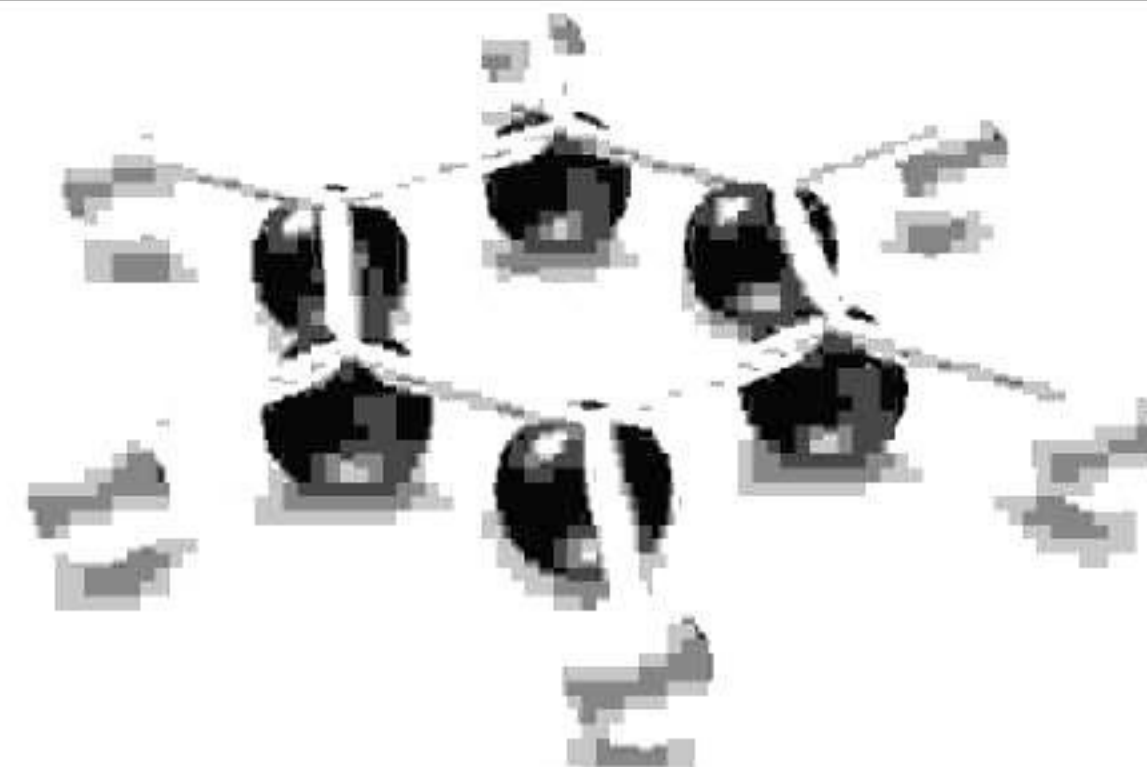
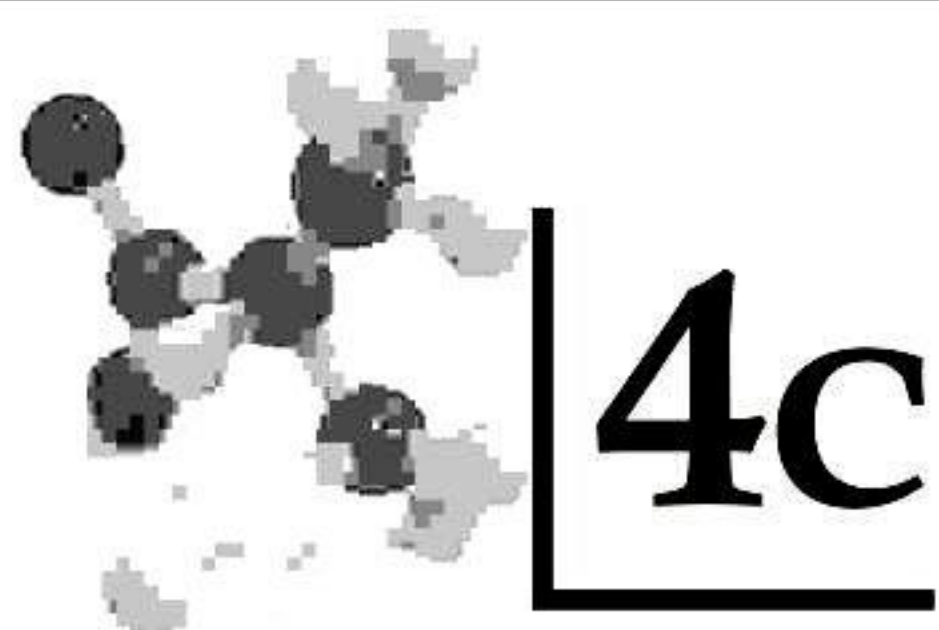




HYDROCARBONS (ALKYNES)

Level - 1

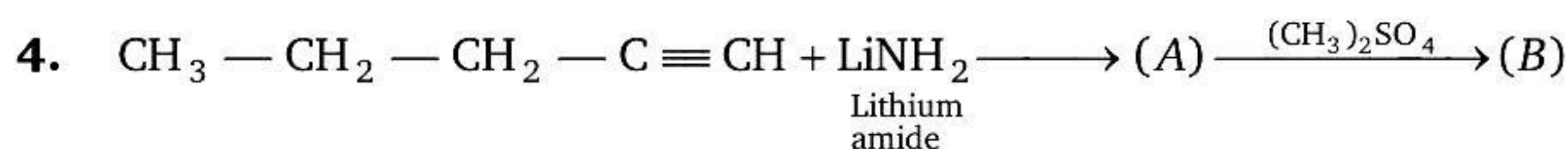
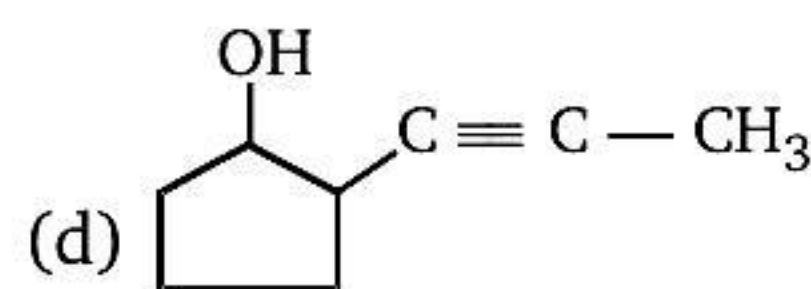
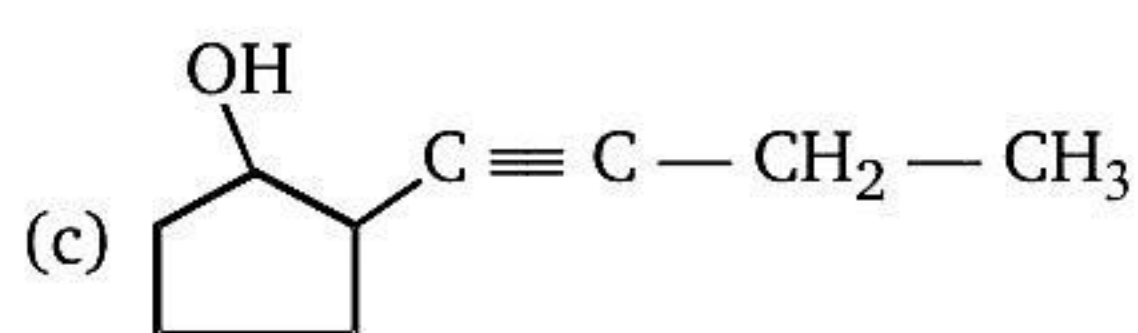
- $\xrightarrow[0^\circ\text{C}]{\text{PCl}_5}$ (A) $\xrightarrow[70-80\%]{(1) 3\text{NaNH}_2, \text{ mineral oil}, (2) \text{H}^+}$ (B) ; Product (B) is : 46%

(a)
 (b)
 (c)
 (d)
- $\xrightarrow[\text{CCl}_4]{\text{Br}_2}$ $\xrightarrow[\text{(ii) NaNH}_2]{\text{(i) alc. KOH}}$ (A) ; Product (A) is : major

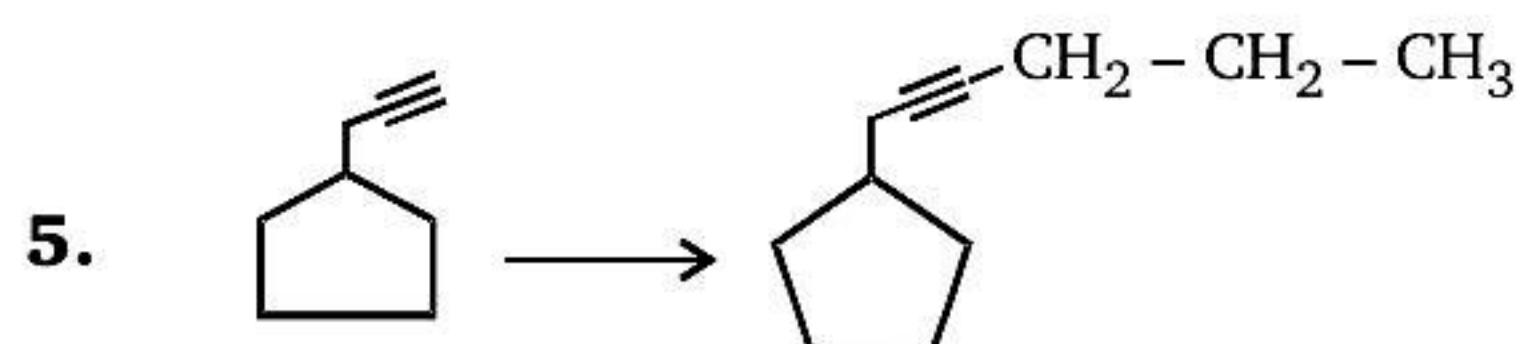
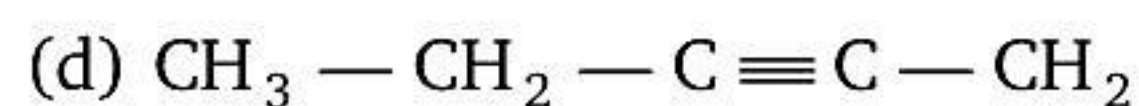
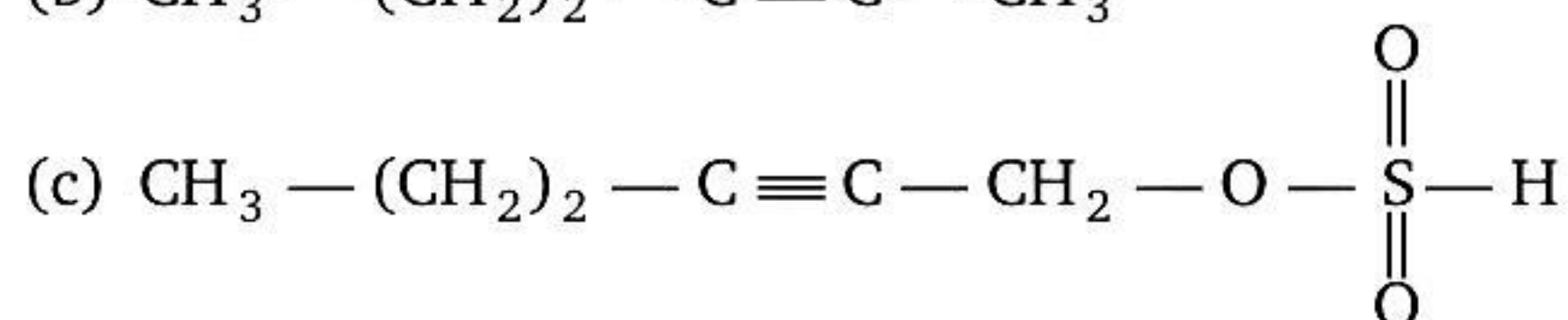
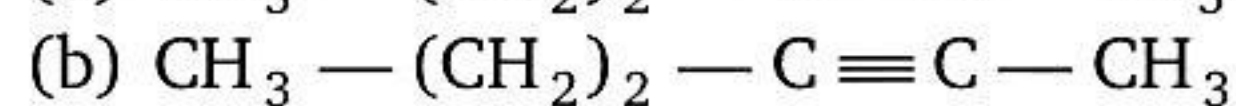
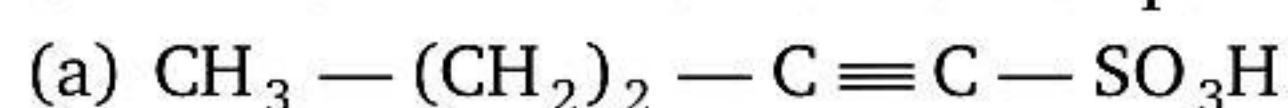
(a) $\text{H}_2\text{C}=\text{CH}-\text{CH}=\text{CH}_2$ (b) $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3$
 (c) $\text{CH}_3-\text{CH}_2-\text{C}\equiv\text{CH}$ (d) $\text{CH}_3-\text{CH}=\text{C}=\text{CH}_2$
- $\text{CH}_3\text{CH}_2\text{C}\equiv\text{CH} \xrightarrow[\text{liq. NH}_3]{\text{NaNH}_2} \text{I} \xrightarrow[\text{Et}_2\text{O}]{\text{cyclohexanone}} \text{J} \xrightarrow{\text{H}^+} (\text{K})$

Product (K) of the above reaction is :

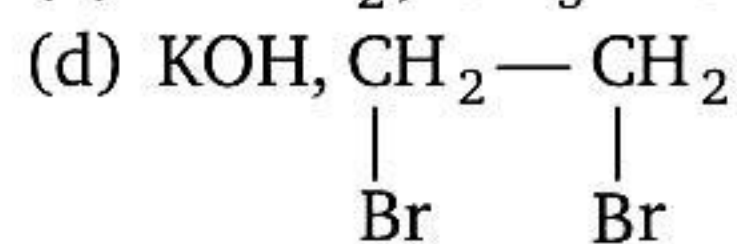
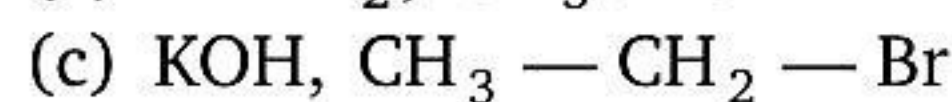
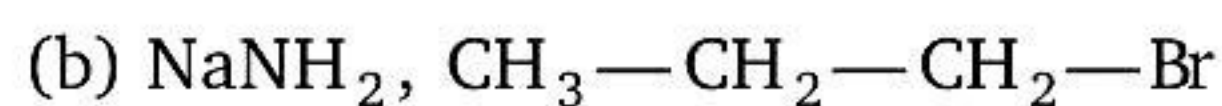
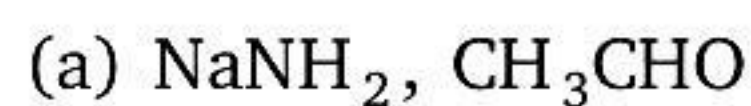
(a)
 (b)



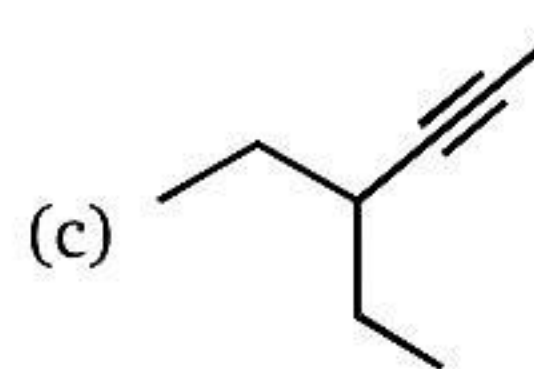
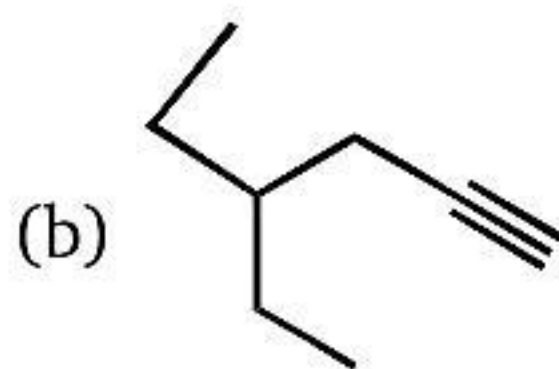
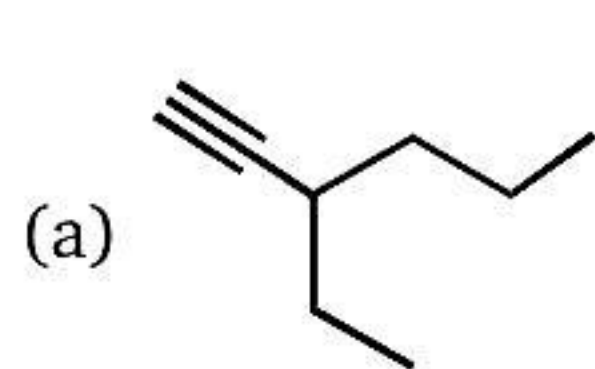
Give the structural formula of compound (B) :



; This conversion can be achieved by :

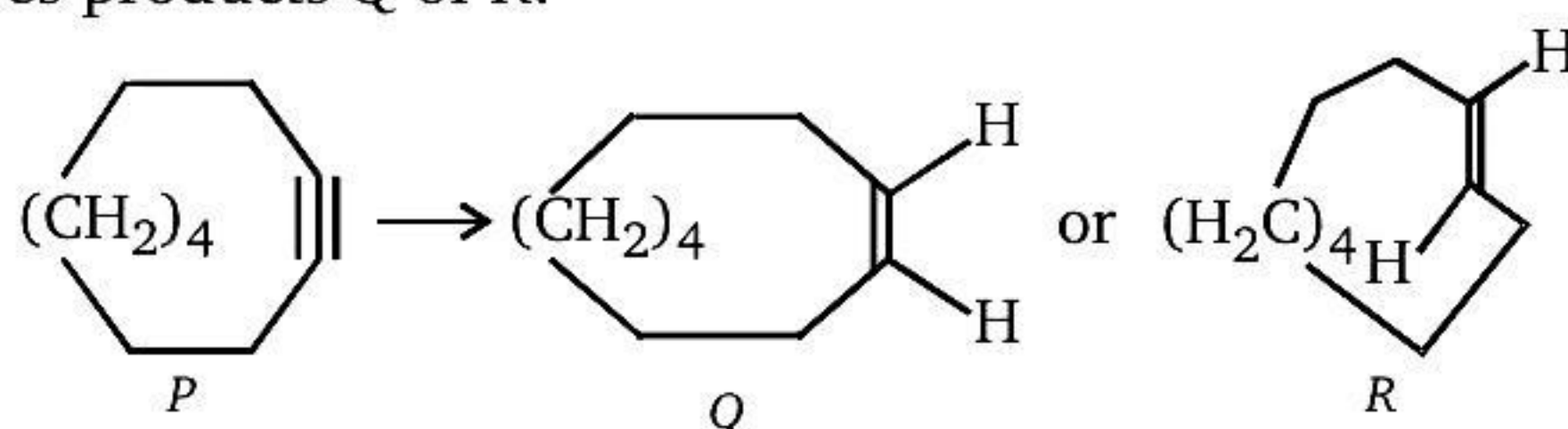


6. Which alkyne will give 3-ethylhexane on catalytic hydrogenation ?

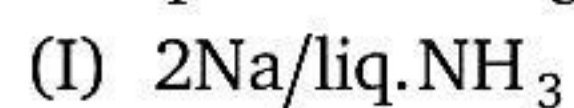


(d) All of these

7. Reactant P gives products Q or R.



The possible reagents are :



The correct statement with respect to the above conversion is/are :

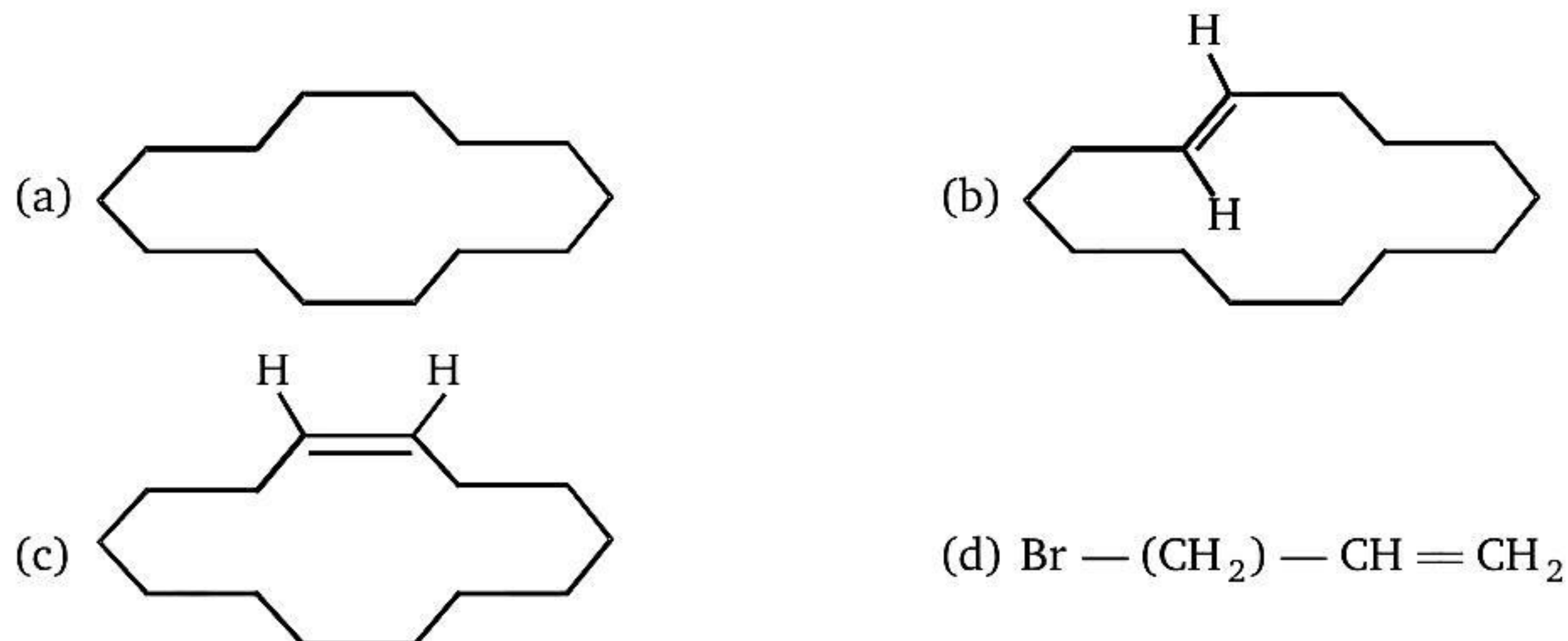
(a) Q is obtained on treatment with reagent (I)

(b) R and Q are obtained on treatment with reagent (II)

(c) R is obtained on treatment with reagent (I)

(d) R is obtained on treatment with reagent (II)

8. $\text{Br} - (\text{CH}_2)_{12} - \text{C} \equiv \text{CH} \xrightarrow{\text{NaNH}_2} (A) \xrightarrow[\text{Catalyst}]{\text{Lindlar}} (B)$; Product (B) is :



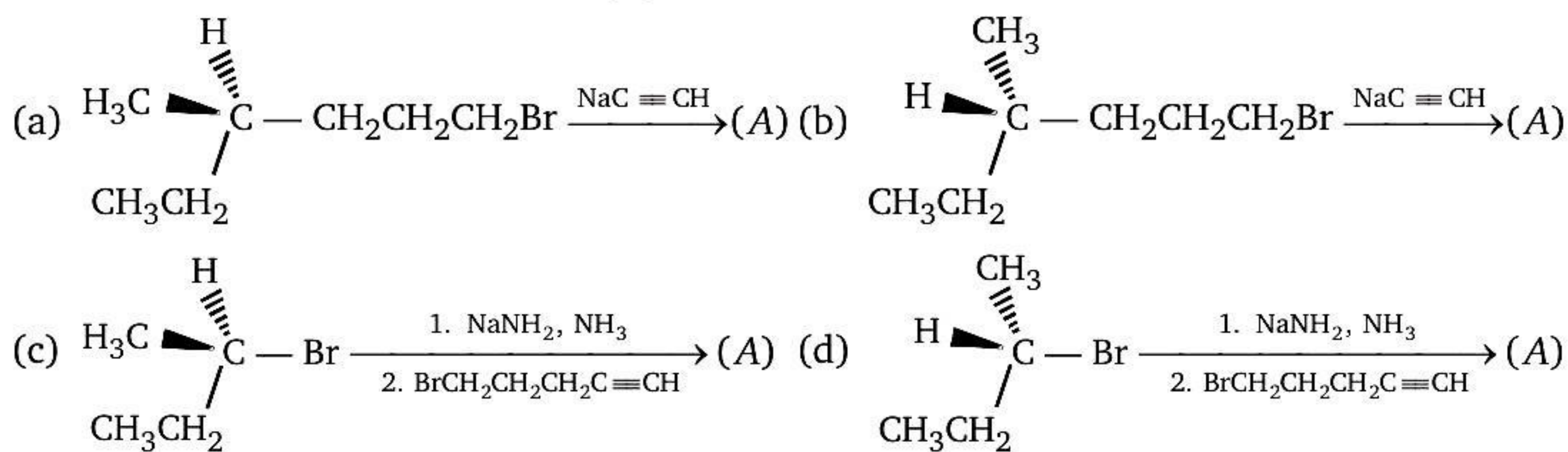
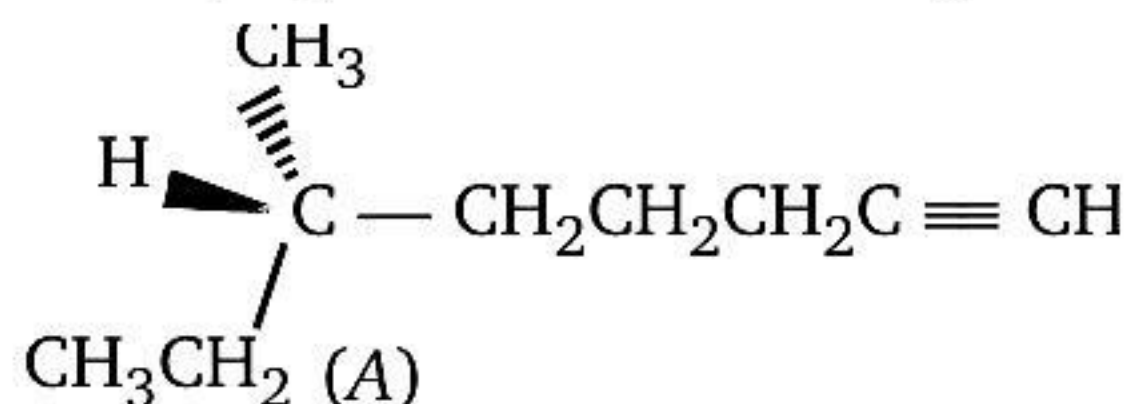
9. $\text{Ph} - \text{C} \equiv \text{CH} \xrightarrow[\text{MeOH}]{\text{MeO}^-}$ Major product of the reaction is :



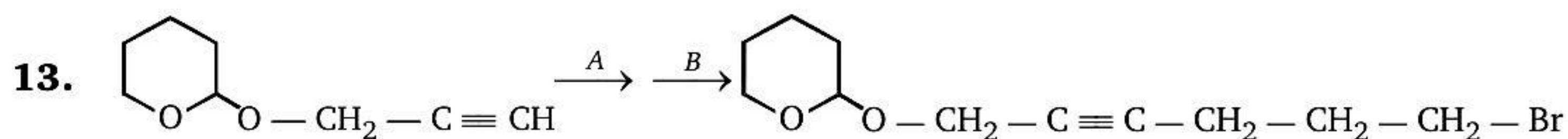
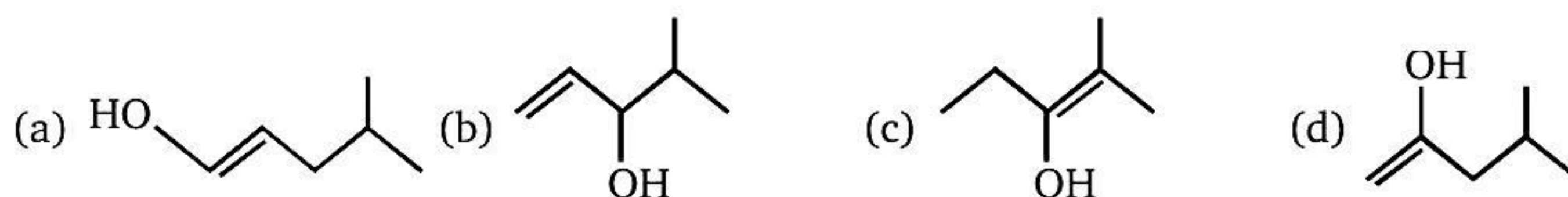
10. $\text{Ph} - \underset{\text{Cl}}{\overset{\text{Cl}}{\text{C}}} - \text{CH}_3 \xrightarrow[Product]{3\text{NaNH}_2} (A)$; Product (A) is :



11. Which combination is best for preparation of the compound (A) shown below ?

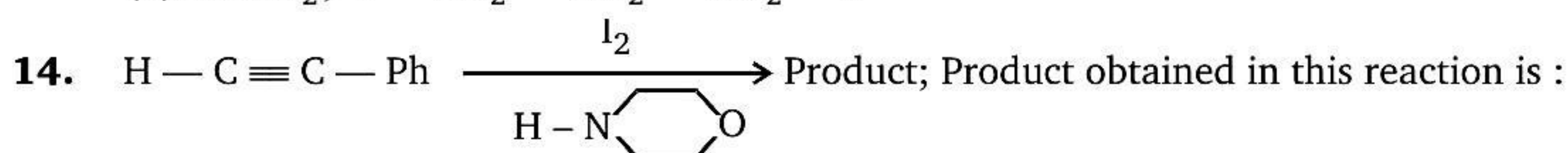


12. Which one of the following is the intermediate in the preparation of a ketone by hydration of an alkyne in the presence of sulfuric acid and mercury (II) sulphate ?

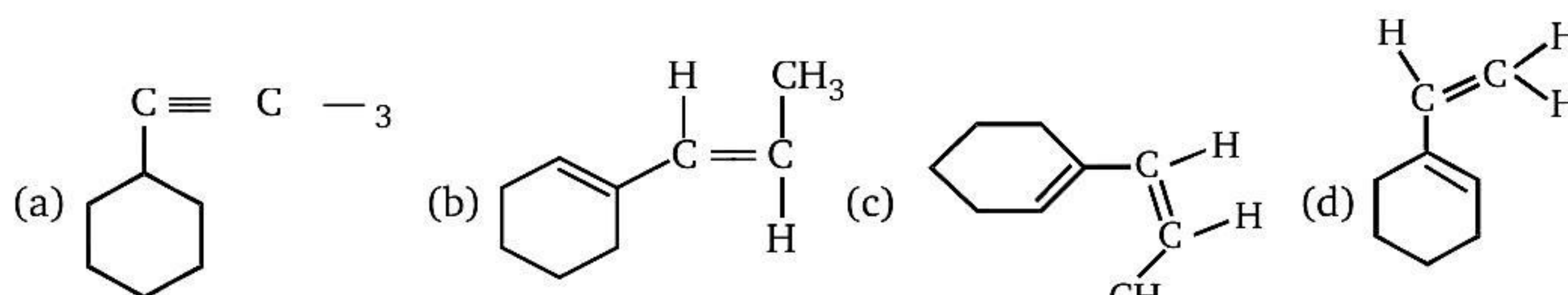
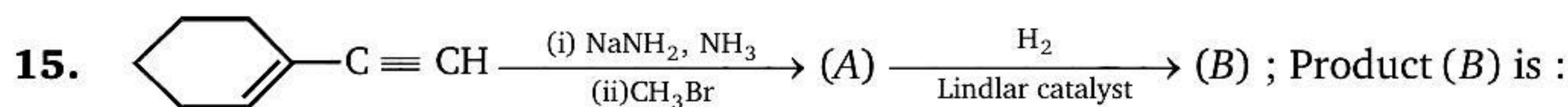


To carry out above conversion, (A) and (B) respectively, are :

- (a) $\text{NaNH}_2, \text{Cl}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{Br}$
 (b) $\text{NaNH}_2, \text{F}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{Br}$
 (c) $\text{NaNH}_2, \text{I}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{Br}$
 (d) $\text{NaNH}_2, \text{I}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{I}$

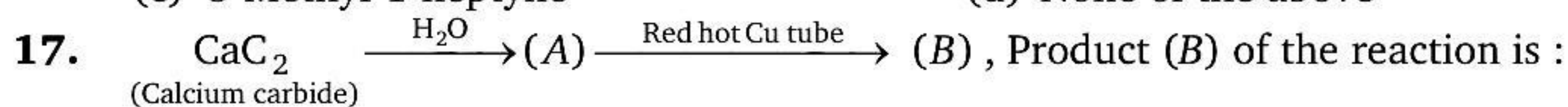


- (a) $\text{Ph}-\text{C}(\text{I})=\text{CH}-\text{I}$ (b) $\text{Ph}-\text{CH}(\text{I})-\text{CH}_2-\text{I}$
 (c) $\text{Ph}-\text{C}(\text{I})\equiv\text{C}-\text{I}$ (d) $\text{I}-\text{C}\equiv\text{C}-\text{H}$



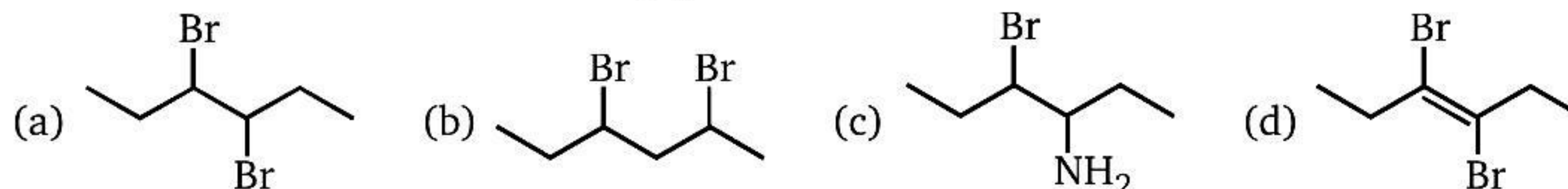
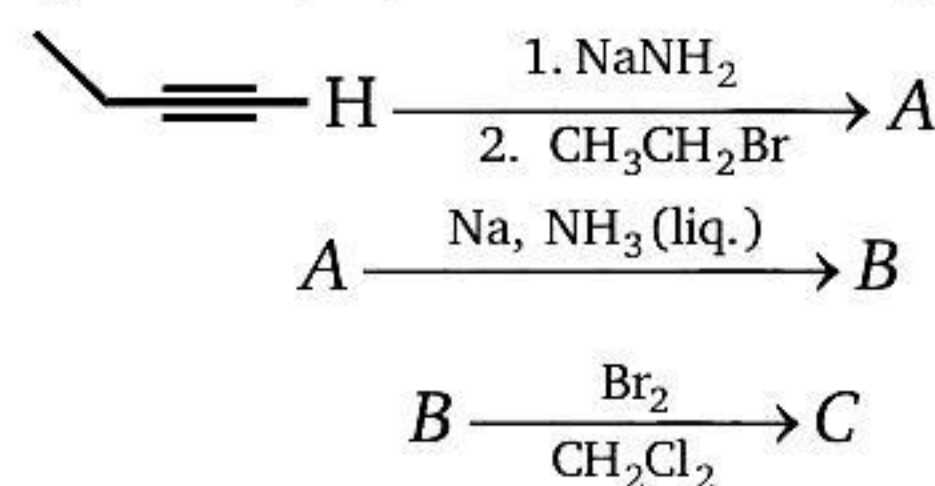
16. Which of the following alkyne on treatment with H_2 (2 mole)/ Pt gives an optically inactive compound ?

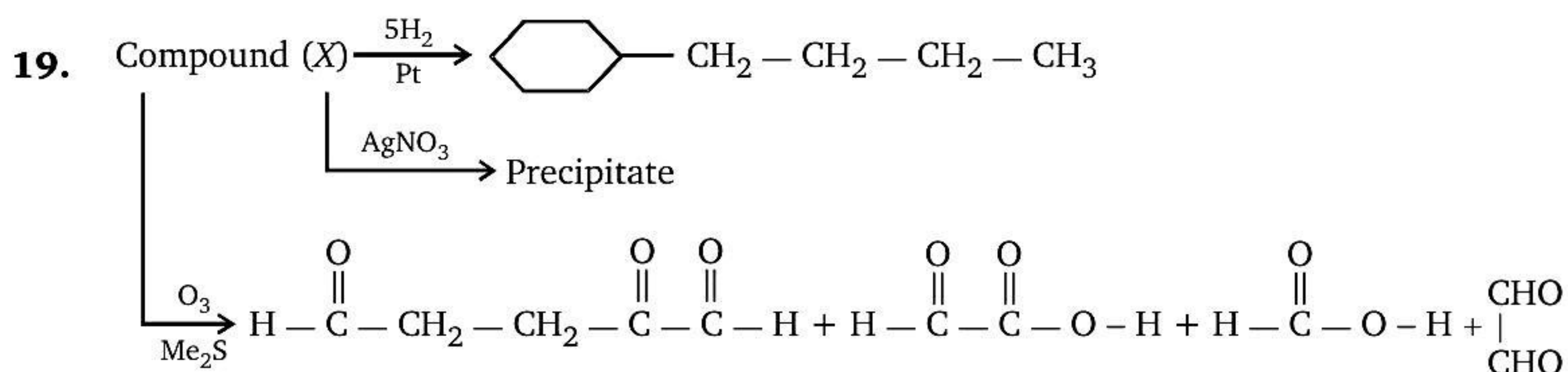
- (a) 3-Methyl-1-pentyne (b) 4-Methyl-1-hexyne
 (c) 3-Methyl-1-heptyne (d) None of the above



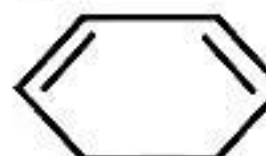
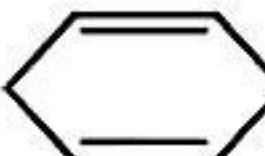
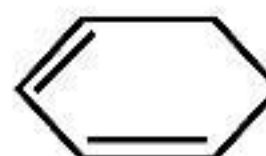
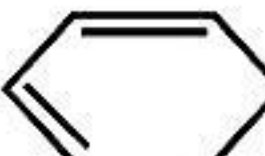
- (a) Toluene (b) Ethyl-benzene (c) Benzene (d) Butyne

18. What is the final product, C, of the following reaction sequence ?





Compound (X) will be :

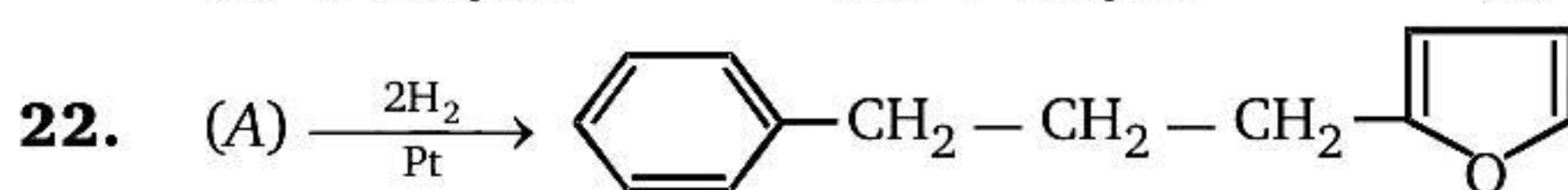
- (a) -CH=CH-C≡CH (b) =CH-CH₂-C≡CH
- (c) =CH-CH₂-C≡CH (d) =C=CH-C≡CH

20. Choose the sequence of steps that describes the best synthesis of 1-butene from ethanol :

- (a) (1) NaC≡CH ; (2) H₂, Lindlar Pd
 (b) (1) NaC≡CH ; (2) Na, NH₃
 (c) (1) HBr, heat ; (2) NaC≡CH ; (3) H₂, Lindlar Pd
 (d) (1) HBr, heat ; (2) KOC(CH₃)₃, DMSO ; (3) NaC≡CH ; (4) H₂, Lindlar catalyst

21. Which alkyne yields butanoic acid (CH₃CH₂CH₂CO₂H) as the only organic product on treatment with ozone followed by the hydrolysis ?

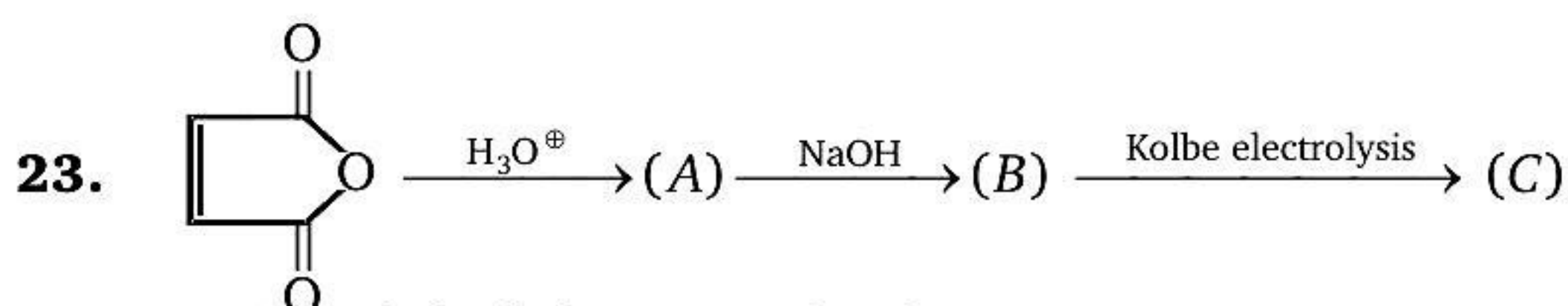
- (a) 1-Butyne (b) 4-Octyne (c) 1-Pentyne (d) 2-Hexyne



Carlina oxide

Unit of unsaturation in compound (A) ?

- (a) 7 (b) 8 (c) 9 (d) 10



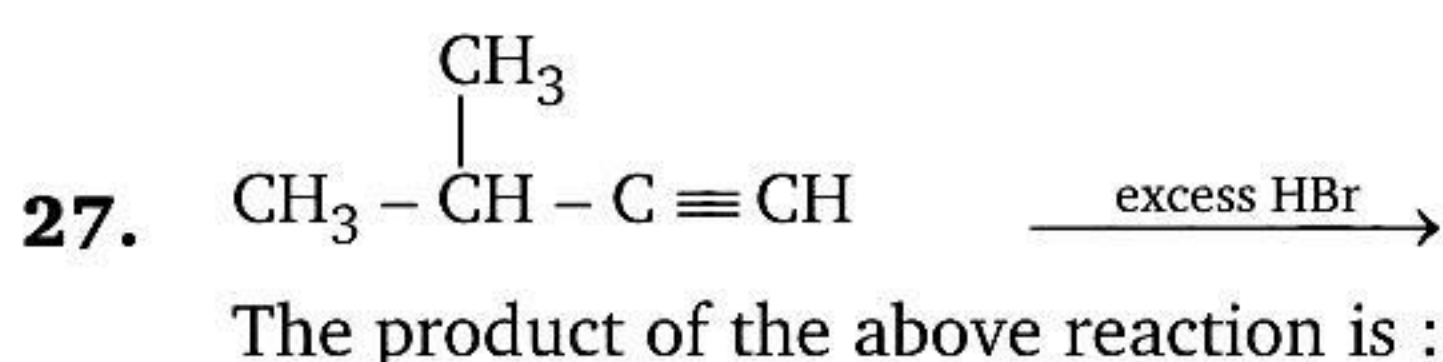
Product (C) of above reaction is:

- (a) H₂C=CH₂ (b) CH₃-C≡C-CH₃
 (c) HC≡CH (d) CH₃-CH=CH-CH₃

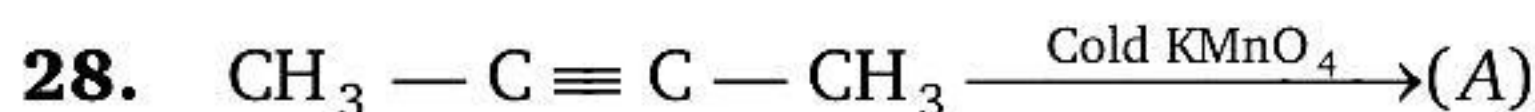
24. To convert 1-butyne to 1-D-butanol, one would carry out the following steps :

- (I) Sodium amide, then D₂O
 (II) Disiamylborane, then hydrogen peroxide/sodium hydroxide
 (III) The transformation can not be carried out with the indicated reagents.
 (a) I, followed by II (b) II, followed by I (c) III (d) II

25. An unknown compound (A) has a molecular formula C_4H_6 . When (A) is treated with excess of Br_2 a new substance (B) with formula $C_4H_6Br_4$ is formed. (A) forms a white ppt. with ammonical silver nitrate solution. (A) may be :
- (a) But-1-yne (b) But-2-yne
(c) But-1-ene (d) But-2-ene
26. One mole of 1,2-dibromopropane on treatment with X moles of $NaNH_2$ followed by treatment with ethyl bromide gave a pentyne. The value of X is :
- (a) One (b) Two (c) Three (d) Four



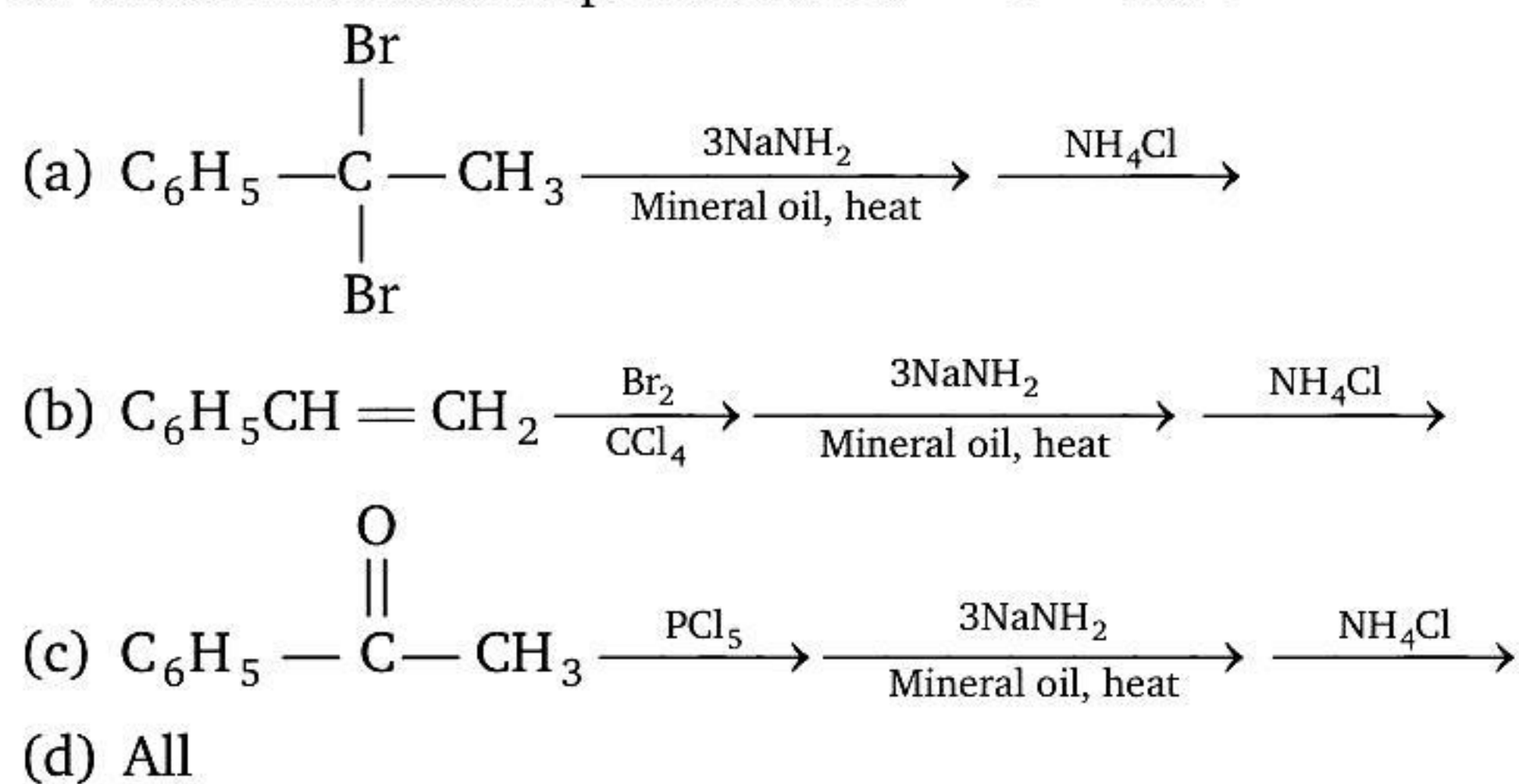
- (a) $CH_3 - \overset{\overset{CH_3}{|}}{CH} - \overset{\overset{Br}{|}}{CH} - \overset{\overset{Br}{|}}{CH_2}$ (b) $CH_3 - \overset{\overset{CH_3}{|}}{CH} - \overset{\overset{Br}{|}}{C} = CH_2$
(c) $CH_3 - \overset{\overset{CH_3}{|}}{CH} - \overset{\overset{Br}{|}}{\underset{\underset{Br}{|}}{C}} - CH_3$ (d) $CH_3 - \overset{\overset{CH_3}{|}}{CH} - CH_2 - \overset{\overset{Br}{|}}{\underset{\underset{Br}{|}}{CH}}$



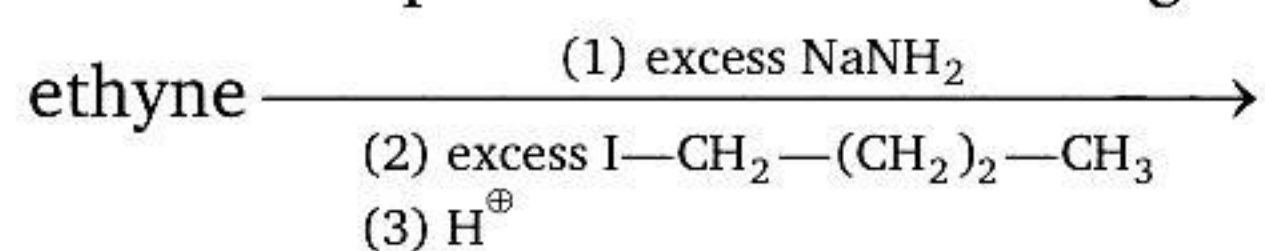
Product (A) is:

- (a) $CH_3 - CH_2 - \overset{\overset{O}{||}}{C} - \overset{\overset{O}{||}}{C} - H$ (b) $CH_3 - \overset{\overset{O}{||}}{C} - \overset{\overset{O}{||}}{C} - CH_3$
(c) $CH_3 - \overset{\overset{OH}{|}}{CH} - \overset{\overset{OH}{|}}{CH} - CH_3$ (d) $O = CH - CH_2 - CH_2CH = O$

29. In which reaction last product is $Ph - C \equiv CH$?



30. Predict the product of the following reaction sequence.

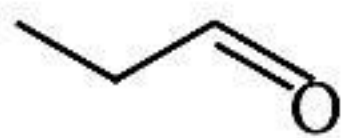
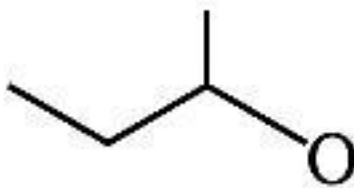
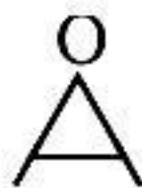
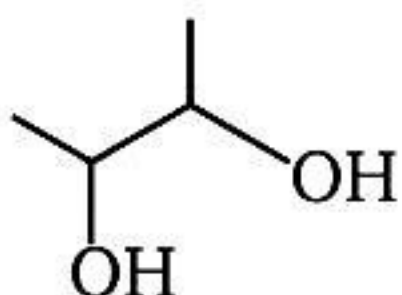


- (a) 6-iodo-1-hexyne (b) 1-hexyne
(c) 5-decyne (d) 1-iodo-1-hexene

31. The best sequence of reactions to prepare 2-heptanone is

- (a) propyne $\xrightarrow{\text{NaNH}_2} X \xrightarrow{n\text{-C}_4\text{H}_9\text{Br}} Y \xrightarrow[\text{H}_2\text{SO}_4]{\text{H}_2\text{O, Hg}^{2+}}$
(b) ethyne $\xrightarrow{\text{NaNH}_2} X \xrightarrow{n\text{-C}_5\text{H}_{12}\text{Br}} Y \xrightarrow[\text{H}_2\text{SO}_4]{\text{H}_2\text{O, Hg}^{2+}}$
(c) 1-hexyne $\xrightarrow{\text{NaNH}_2} X \xrightarrow{\text{CH}_2\text{Br}} Y \xrightarrow[\text{H}_2\text{SO}_4]{\text{H}_2\text{O, Hg}^{2+}}$
(d) 1-pentyne $\xrightarrow{\text{NaNH}_2} X \xrightarrow{\text{C}_2\text{H}_5\text{Br}} Y \xrightarrow[\text{H}_2\text{SO}_4]{\text{H}_2\text{O, Hg}^{2+}}$

32. The major product of the reaction of 2-butene with cold alkaline KMnO_4 , is

- (a)  (b)  (c)  (d) 

ANSWERS — LEVEL 1

1.	(b)	2.	(b)	3.	(b)	4.	(b)	5.	(b)	6.	(d)	7.	(c)	8.	(c)
9.	(b)	10.	(d)	11.	(b)	12.	(d)	13.	(c)	14.	(c)	15.	(c)	16.	(a)
17.	(c)	18.	(a)	19.	(a)	20.	(c)	21.	(b)	22.	(c)	23.	(c)	24.	(c)
25.	(a)	26.	(c)	27.	(c)	28.	(b)	29.	(d)	30.	(c)	31.	(b)	32.	(d)