D





6.

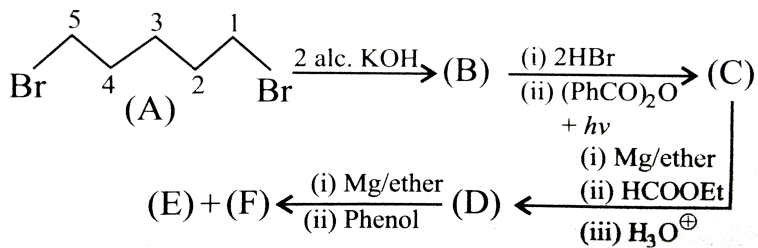
The structure of product (B) is :



Answer: C

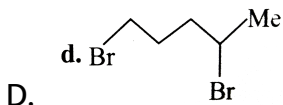
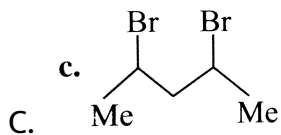
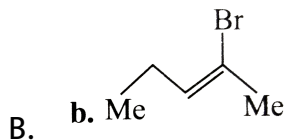
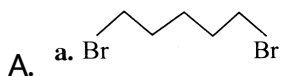


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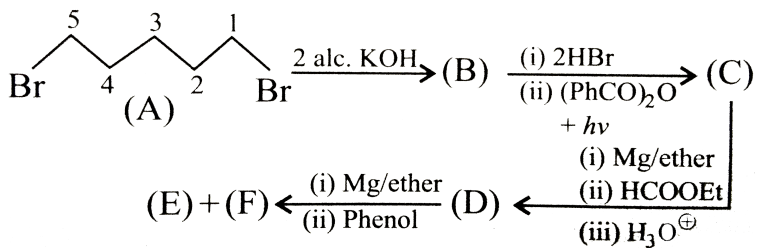
7.

The structure of product (C) is :



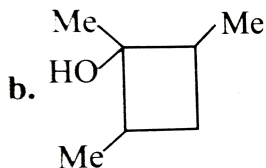
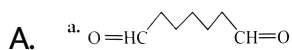
Answer: A

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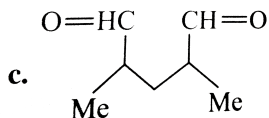


8.

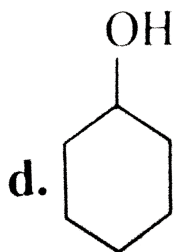
The structure of product (*D*) is :



B.

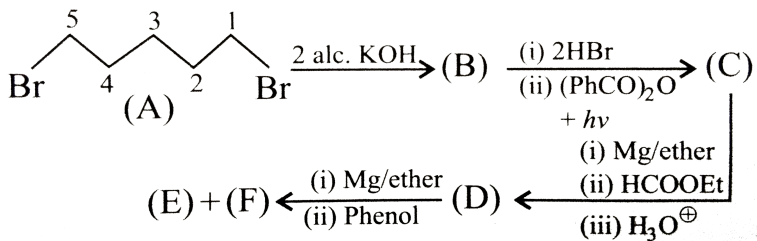


C.



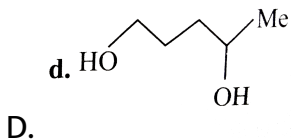
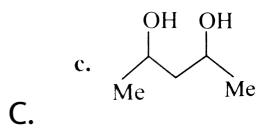
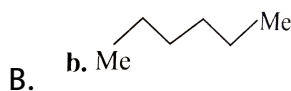
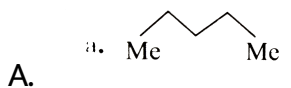
D.

Answer: D

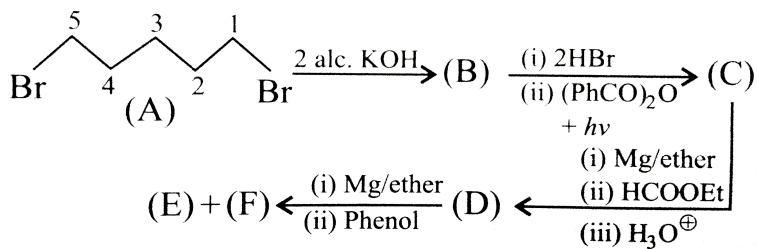


9.

The structure of product (*E*) is :



Answer: A

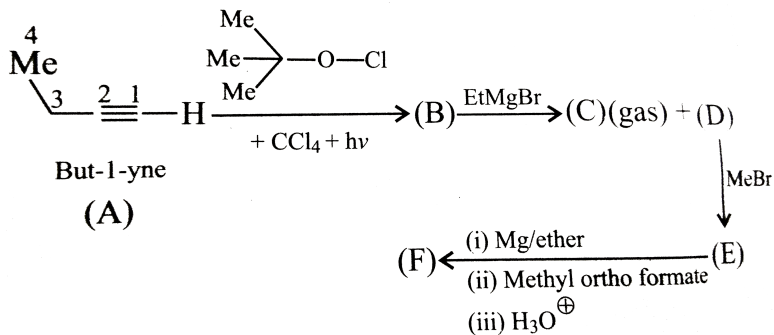


10.

The structure of product (F) is :

- A. a. 1 mol of
- B. b. 2 mol of
- C. c. 1 mol of
- D. d. 2 mol of

Answer: B

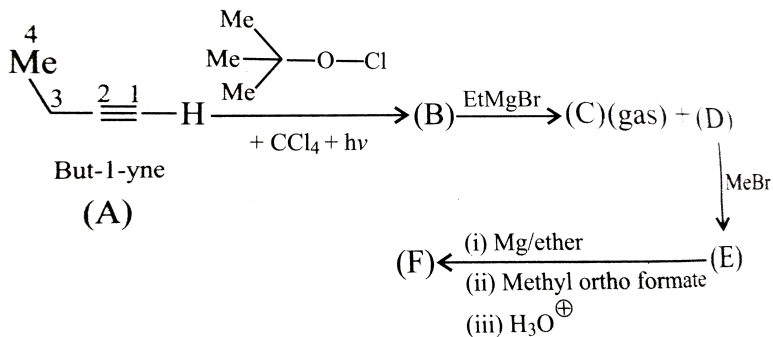


11.

The structure of product (B) is :

- A.
$$\begin{array}{c}
 \text{Me} \\
 | \\
 \text{---} \text{---} \text{---} \text{---} \text{Cl}
 \end{array}$$
- B.
$$\begin{array}{c}
 \text{Me} \\
 | \\
 \text{---} \text{---} \text{---} \text{---} \text{H} \\
 | \\
 \text{Cl}
 \end{array}$$
- C.
$$\begin{array}{c}
 \text{---} \text{---} \text{---} \text{---} \text{---} \text{H} \\
 | \\
 \text{Cl}
 \end{array}$$
- D.
$$\begin{array}{c}
 \text{Me} \\
 | \\
 \text{---} \text{---} \text{---} \text{---} \text{O} \text{---} \begin{array}{l} \text{Me} \\ \text{Me} \\ \text{Me} \end{array}
 \end{array}$$

Answer: B

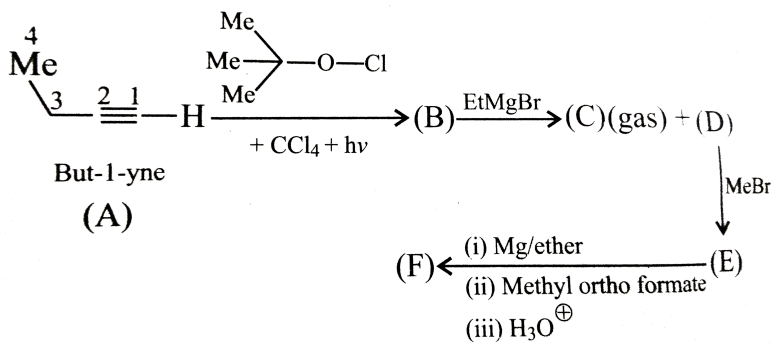


12.

The gas (C) is :

- A. CH_4
- B. C_2H_6
- C. C_2H_4
- D. Isobutene

Answer: B



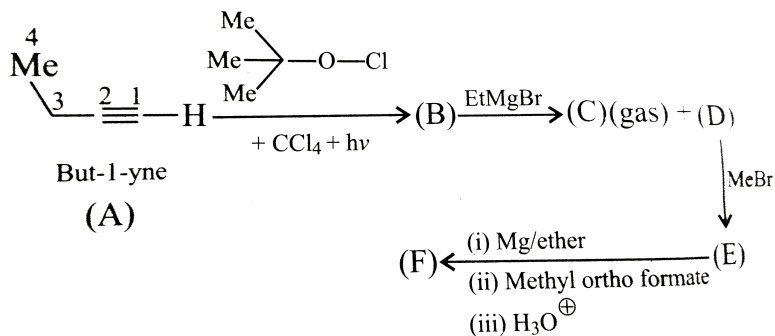
13.

The structure of product (D) is :

- A.
- a. $\text{Me}-\text{CH}_2-\text{C}\equiv\text{C}-\text{MgBr}$
- B.
- b. $\text{Me}-\text{C}(\text{Cl})\equiv\text{C}-\text{MgBr}$
- C.
- c. $\text{Cl}-\text{CH}_2-\text{CH}_2-\text{C}\equiv\text{C}-\text{MgBr}$
- D.
- d. $\text{Me}-\text{C}(\text{MgBr})\equiv\text{C}-\text{O}-\text{C}(\text{Me})_3$

Answer: B

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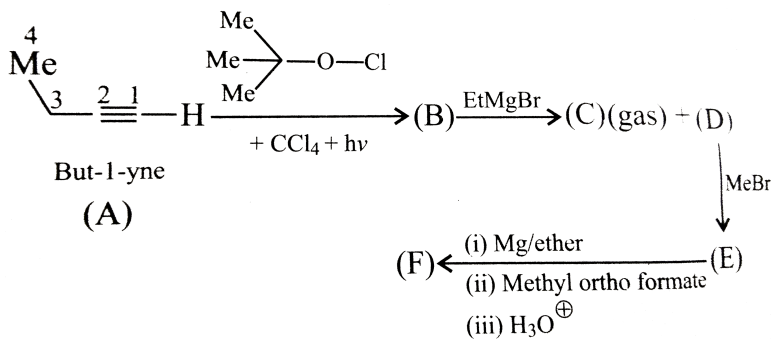
14.

The structure of product (E) is :

- A.
$$\begin{array}{c}
 \text{Me} \\
 | \\
 \text{---} \\
 \equiv \\
 \text{---} \\
 \text{Me}
 \end{array}$$
- B.
$$\begin{array}{c}
 \text{Cl} \\
 | \\
 \text{---} \\
 \text{---} \\
 \equiv \\
 \text{---} \\
 \text{Me}
 \end{array}$$
- C.
$$\begin{array}{c}
 \text{Me} \\
 \diagdown \\
 \text{---} \\
 \text{Cl} \\
 \diagup \\
 \equiv \\
 \text{---} \\
 \text{Me}
 \end{array}$$
- D.
$$\begin{array}{c}
 \text{Me} \\
 \diagdown \\
 \text{---} \\
 \text{Me} \\
 \diagup \\
 \equiv \\
 \text{---} \\
 \text{O} \\
 \text{---} \\
 \begin{array}{c}
 \text{Me} \\
 \diagdown \\
 \text{---} \\
 \text{Me} \\
 \diagup \\
 \text{Me}
 \end{array}
 \end{array}$$

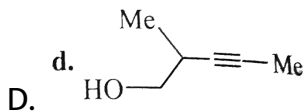
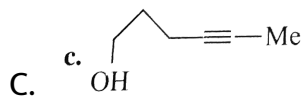
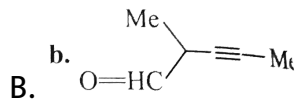
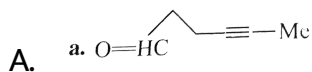
Answer: C

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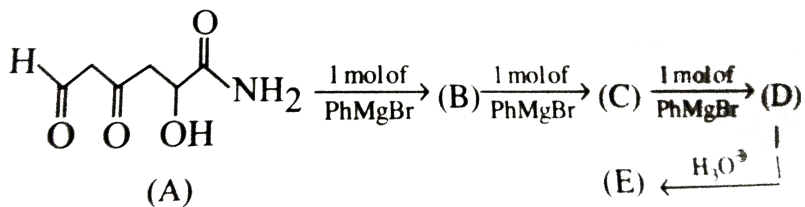
15.

The structure of product (F) is :



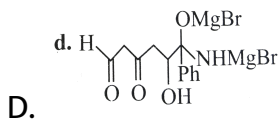
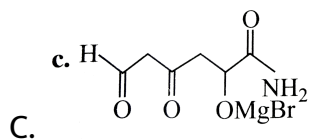
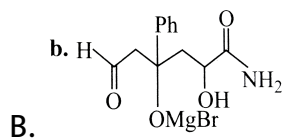
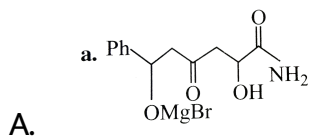
Answer: C

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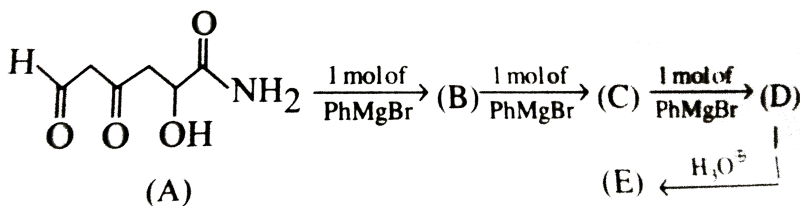
16.

The structure of product (B) is :

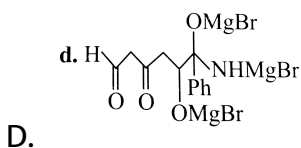
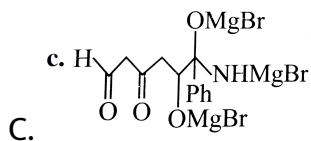
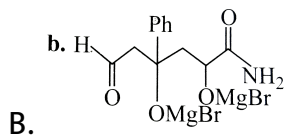
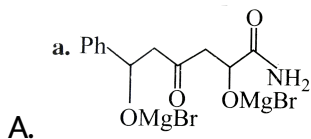


Answer: C

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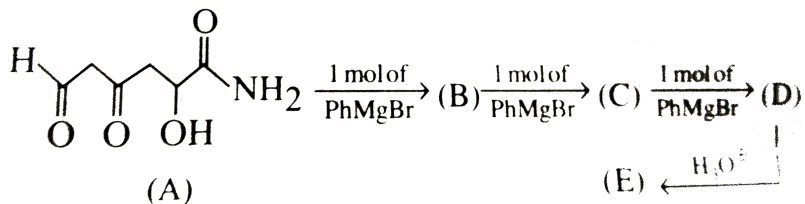


The structure of product (C) is :



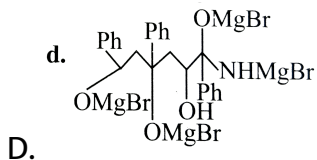
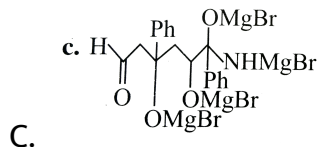
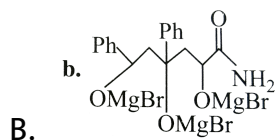
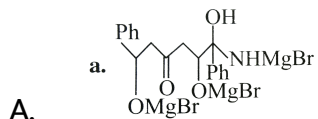
Answer: A

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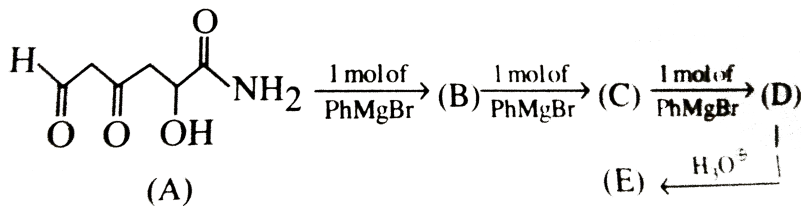
18.

The structure of product (D) is :



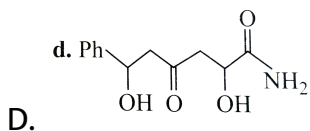
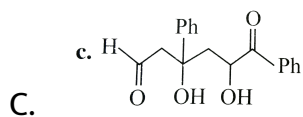
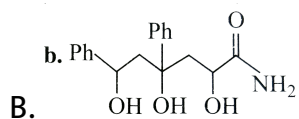
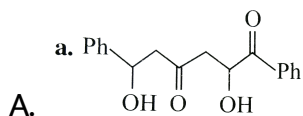
Answer: B

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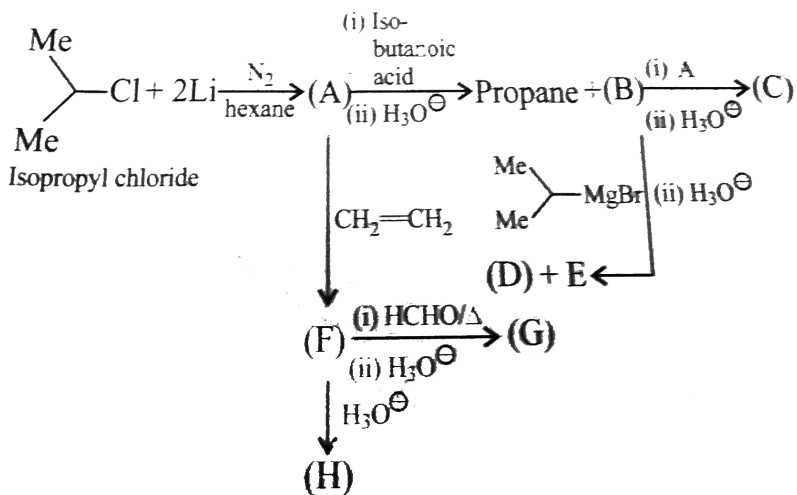
19.

The structure of product (E) is :



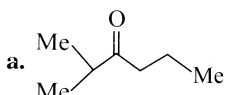
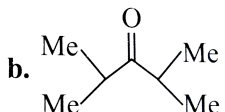
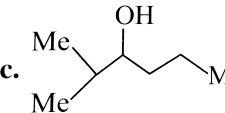
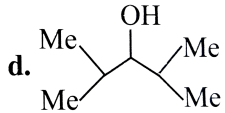
Answer: B

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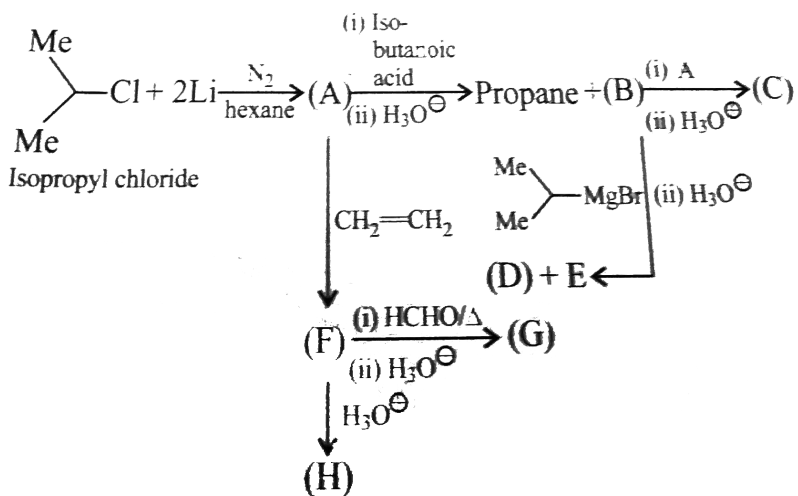


21.

The structure of product (B) is :

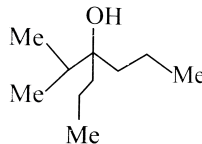
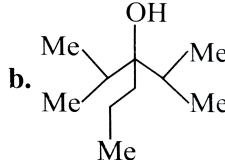
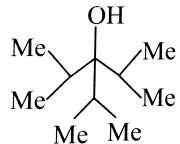
- A. 
- B. 
- C. 
- D. 

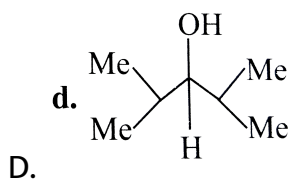
Answer: B



22.

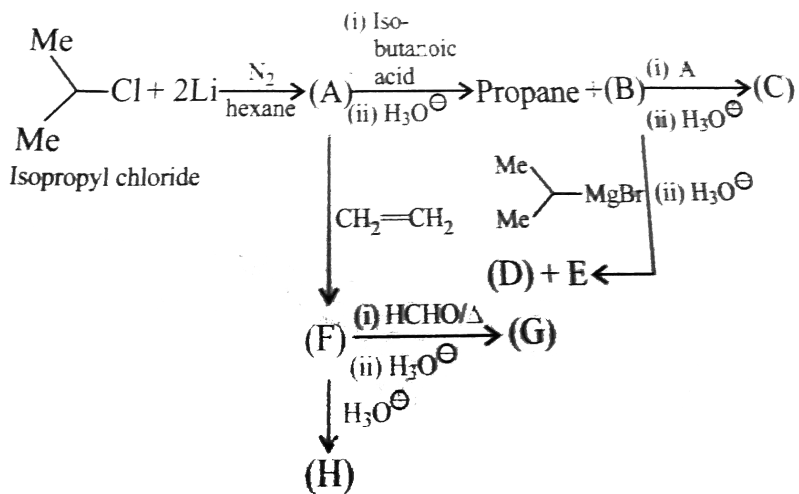
The structure of product (C) is :

- A. 
- B. 
- C. 



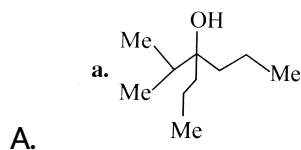
Answer: C

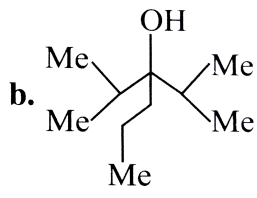
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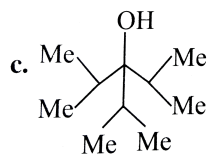
23.

The structure of product (D) is :

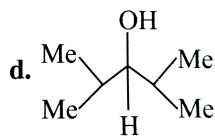




B.



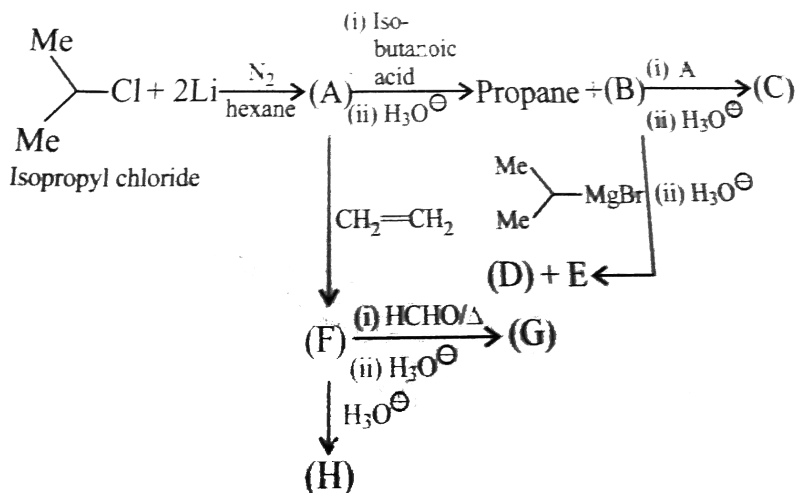
C.



D.

Answer: D

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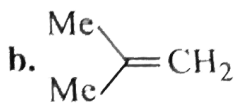


24.

The structure of product (E) is :



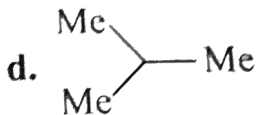
A.



B.

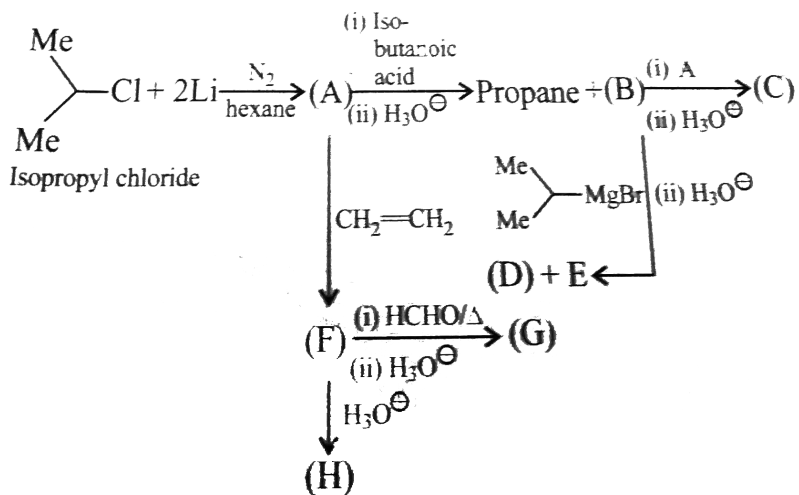


C.



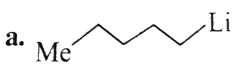
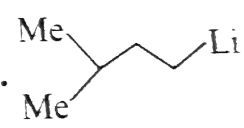
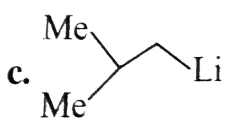
D.

Answer: A



25.

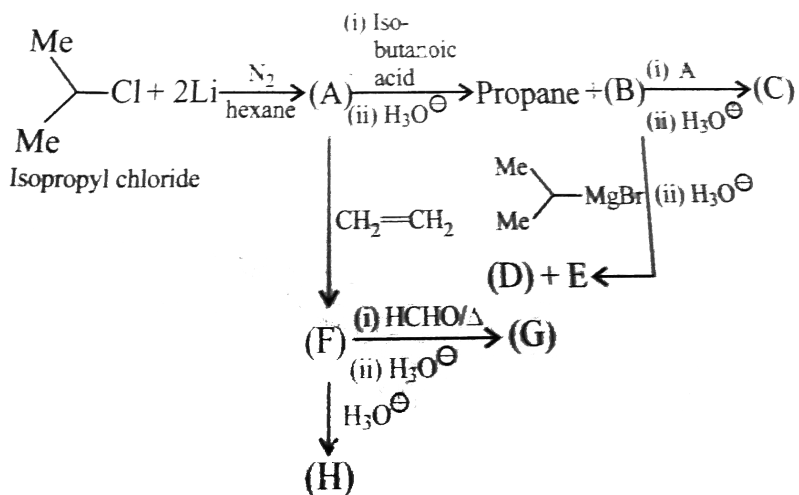
The structure of product (F) is :

- A. a. 
- B. b. 
- C. c. 

D. None of these

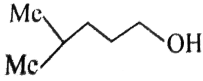
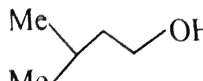
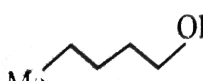
Answer: B

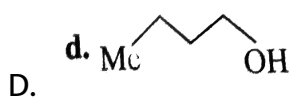
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26.

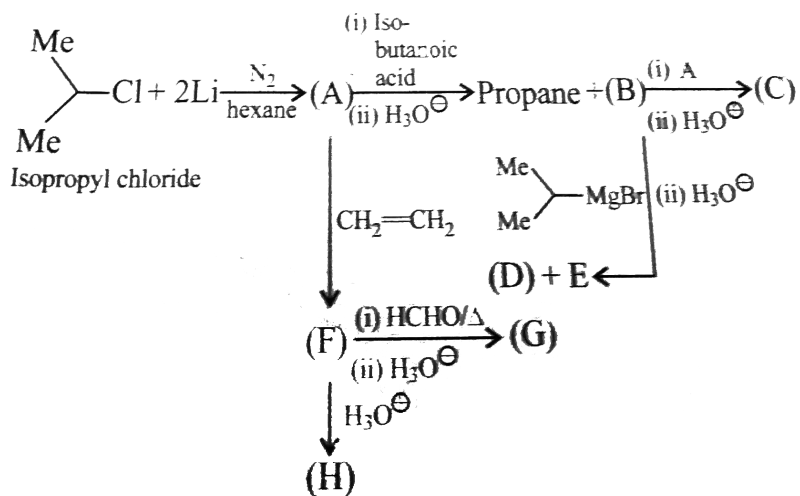
The structure of product (G) is :

- A. a. 
- B. b. 
- C. c. 



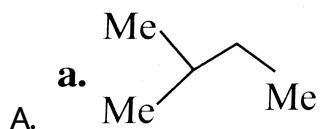
Answer: A

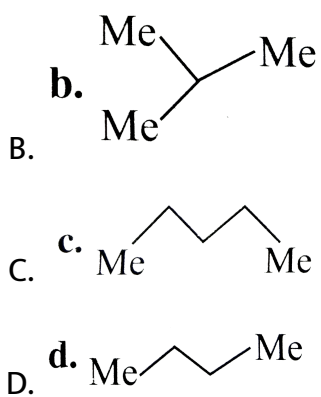
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27.

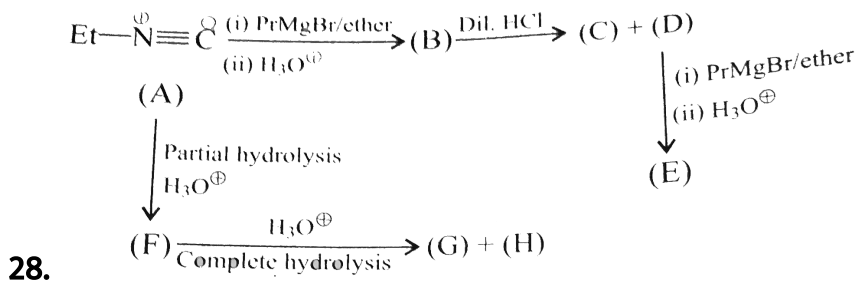
The structure of product (H) is :



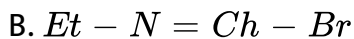
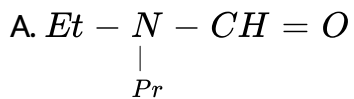


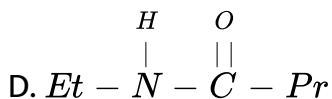
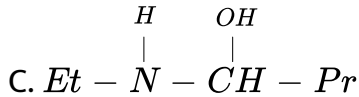
Answer: A

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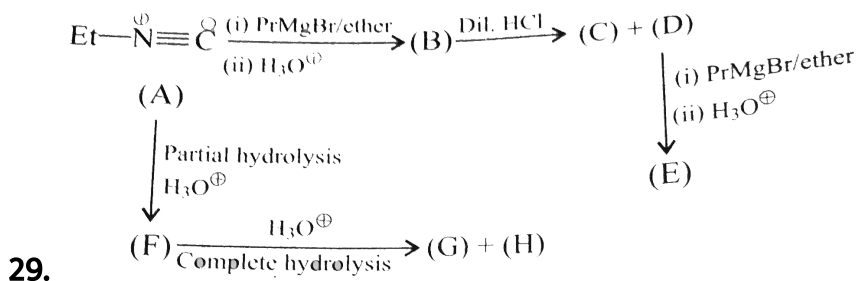
The compound (B) is :





Answer: B

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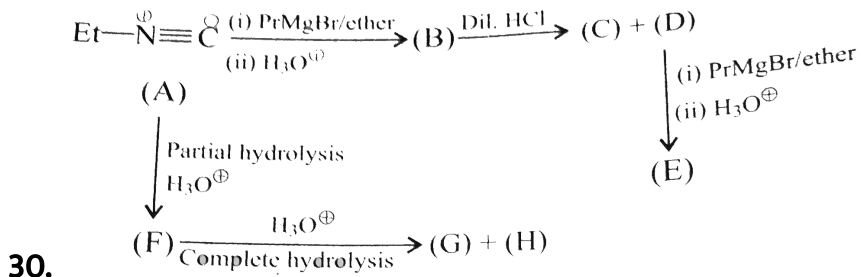
The compounds (C) and (D), respectively, are :



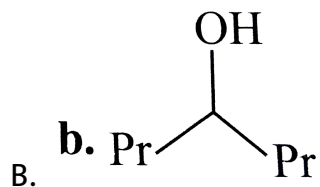
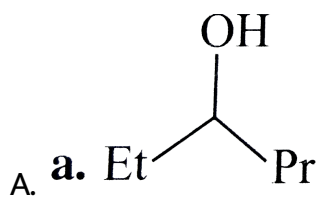
D. $EtNH_2$ and $PrCH_2OH$.

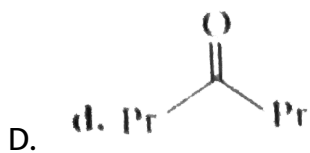
Answer: A

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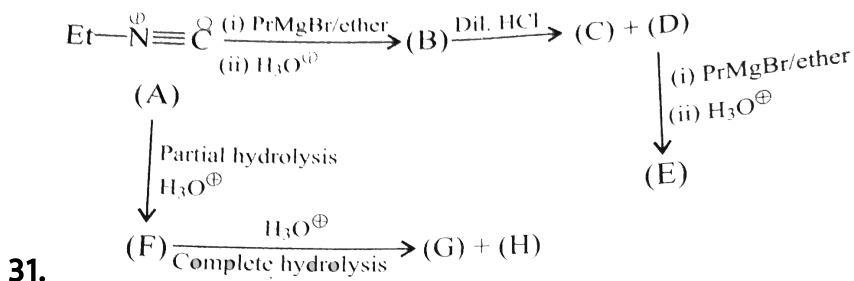
The structure of product (E) is :





Answer: B

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The compound (F) is :

A. *N* - Ethyl methanamide

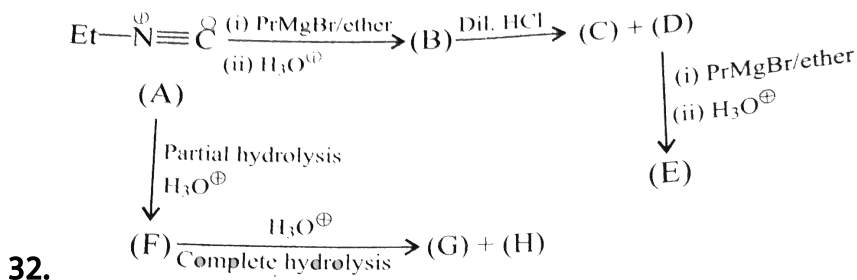
B. N-Propylmethanamide

C. N-Ethylbutanamide

D. N-Propylpropanamide

Answer: A

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The compounds (*G*) and (*H*), respectively, are :

A. Propanamide and $\text{CH}_2 = \text{O}$

B. Ethylamine and $\text{CH}_2 = \text{O}$

C. Ethylamine and HCOOH

D. Propanamide and HCOOH

Answer: C

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33. 

Which of the following statements is//are correct ?

A. When $G. R$ reaction with alkyl isocyanide, of electrophile

(MgX^{\oplus}) first adds of the C atom of $(N^{\oplus} \equiv C^{\ominus})$ group and then the nucleophile (R^{\ominus}) adds of the same C atom.

B. When $G. R$ reacts with alkyl isocyanide, the nucleophile

(R^{\ominus}) first adds to the C atom of $(N^{\oplus} \equiv C^{\ominus})$ group and then the electrophile (MgX^{\oplus}) adds to the same C atom.

C. When $G. R$ reacts with alkyl isocyanide, electrophile (MgX^{\oplus})

adds to the C atom of $(-N^{\oplus} \equiv C^{\ominus})$ group and the

nucleophile (R^{\ominus}) adds to the N atom.

D. when alkyl isocyanide is hydrolysed in dilute acidic medium.

H^{\oplus} (electrophile) adds to the C atom of $\left(-\overset{\oplus}{N} \equiv \overset{\ominus}{C} \right)$

group and then $\overset{\ominus}{O}H$ (nucleophile) adds to the same C atom.

Answer: A::B

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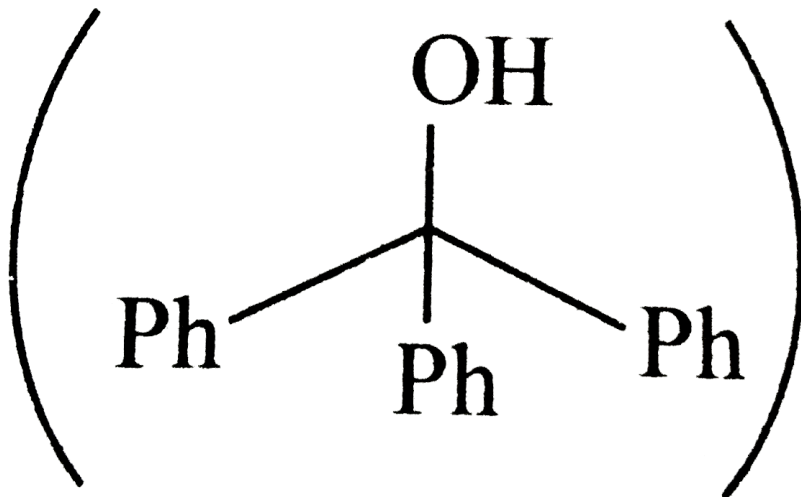
Exercises (Multiple Correct)

1.

A

3°

alcohol



can be

obtained by the reaction of $PhMgBr$ and.

- A. Ethyl carbonate
- B. Benzophenone
- C. Ethyl benzoate
- D. Benzamide

Answer: A::B::C

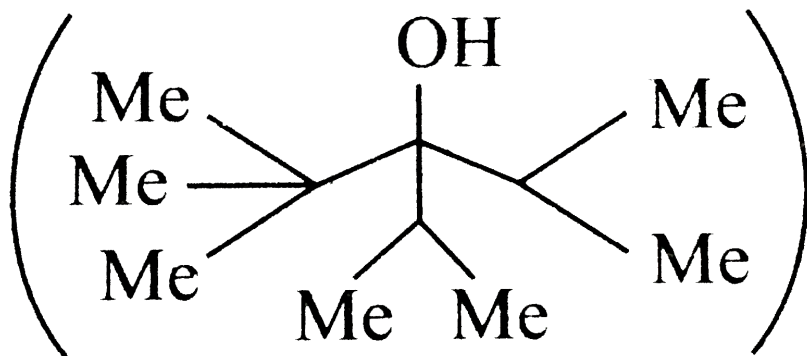
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2.

A

3°

alcohol



can be

obtained by the reaction of ketone (di-isopropyl ketone) and.

- A. Isopropyl magnesium bromide
- B. Isopropyl lithium
- C. Di-isopropyl cadmium
- D. Di-isopropyl zinc

Answer: B

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3. The coupling between C_2H_5MgBr and $MeBr$ gives propane in the presence of :

A. $MeOTs$

B. $EtOTs$

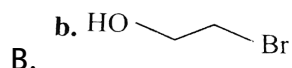
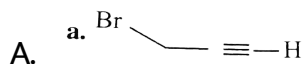
C. $AgBr$

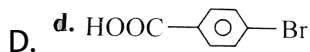
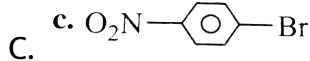
D. $CuCl_2$

Answer: A::B::D

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4. Which of the following halides does not form $G. R$ when treated with magnesium in the presence of ether ?



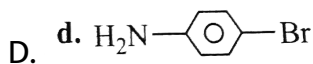
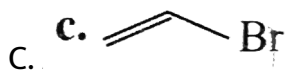
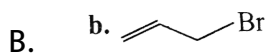


Answer: A::B::C::D

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5. Which of the following halides does form *G. R* when treated with magnesium in the presence of ether ?

A. *PhBr*



Answer: A::B::C

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6. Acetophenone can be obtained by the reaction of $PhMgBr$ and.

- A. Ethane nitrile
- B. Ethanamide
- C. Ethanoyl chloride
- D. Methanamide

Answer: A::B

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7. Hexan-3-one can be obtained by the reaction of $EtMgBr$ and.

- A. Butanamide
- B. Propanamide

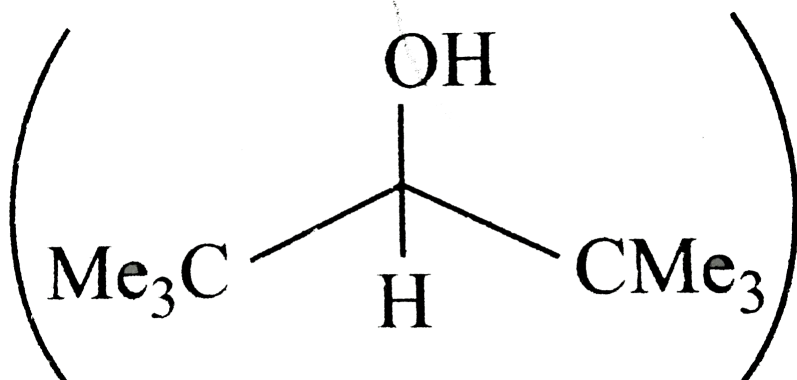
C. Butane nitrile

D. Propane nitrile

Answer: A::C

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8. A 2° alcohol



can be

obtained by the reaction of di-*t*-butyl ketone and

A. Isopropyl magnesium bromide

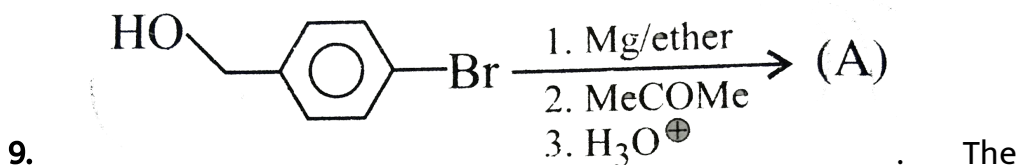
B. *t* - *Butyl* magnesium bromide

C. $EtMgBr$

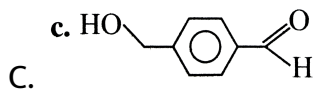
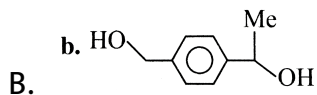
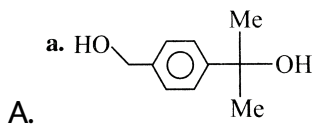
D. $MeMgBr$

Answer: A::B::C

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compound (A) is :

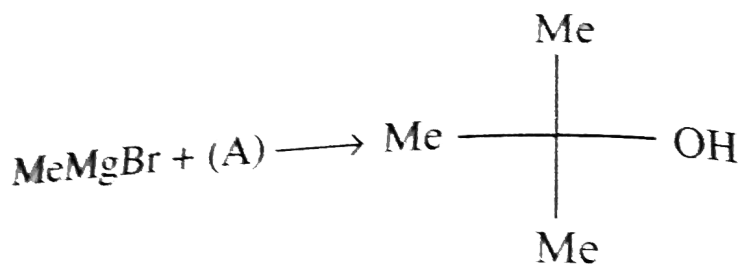


D. None of these

Answer: D

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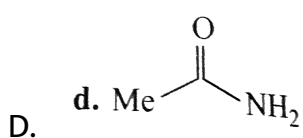
10. Which of the reagents is the most suitable for the following reaction ?



A. $\text{Me} - \text{C} \equiv \text{N}$

B. $\text{Me} \begin{array}{c} \text{O} \\ || \\ \text{---} \\ \text{OMe} \end{array}$

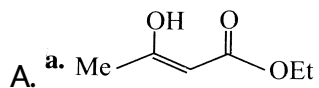
C. $\text{Me} \begin{array}{c} \text{O} \\ || \\ \text{---} \\ \text{OTs} \end{array}$



Answer: C

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11. Which of the following would give benzene when reacted with *PhMgBr* ?



B. H_2

C. Methyl amine

D. NH_3

Answer: A::B::C::D

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12. $\text{EtNH}_2 + \text{MeMgI} \xrightarrow[\text{in the presence of pyridine}]{\text{Heated at high temp.}}$ Gas(A) The volume of gas (A) obtained at S.T.P when 0.45gm of EtNH_2 reacts with MeMgI is.

A. 224ml

B. 22.4ml

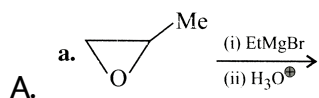
C. 448ml

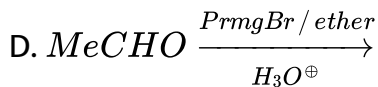
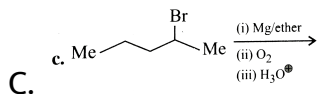
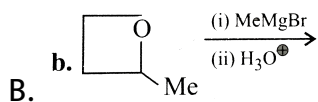
D. 44.8 ml

Answer: C

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13. Which of the following reactions would give *pentan-2-ol*?

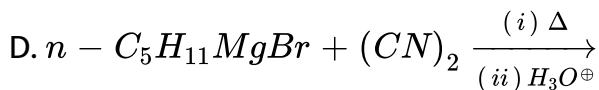
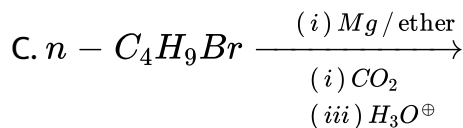
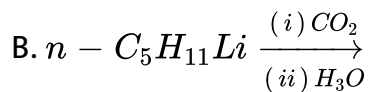
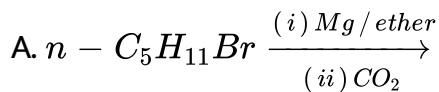




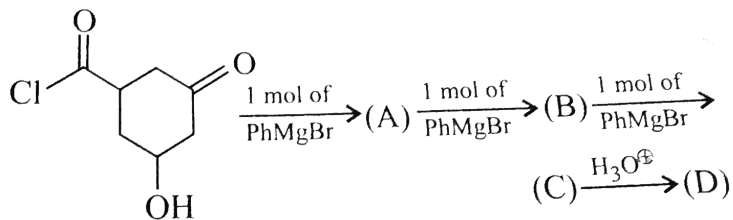
Answer: A::B::C::D

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14. Which of the following reactions would give caproic acid ?



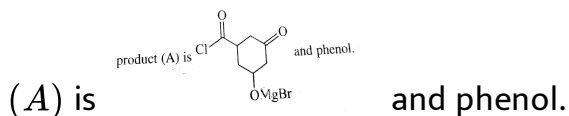
Answer: A::B



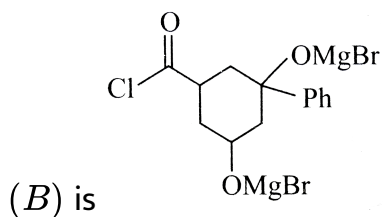
15.

Which of the following statements is//are correct ?

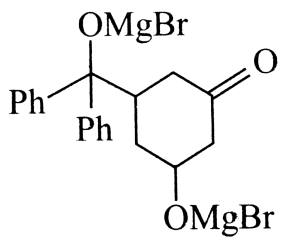
A. First mole of *G. R* reacts at ($-OH$) group and the product



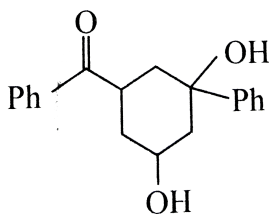
B. Second mole of *G. R* reacts with keto group and the product



C. Second mole of *G. R* reacts with acid chloride group and the



D. Compound (*D*) is



Answer: B

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16. Which of the statements is/are correct ?

A. In Reformatsky reaction, α - bromo ester reacts with aldehyde or ketone in the presence of *Mg* to give

β - hydr \otimes y ester.

B. In Reformatsky reaction, α - bromo ester reacts with aldehyde or ketone in the presence of Zn to give β - hydr \otimes y ester.

C. Citric acid is prepared by the reaction of α - bromoethyl acetate and ethyl oxaloacetate in the presence of Zn followed by hydrolysis.

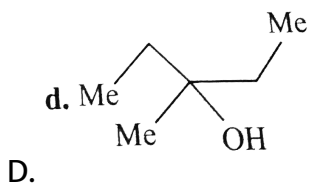
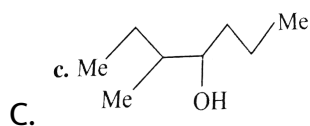
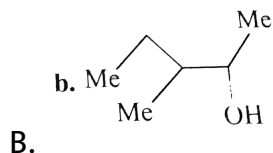
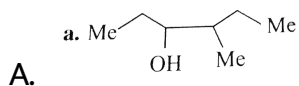
D. Citric acid is prepared by the fermentation of molasses in the presence of *Aspergillus wentienzymes*.

Answer: B::C::D

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Exercises (Single Correct)

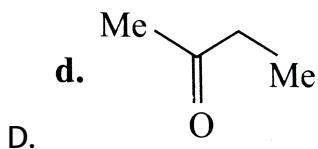
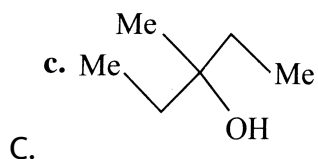
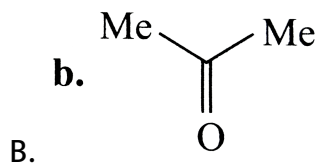
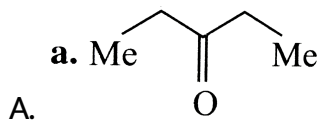
1. 1-Ethyl-2-methyl oxirane when treated with C_2H_5MgBr , followed by hydrolysis gives :



Answer: A


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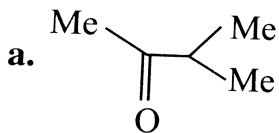
2. When ethane nitrile is treated with C_2H_5MgBr , followed by hydrolysis, the product is :



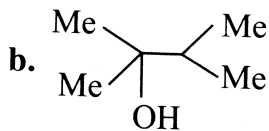
Answer: D

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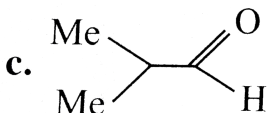
3. When methyl orthoformate is treated with  followed by hydrolysis, the product is :



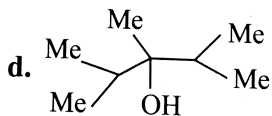
A.



B.



C.

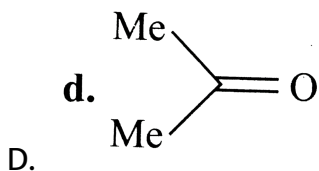
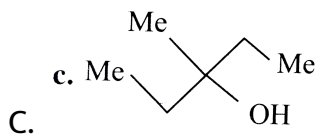
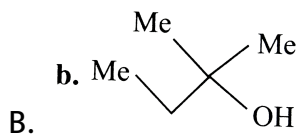
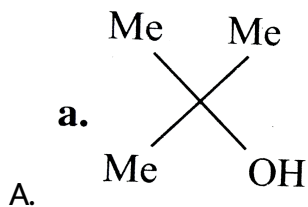


D.

Answer: C

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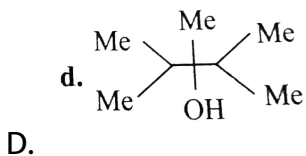
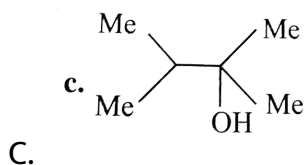
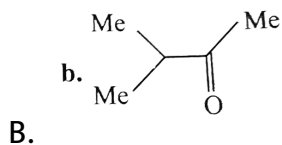
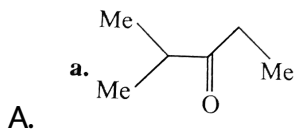
4. When ethyl ethanoate is treated with excess of $MeMgBr$, followed by hydrolysis, the product is :



Answer: A

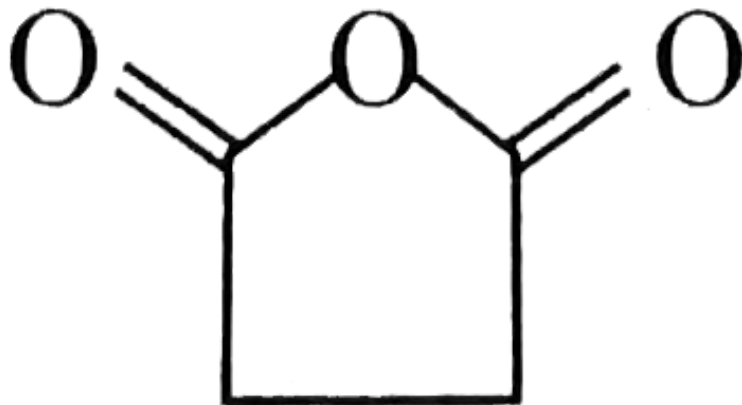
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5. When di-isopropyl cadmium is treated with ethanoyl chloride, the product is :



Answer: B

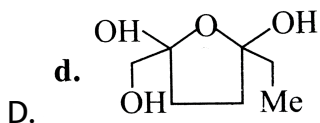
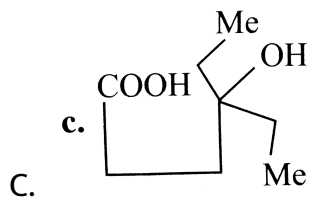
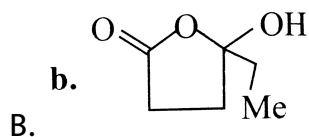
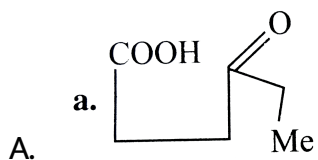
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6. When

is

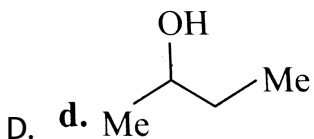
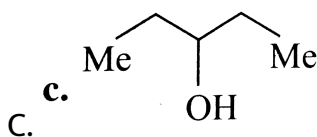
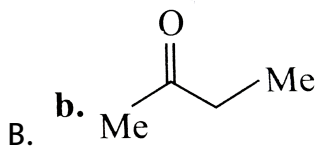
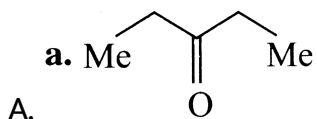
treated with C_2H_5MgBr , followed by hydrolysis, the product is :



Answer: C

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7. When ethanamide is treated with $EtMgBr$, followed by hydrolysis, the product is :



Answer: B

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8. Propane is not formed when C_3H_7MgBr is treated with

A. H_2

B. Phenol

C. Ethanoic acid

D. 2-Butyne

Answer: D



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9. Alcohol is not formed when $RMgX$ is treated with

A. Ethanoyl chloride

B. O_2

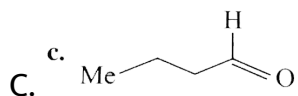
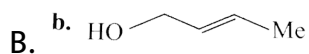
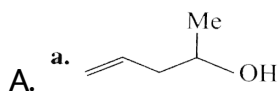
C. Oxirane

D. Methyl orthoformate

Answer: D

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10. $\text{MeMgBr} + \text{CH}_2=\text{CH}-\overset{\text{H}}{\underset{|}{\text{C}}}=\text{O} \xrightarrow{\text{H}_3\text{O}^+}$. The product is :

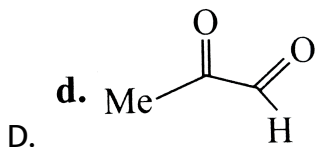
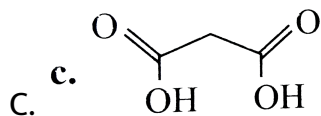
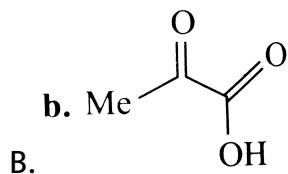
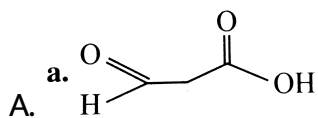
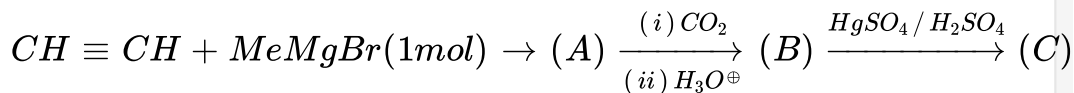


D. None is correct

Answer: C

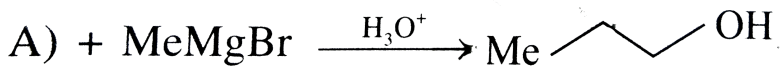
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11. The end product (C) of the following sequence of reaction is :



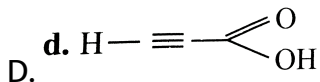
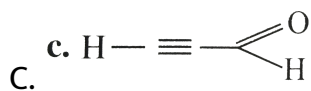
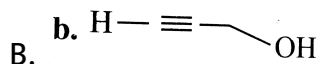
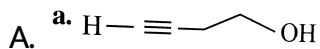
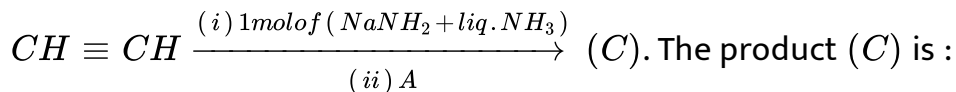
Answer: A

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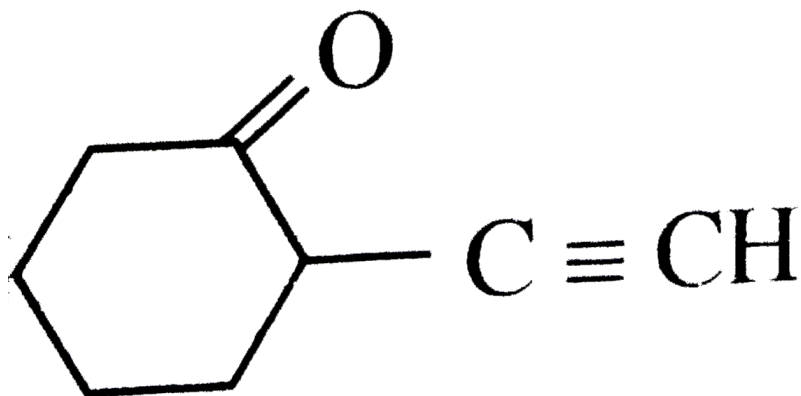
12.

. Hence,

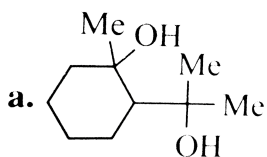


Answer: A

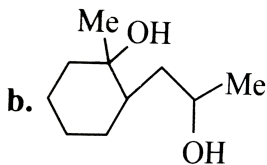
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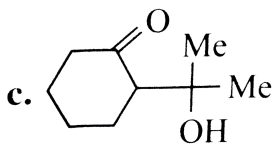
$\xrightarrow{H_2SO_4 / H_2SO_4} (A) \xrightarrow{2 \text{ mol of } MeMgBr / H_3O^+} (B)$. (B) is :



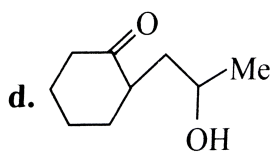
A.



B.



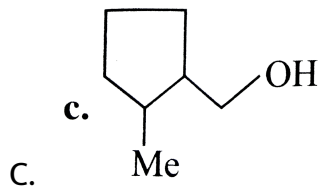
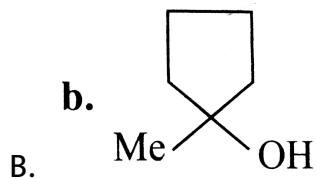
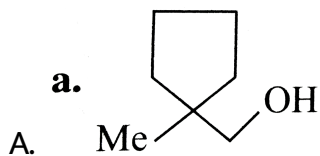
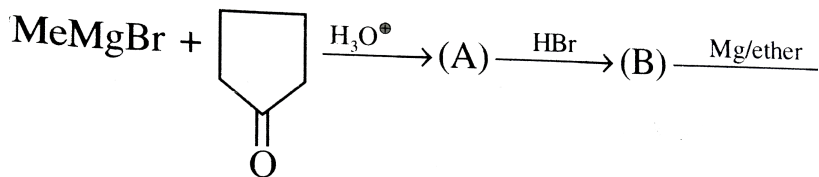
C.



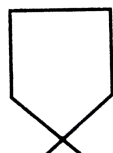
D.

Answer: B

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d.

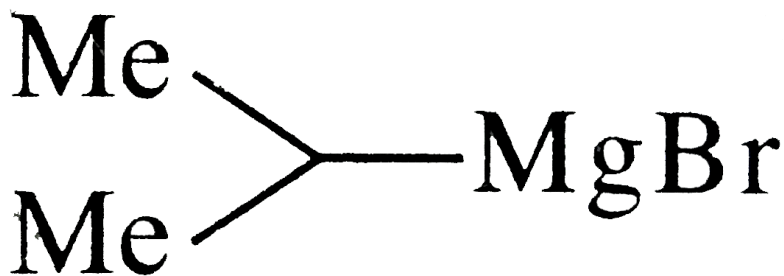


D.



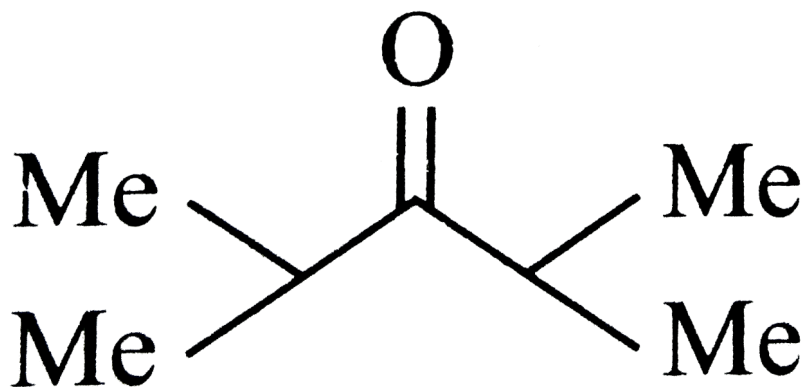
Answer: A

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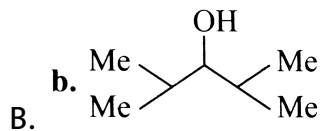
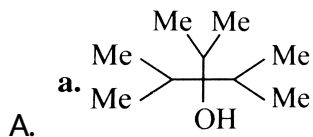
15. When

is



treated with

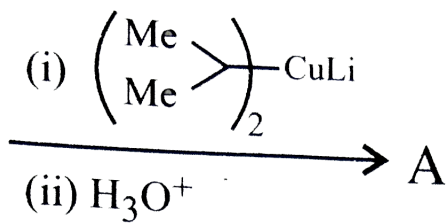
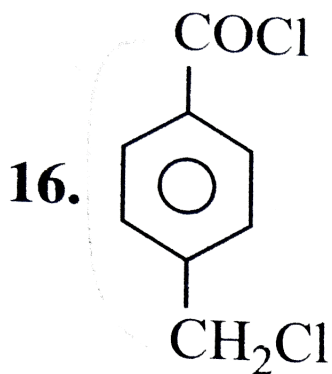
followed by hydrolysis, the product is :



D. None of these

Answer: B

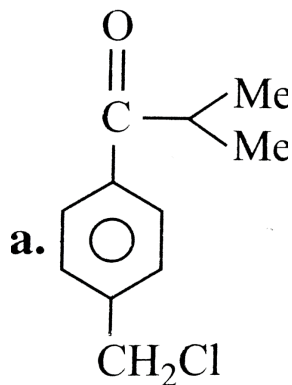
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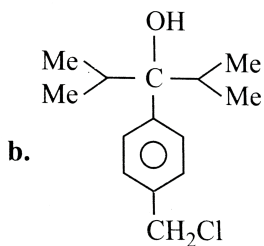
16.

The

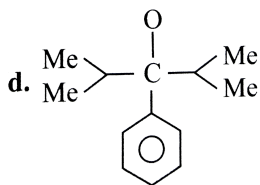
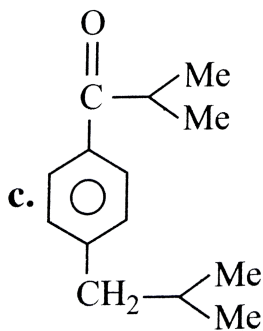
product A is :



A.

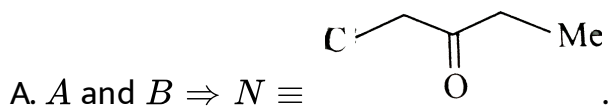
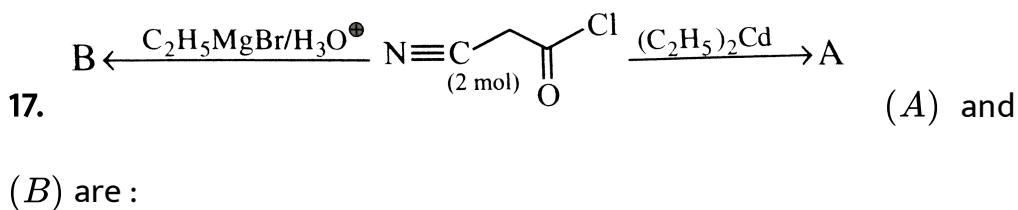


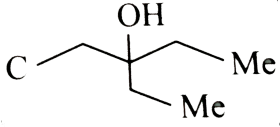
B.



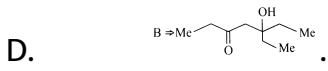
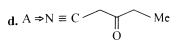
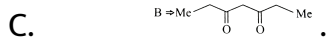
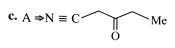
Answer: C

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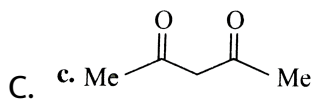
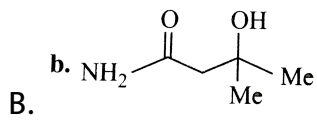
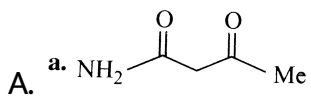
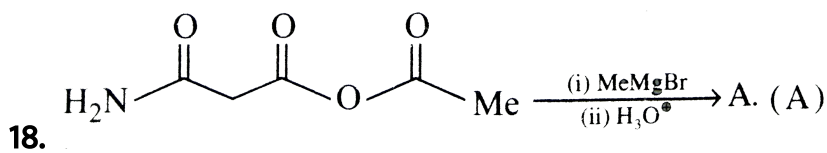


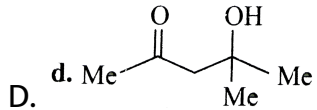
B. A and $B \Rightarrow N \equiv$



Answer: D

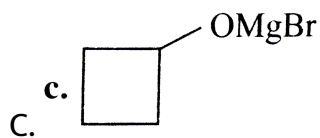
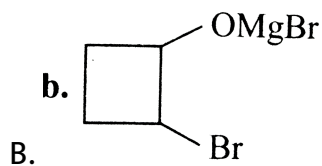
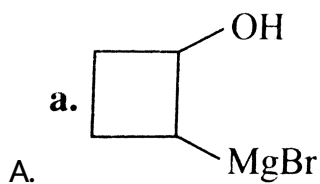
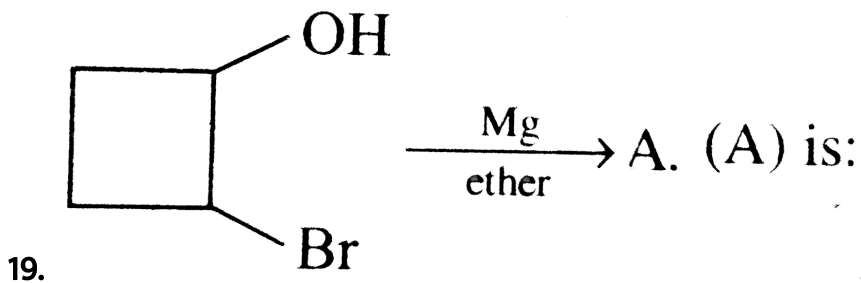
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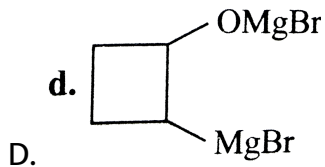




Answer: D

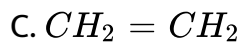
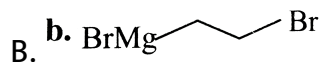
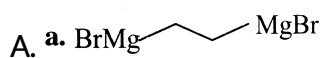
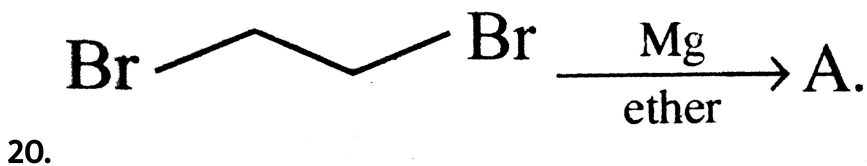
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Answer: C

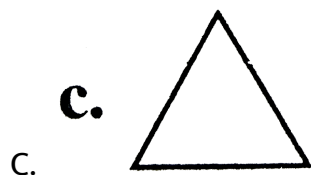
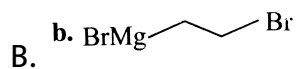
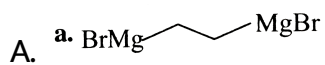
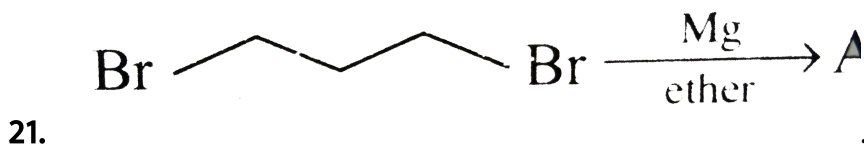
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D. All

Answer: C

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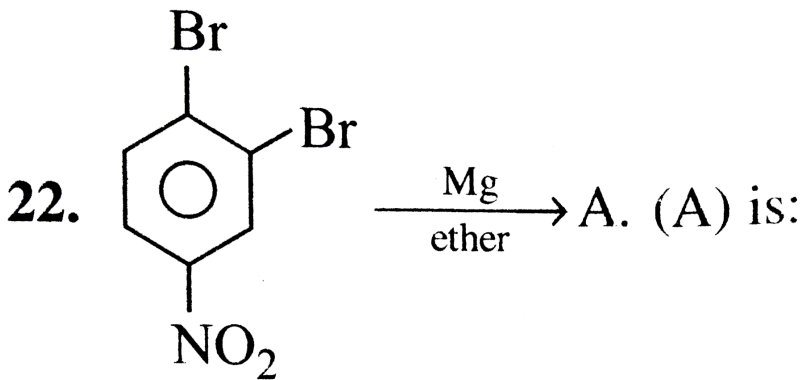


D. All

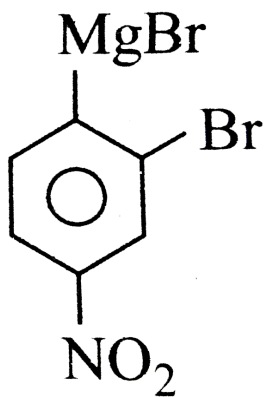
Answer: C



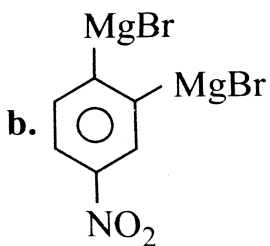
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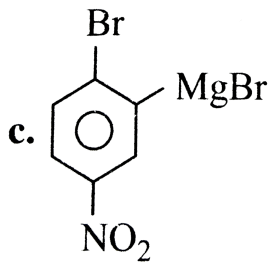
22.



A.



B.

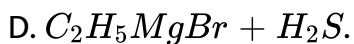
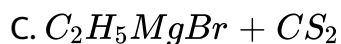
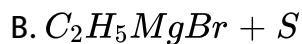
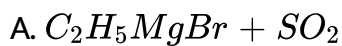


D. None of these

Answer: D

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23. Ethylmercaptan is prepared by the reaction of the following, followed by hydrolysis :



Answer: B

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24. Methyl oxirane on reaction with CH_3MgBr , followed by hydrolysis, gives alcohol. By which of the following mechanisms does the reaction proceed ?

A. SN^1

B. SN^2

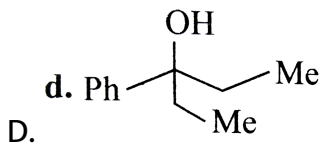
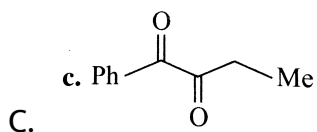
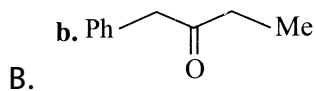
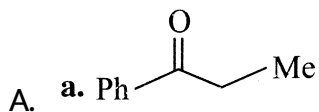
C. SN^i

D. SE

Answer: B

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25. Benzonitrile on reaction with C_2H_5MgBr , followed by hydrolysis, gives.



Answer: A

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26. Acetoisonitrile on reaction with C_2H_5MgBr followed by hydrolysis, gives compound (A), which on further hydrolysis gives

(B) and (C).

(B) and (C) are :

A. $MeNH_2$ and $EtCHO$

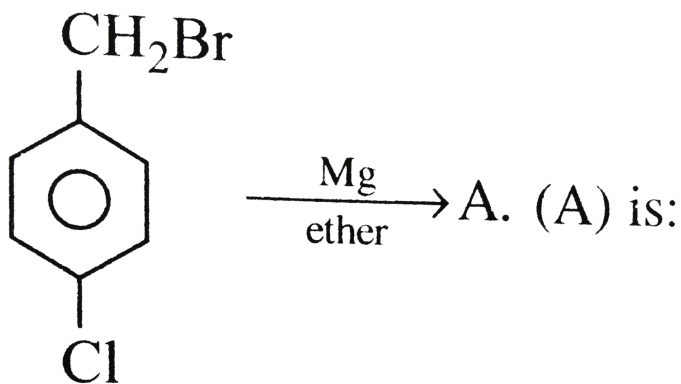
B. $EtNH_2$ and $MeCHO$

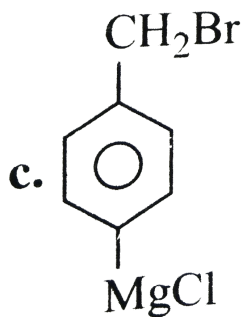
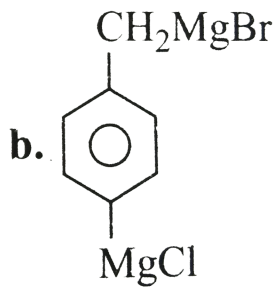
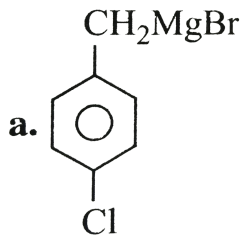
C. $MeNH_2$ and $EtCOOH$

D. $EtNH_2$ and $MeCOOH$

Answer: A

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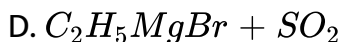
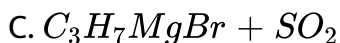
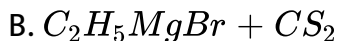
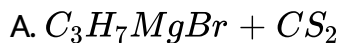


D. None of these

Answer: A

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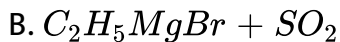
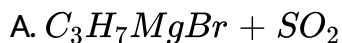
28. Propane dithioic acid is prepared by the reaction of the following, followed by hydrolysis :

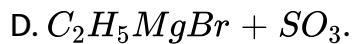
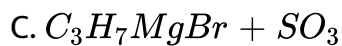


Answer: B

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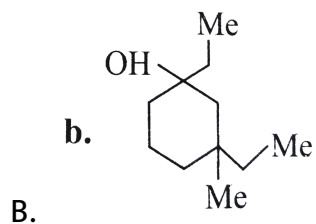
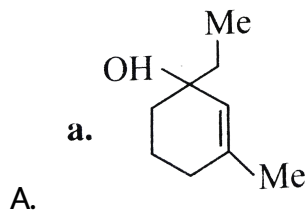
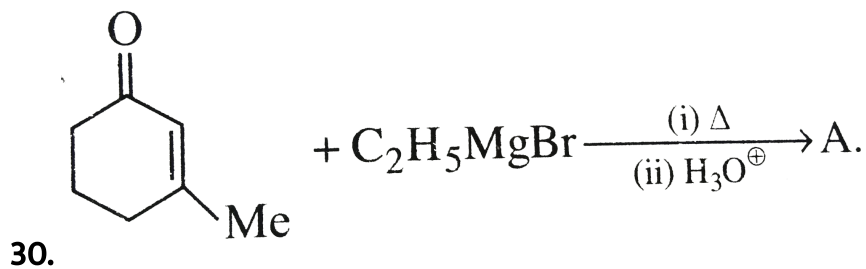
29. Propylsulphinic acid is prepared by the reaction of the following, followed by hydrolysis :

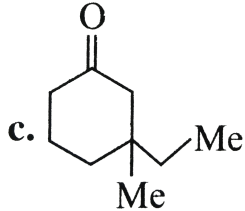




Answer: A

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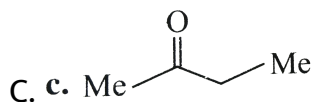
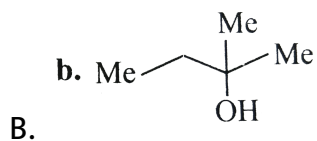
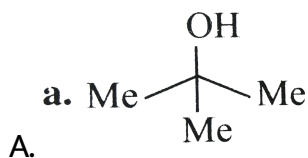
C.

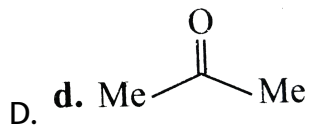
D. 

Answer: C

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31. Ethanoic propanoic anhydride on reaction with excess of $MeMgBr$ gives the major product.

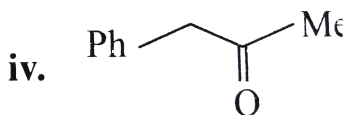
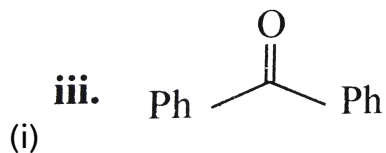
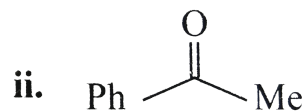
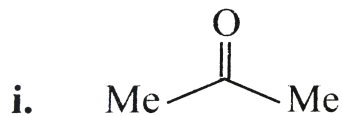




Answer: A

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32. Reactivity of $MeMgBr$ with the following in the decreasing order is :



A. $(i) > (ii) > (iii) > (iv)$

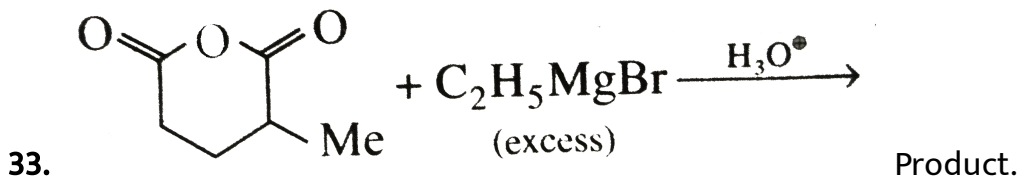
B. $(iv) > (i) > (ii) > (iii)$

C. $(i) > (iii) > (ii) > (iv)$

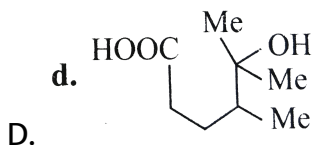
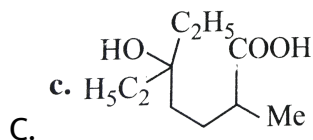
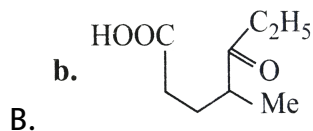
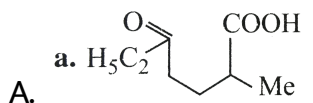
D. $(iv) > (ii) > (iii) > (i)$

Answer: B

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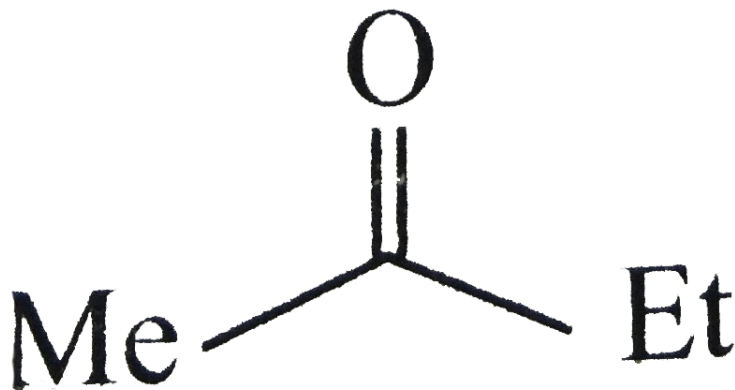


The major product is :



Answer: C

34. Reactivity of



with the

following *G. R* in the decreasing order is :

(i) $MeMgBr$

(ii) $EtMgBr$

(iii) $Me_2CH - MgBr$

(iv) $Me_3C - MgBr$.

A. $(i) > (ii) > (iii) > (iv)$

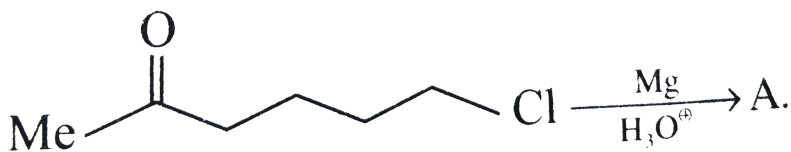
B. $(iv) > (iii) > (ii) > (i)$

C. (i) > (ii) > (iv) > (iii)

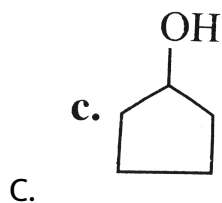
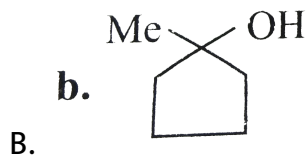
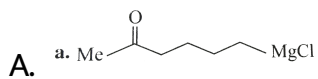
D. (iv) > (ii) > (iii) > (i)

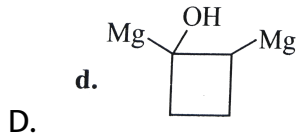
Answer: A

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35.





Answer: B

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36. Reactivity of $EtMgBr$ with the following in the decreasing order

is :

(i) $HCHO$

(ii) $MeCHO$

(iii) $MeCOMe$

(iv) $Cl_3C - CHO$.

A. (i) > (ii) > (iii) > (iv)

B. (iv) > (iii) > (ii) > (i)

C. (iv) > (i) > (ii) > (iii)

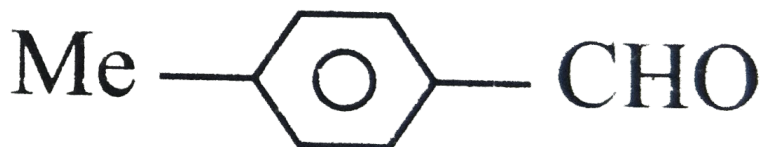
D. $(iii) > (ii)(i) > (iv)$

Answer: C

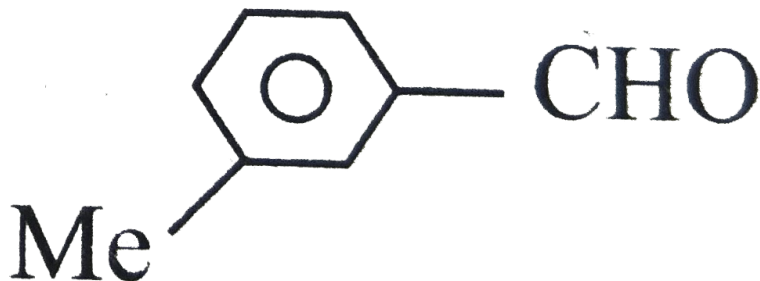
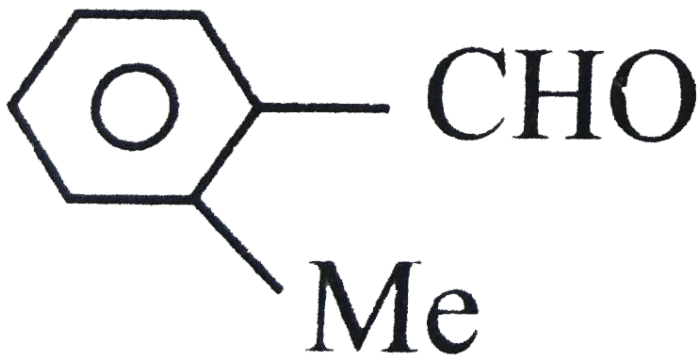
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37. Reactivity of $PhMgBr$ with the following in the decreasing order is :

(i) $PhCHO$



(ii)



A. $(i) > (iv) > (ii) > (iii)$

B. $(iii) > (ii) > (iv) > (i)$

C. $(i) > (iii) > (ii) > (iv)$

D. $(i) > (ii) > (iii) > (iv)$

Answer: A

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38. Reactivity of $PrMgBr$ with the following in the decreasing

order is :

(i) Alcohol

(ii) Aldehyde

(iii) Ketone

(iv) Ester.

A. $(iv) > (iii) > (ii) > (i)$

B. $(i) > (ii) > (iii) > (iv)$

C. $(ii) > (iii) > (i) > (iv)$

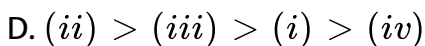
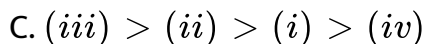
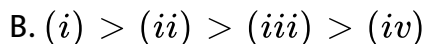
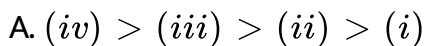
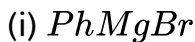
D. $(iv) > (i) > (iii) > (ii)$

Answer: B



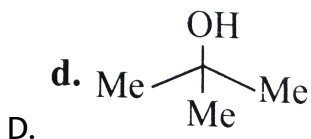
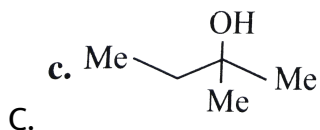
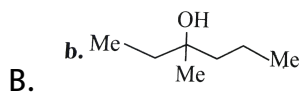
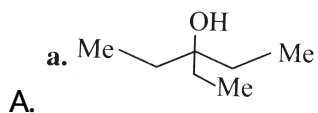
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39. Reactivity of $HCHO$ with the following $G. R$ in the decreasing order is :



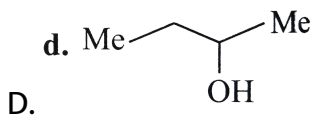
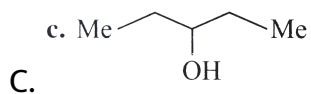
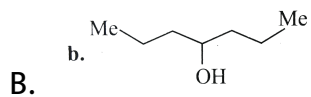
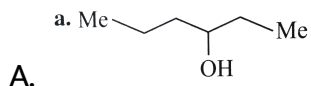
Answer: D

40. Which of the following 3° alcohols does propyl ester give during reaction with $EtMgBr$?



Answer: A

41. Ethyl ester reacts with $PrMgBr$ to give 2° alcohol. The alcohol is :

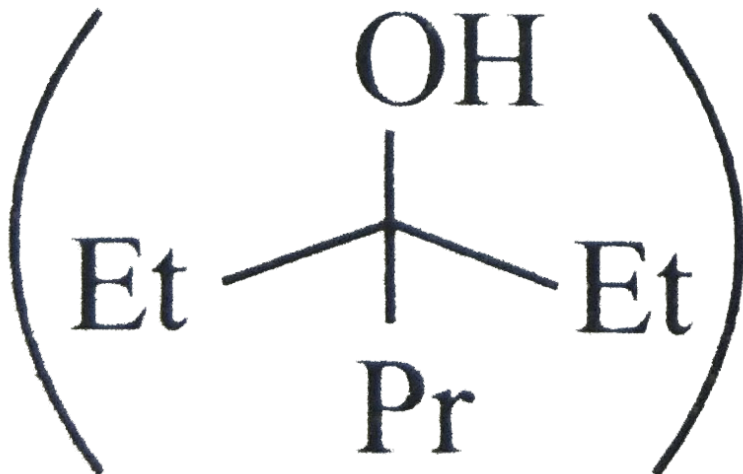


Answer: B



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42. Methyl ester reacts with EtMgBr to give 3° alcohol



The ester is :

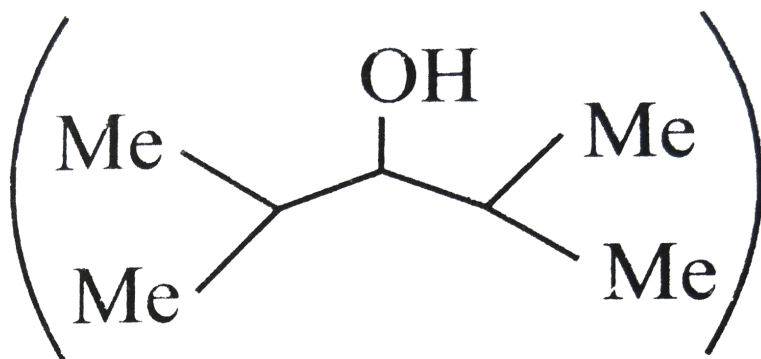
- A. Methyl propanoate
- B. Methyl butanoate
- C. Methyl ethanoate
- D. Methyl formate

Answer: B



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43. Propyl ester reacts with isopropyl magnesium bromide to give



2° alcohol

The ester is :

- A. Propyl methanoate
- B. Isopropyl formate
- C. Propyl ethanoate
- D. Isopropyl ethanoate

Answer: A

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44. Propyl lithium reacts with ethene to give a compound (*A*), which on reaction with methanal followed by acidic hydrolysis gives compound (*B*). The compound (*B*) is :

A. *Heptan* – 1 – *ol*

B. *Heptan* – 2 – *ol*

C. *Hexan* – 1 – *ol*

D. *Hexan* – 2 – *ol*

Answer: C



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45. Coupling reaction between $RMgX$ and $R'X$ takes place to give $R - R'$ in the presence of which of the following reagents ?

A. $R' - OTs$

B. $CoCl_2$

C. $MnCl_2$

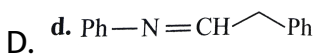
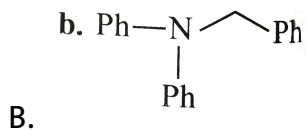
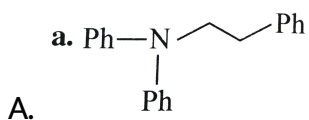
D. All

Answer: D

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46. Phenyl isocyanide + Benzyl magnesium bromide $\xrightarrow[2. H_3O^+]{1. Ether \Delta}$ (A).

The compound (A) is :

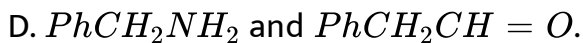
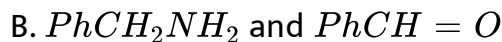


Answer: D

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47. The compound (A) in the previous question is further hydrolysed in dilute acidic medium to give compounds (B) and (C).

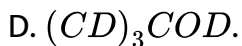
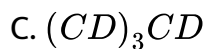
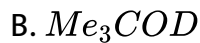
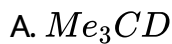
The compounds (B) and (C) are :



Answer: C

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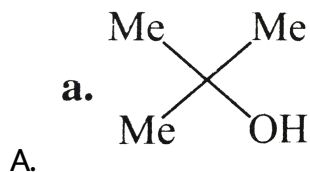
1. $Me_3C - MgCl$ on reaction with D_2O produces :

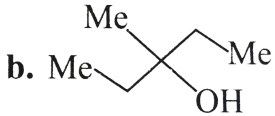


Answer: A

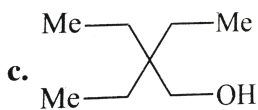
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2. Ethyl ester $\xrightarrow[\text{excess}]{MeMgBr}$ P . The product P will be :

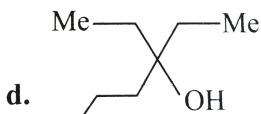




B.



C.

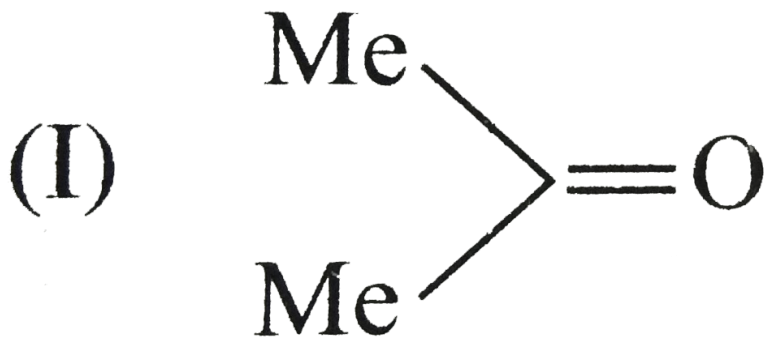


D.

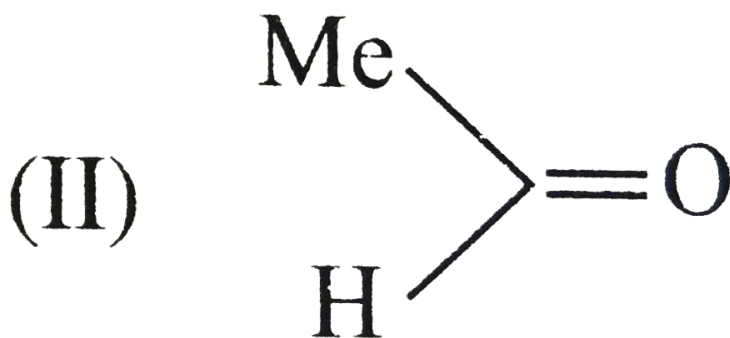
Answer: A

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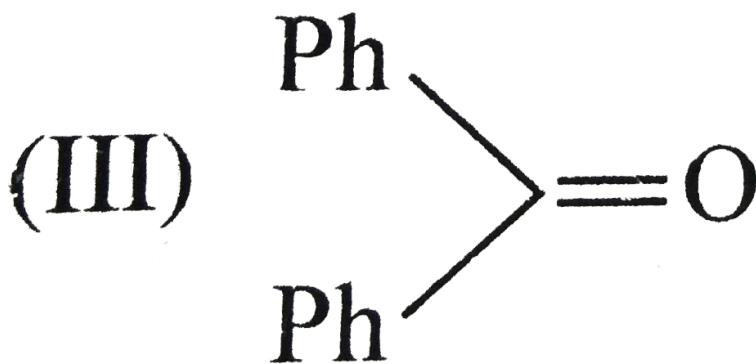
3. The order of reactivity of phenyl magnesium bromide with the following compounds is :



(I)



(II)



(III)

A. $II > III > I$

B. $I > III > II$

C. $II > I > III$

D. All react with the same rate

Answer: C

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4. When phenyl magnesium bromide reacts with *t*-butanol the product would be :

A. Benzene

B. Phenol

C. *t*-Butyl benzene

D. *t*-Butyl phenyl ether

Answer: A

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Exercises Archives (True/False)

1. The reaction of methyl magnesium iodide with acetone followed by hydrolysis gives secondary butanol.

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Exercises Archives (Subjective)

1. Write the structural formula of the main organic product formed when ethyl acetate is treated with double the molar quantity of $MeMgBr$ and the reaction mixture is poured into H_2O .

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2. Compound X (molecular formula C_5H_8O) does not react appreciably with Lucas reagent at room temperature but gives a precipitate with ammoniacal silver nitrate with excess of $MeMgBr$, 0.42gm of X gives 224ml of CH_4 at $S.T.P$ Treatment of X with H_2 in the presence of Pt catalyst followed by boiling with excess of HI , gives n-pentane. Suggest the structure for X and write the equations involved.

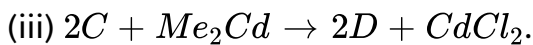
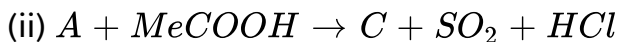
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3. Identify the major products in the following reaction.



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4. In the following reactions, identify the compounds A , B , C and D .



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5. 1,4-Pentadiene reacts with excess of HCl in the presence of benzoyl peroxide to give compound X , which upon reaction with excess of Mg in dry ether forms Y . Compound Y on treatment with ethyl acetate followed by treatment with dilute acid yields Z . Identify the structure of compounds. X , Y and Z .

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6. A hydrocarbon A of the molecular formula C_8H_{10} . On ozonolysis gives only the compound $B(C_4H_6O_2)$. The compound B can also be obtained from the alkyl bromide $C(C_3H_5Br)$ upon treatment with Mg in dry ether followed by the addition of CO_2 and acidification. Identify A , B and C and also give equations for the reactions.

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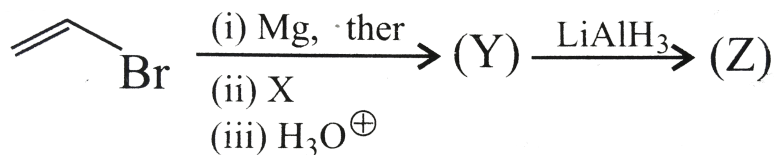
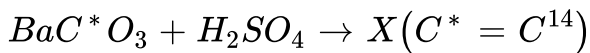
7. An ester $A(C_4H_8O_2)$, on treatment with excess of methyl magnesium bromide followed by acidification, gives an alcohol B as the sole organic product. Alcohol B on oxidation with $NaOCl$ followed by acidification gives acetic acid. Deduce the structures of A and B . Show the reactions involved.

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8. Cyclobutyl bromide on treatment with magnesium in dry ether forms an organometallic compound (A). The organometallic compound (A) reacts with ethanol to give an alcohol (B) after mild acidification. Prolonged treatment of alcohol (B) with an equivalent amount of HBr gives 1-bromo-1-methylcyclopentane (C) Write the structures of (A) and (B), and explain how (C) is obtained from (B).

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9. Identify $Z + Y$ in the following synthetic scheme and write their structures. Explain the formation of labelled formaldehyde (H_2C^*O) as one of the products when compound (Z) is treated with HBr and subsequently ozonolysed. Take C^* as carbon in the entire scheme.

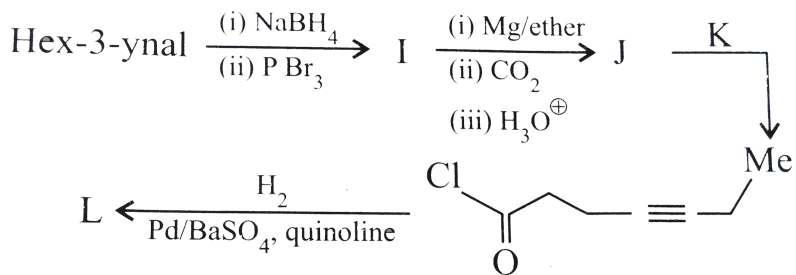


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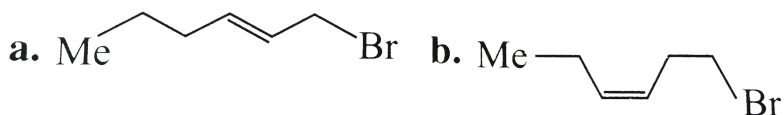
Exercises Archives (Linked Comprehension)

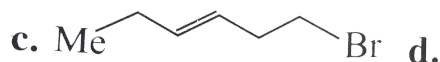
1. In the following reaction sequence, products I, J, and L are formed.

K represents a reagent.

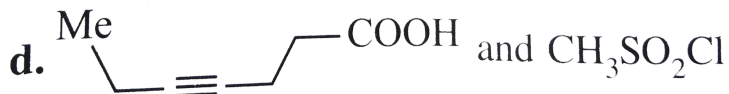
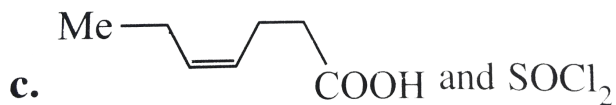
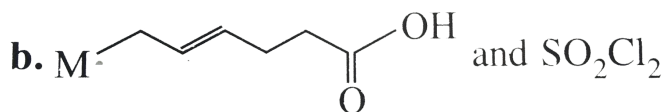
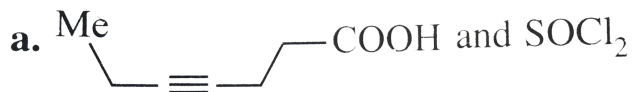


The structures of product *I* is :

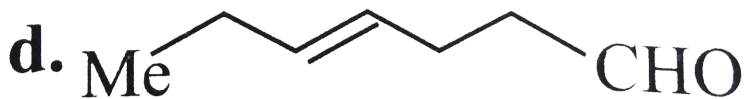
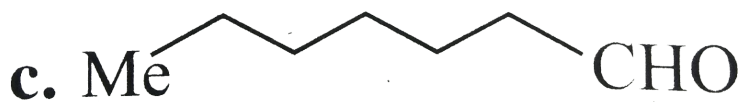
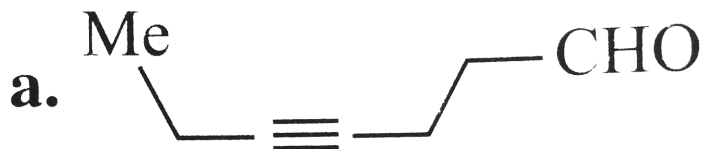




The structures of compounds *J* and *K*, respectively, are :



The structure of product *L* is :



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