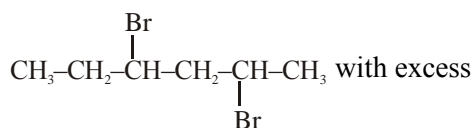


HALOGEN DERIVATIVE

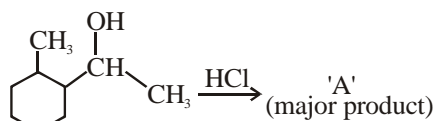
1. The product formed in the first step of the reaction of



Mg/Et₂O (Et = C₂H₅) is :

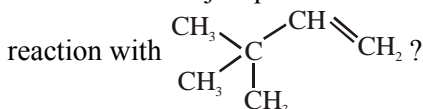
- (1) $\text{CH}_3\text{-CH}_2\text{-CH-CH}_2\text{-CH-CH}_3$
 $\text{CH}_3\text{-CH-CH}_2\text{-CH-CH}_2\text{-CH}_3$
- (2) $\text{CH}_3\text{-CH}_2\text{-CH-CH}_2\text{-CH-CH}_3$
 $\text{CH}_3\text{-CH}_2\text{-CH-CH}_2\text{-CH-CH}_3$
- (3) $\text{CH}_3\text{-CH}$ $\begin{matrix} \text{CH}_2 \\ | \\ \text{CH-CH}_3 \end{matrix}$
- (4) $\text{CH}_3\text{CH}_2\text{-}\overset{\text{MgBr}}{\underset{\text{MgBr}}{\text{C}}}\text{-CH}_2\text{-CH-CH}_3$

2. What is the final product (major) 'A' in the given reaction ?



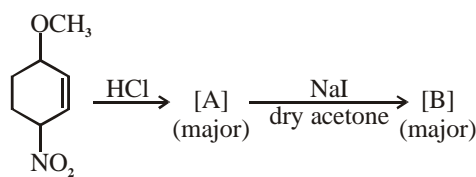
- (1) $\text{Cyclohexane ring with } \text{CH}_2\text{-CH}_3 \text{ and } \text{CH}_3 \text{ substituents}$
- (2) $\text{Cyclohexane ring with } \text{CH}=\text{CHCH}_3 \text{ and } \text{CH}_3 \text{ substituents}$
- (3) $\text{Cyclohexane ring with } \text{CH}=\text{CH}_2 \text{ and } \text{CH}_3 \text{ substituents}$
- (4) $\text{Cyclohexane ring with } \text{CH}(\text{Cl})\text{CH}_3 \text{ and } \text{CH}_3 \text{ substituents}$

3. What is the major product formed by HI on reaction with



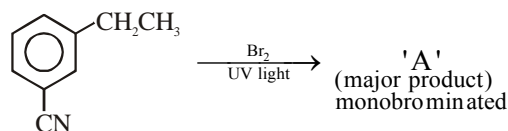
- (1) $\text{CH}_3\text{-}\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}\text{-CH-CH}_2\text{I}$
- (2) $\text{CH}_3\text{-}\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}\text{-CH-CH}_3$
 I
- (3) $\text{CH}_3\text{-}\overset{\text{CH}_3}{\underset{\text{I}}{\text{C}}}\text{-CH-CH}_3$
 CH_3
- (4) $\text{CH}_3\text{-CH-CH-CH}_2\text{-CH}_3$
 $\text{CH}_3 \quad \text{I}$

4. Identify A and B in the chemical reaction.



- (1) A = $\text{Cyclohexane ring with } \text{OCH}_3, \text{Cl}, \text{NO}_2$
- B = $\text{Cyclohexane ring with } \text{OCH}_3, \text{Cl}, \text{NO}_2$
- (2) A = $\text{Cyclohexane ring with } \text{OCH}_3, \text{Cl}, \text{NO}_2$
- B = $\text{Cyclohexane ring with } \text{I}, \text{Cl}, \text{NO}_2$
- (3) A = $\text{Cyclohexane ring with } \text{OCH}_3, \text{Cl}, \text{NO}_2$
- B = $\text{Cyclohexane ring with } \text{I}, \text{Cl}, \text{NO}_2$
- (4) A = $\text{Cyclohexane ring with } \text{OCH}_3, \text{Cl}, \text{NO}_2$
- B = $\text{Cyclohexane ring with } \text{OCH}_3, \text{I}, \text{NO}_2$

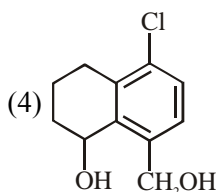
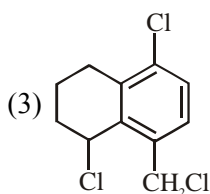
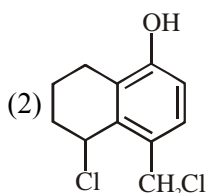
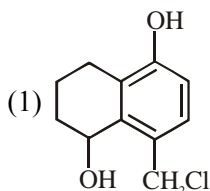
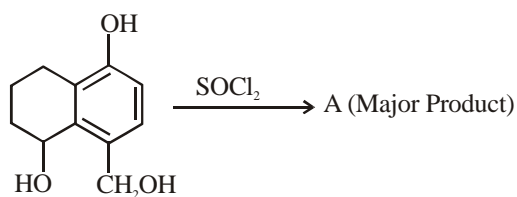
5. For the given reaction :



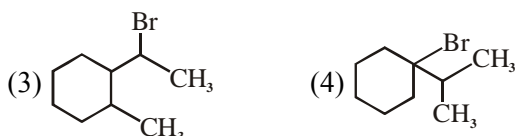
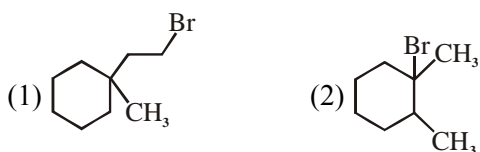
What is 'A'?

- (1) $\text{Cyclohexane ring with } \text{CH}_2\text{CH}_3, \text{Br}, \text{CN}$
- (2) $\text{Cyclohexane ring with } \text{CH}_2\text{CH}_3, \text{Br}, \text{CN}$
- (3) $\text{Cyclohexane ring with } \text{Br-CH(CH}_3\text{)}, \text{CN}$
- (4) $\text{Cyclohexane ring with } \text{CH}_2\text{CH}_3, \text{Br}, \text{CN}$

6. Identify A in the given reaction.



7. A (Major product)

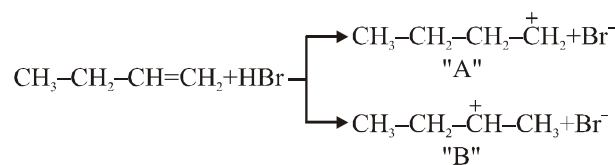


8. The correct pair(s) of the ambident nucleophiles is (are) :

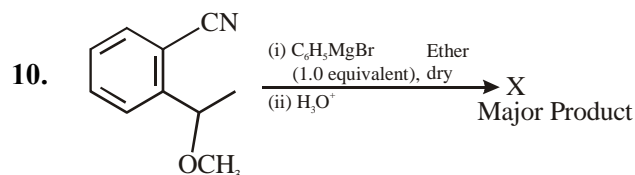
- (A) AgCN/KCN
 (B) RCOOAg/RCOOK
 (C) AgNO₂/KNO₂
 (D) AgI/KI

- (1) (B) and (C) only (2) (A) only
 (3) (A) and (C) only (4) (B) only

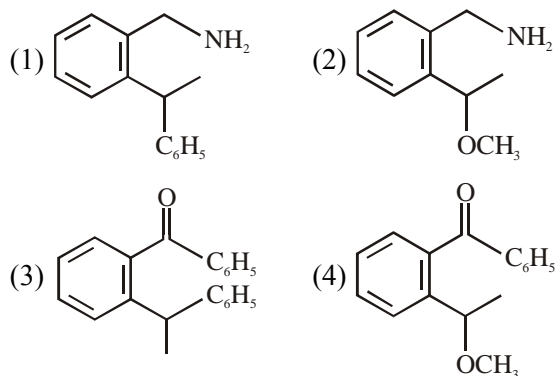
9. Choose the correct statement regarding the formation of carbocations A and B given :-



- (1) Carbocation B is more stable and formed relatively at faster rate
 (2) Carbocation A is more stable and formed relatively at slow rate
 (3) Carbocation B is more stable and formed relatively at slow rate
 (4) Carbocation A is more stable and formed relatively at faster rate



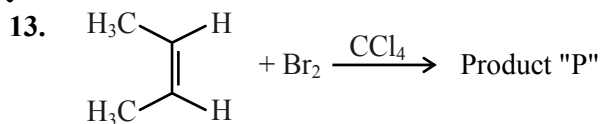
The structure of X is :



11. In the given reaction 3-Bromo-2, 2-dimethyl butane $\xrightarrow{\text{C}_2\text{H}_5\text{OH}}$ 'A' (Major Product) Product A is:

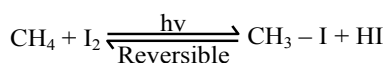
- (1) 2-Ethoxy-3, 3-dimethyl butane
 (2) 1-Ethoxy-3, 3-dimethyl butane
 (3) 2-Ethoxy-2, 3-dimethyl butane
 (4) 2-Hydroxy-3, 3-dimethyl butane

12. To synthesise 1.0 mole of 2-methylpropan-2-ol from Ethylethanoate _____ equivalents of CH₃MgBr reagent will be required. (Integer value)

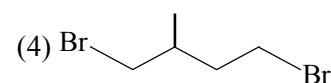
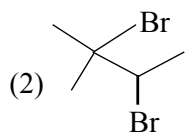
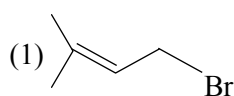
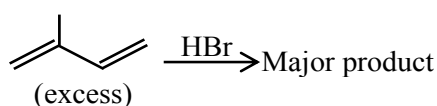


Consider the above chemical reaction. The total number of stereoisomers possible for Product 'P' is _____.

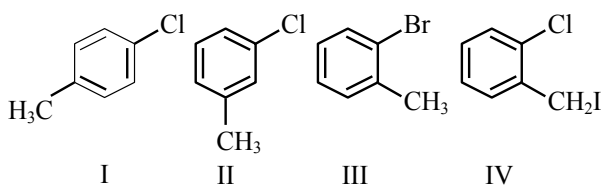
14. Presence of which reagent will affect the reversibility of the following reaction, and change it to a irreversible reaction :



- (1) HOCl
 (2) dilute HNO₂
 (3) Liquid NH₃
 (4) Concentrated HIO₃
15. The major product formed in the following reaction is :

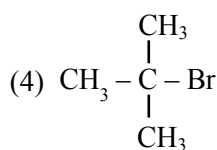
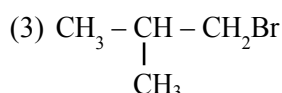
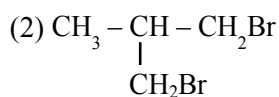
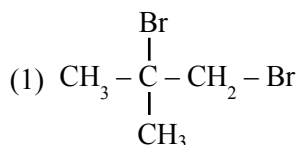


16. Among the following compounds I-IV, which one forms a yellow precipitate on reacting sequentially with (i) NaOH (ii) dil. HNO₃ (iii) AgNO₃?

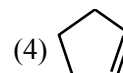
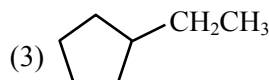
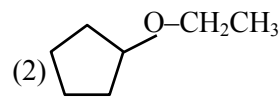
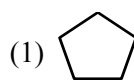
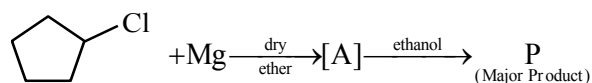


- (1) II (2) IV
 (3) I (4) III

17. Excess of isobutane on reaction with Br₂ in presence of light at 125°C gives which one of the following, as the major product?



18. In the following sequence of reactions the P is :



19. Given below are two statements :

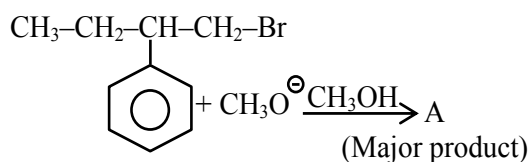
Statement I : Ethyl pent-4-ynoate on reaction with CH₃MgBr gives a 3°-alcohol.

Statement II : In this reaction one mole of ethyl pent-4-ynoate utilizes two moles of CH₃MgBr.

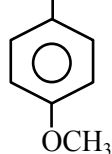
In the light of the above statements, choose the **most appropriate** answer from the options given below :

- (1) Both **Statement I** and **Statement II** are false.
 (2) **Statement I** is false but **Statement II** is true.
 (3) **Statement I** is true but **Statement II** is false.
 (4) Both **Statement I** and **Statement II** are true.

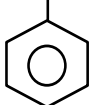
20. The major product (A) formed in the reaction given below is :



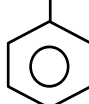
- (1) $\text{CH}_3\text{-CH}_2\text{-CH(CH}_2\text{Br)-C}_6\text{H}_5$



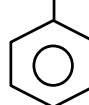
- (2) $\text{CH}_3\text{-CH}_2\text{-C(CH}_3\text{)=CH}_2$



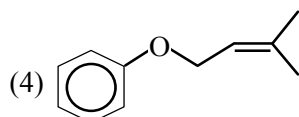
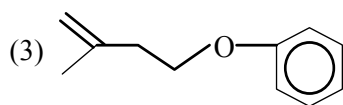
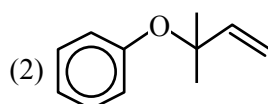
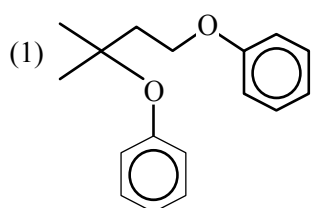
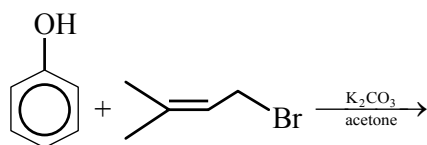
- (3) $\text{CH}_3\text{-CH}_2\text{-CH(CH}_2\text{OH)-C}_6\text{H}_5$



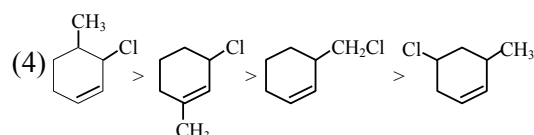
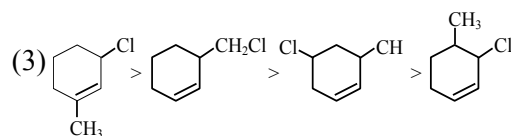
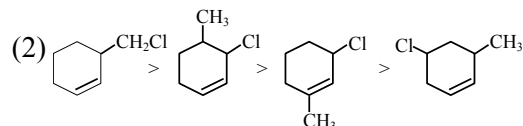
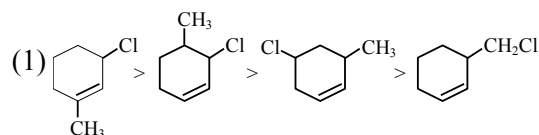
- (4) $\text{CH}_3\text{-CH}_2\text{-CH(CH}_2\text{OCH}_3\text{)-C}_6\text{H}_5$



21. The major product of the following reaction, if it occurs by $\text{S}_\text{N}2$ mechanism is :



22. The correct order of reactivity of the given chlorides with acetate in acetic acid is :



23. Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

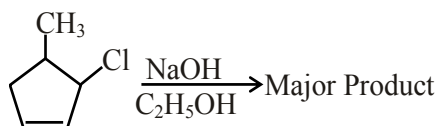
Assertion (A) : Treatment of bromine water with propene yields 1-bromopropan-2-ol.

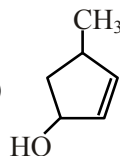
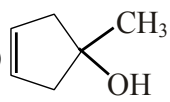
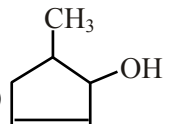
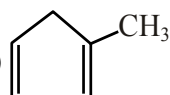
Reason (R) : Attack of water on bromonium ion follows Markovnikov rule and results in 1-bromopropan-2-ol.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

- (1) Both **(A)** and **(R)** are true but **(R)** is NOT the correct explanation of **(A)**
- (2) **(A)** is false but **(R)** is true.
- (3) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**
- (4) **(A)** is true but **(R)** is false

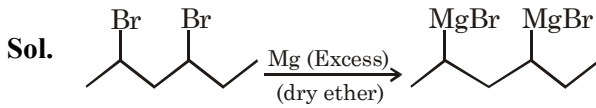
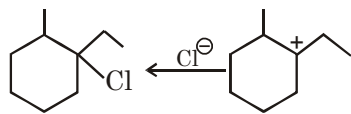
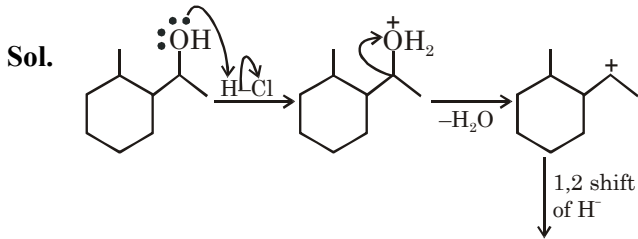
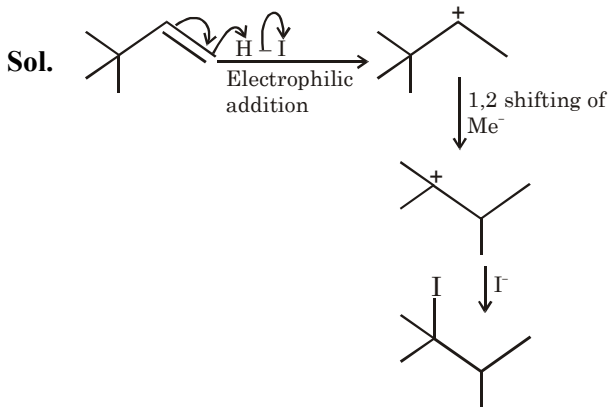
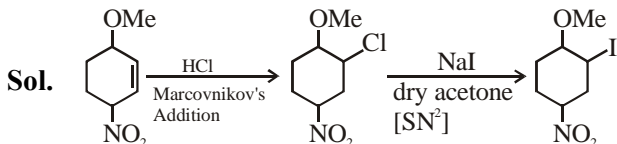
24. The major product of the following reaction is :



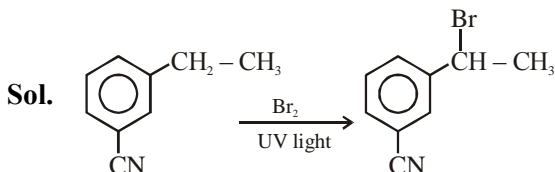
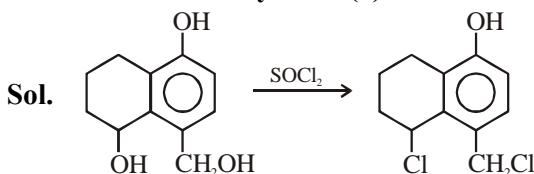
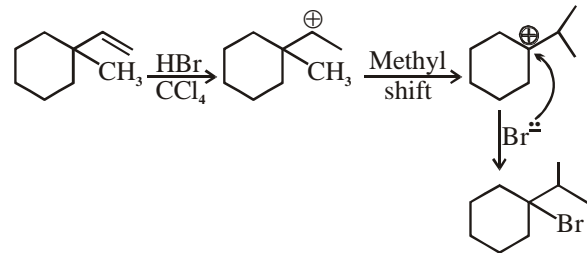
- (1) 
- (2) 
- (3) 
- (4) 

25. The stereoisomers that are formed by electrophilic addition of bromine to trans-but-2-ene is/are :

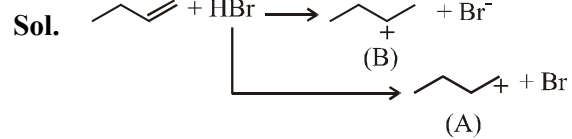
- (1) 2 enantiomers and 2 mesomers
- (2) 2 identical mesomers
- (3) 2 enantiomers
- (4) 1 racemic and 2 enantiomers

SOLUTION**1. Official Ans. by NTA (4)****2. Official Ans. by NTA (1)****3. Official Ans. by NTA (3)****4. Official Ans. by NTA (4)**

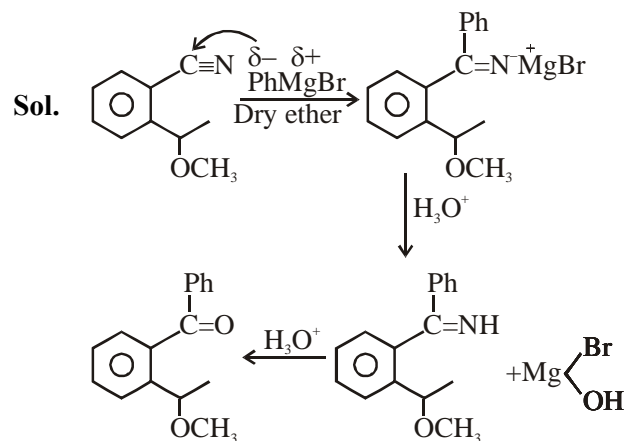
⇒ 1st reaction marcovnikov's addition of HCl on double bond while 2nd reaction is halide substitution by finkelstein reaction.

5. Official Ans. by NTA (3)**6. Official Ans by NTA (2)****7. Official Ans. by NTA (4)****Sol.****8. Official Ans. by NTA (3)****Sol.** Ambident nucleophile

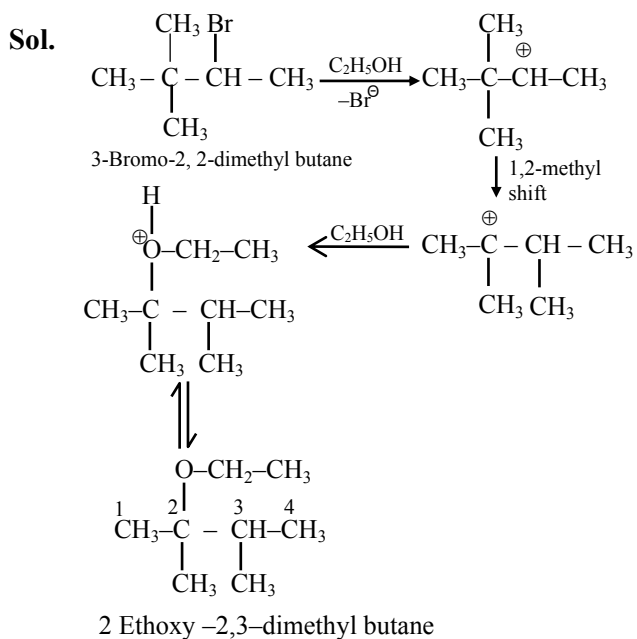
(A) KCN & AgCN

(C) AgNO₂ & KNO₂**9. Official Ans. by NTA (1)**

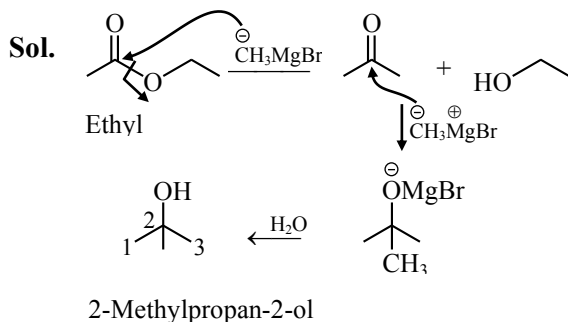
This is more stable due to secondary cation formation and formed with faster rate due to low activation energy.

10. Official Ans. by NTA (4)

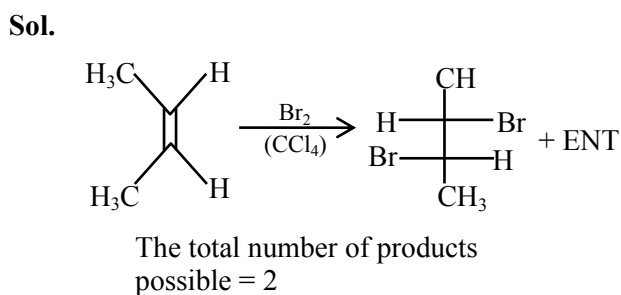
11. Official Ans. by NTA (3)



12. Official Ans. by NTA (2)



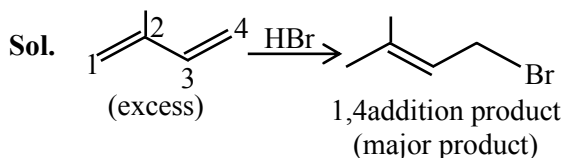
13. Official Ans. by NTA (2)



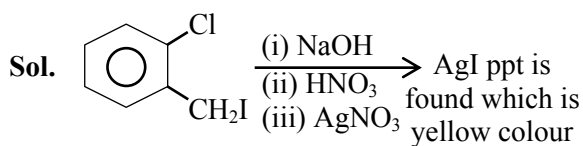
14. Official Ans. by NTA (4)

Sol. Iodination of alkane is reversible reaction. It can be irreversible in the presence of strong oxidising agent like conc. HNO₃ or conc. HIO₃

15. Official Ans. by NTA (1)

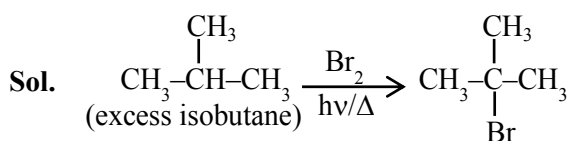


16. Official Ans. by NTA (2)

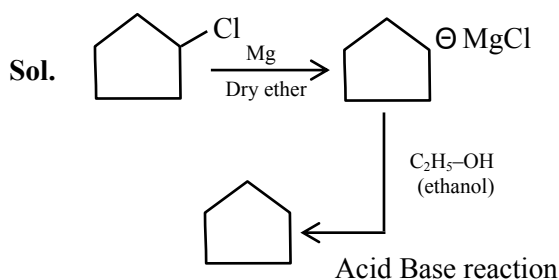


Other compounds halide can't be removed because corresponding C⁺ is highly unstable.

17. Official Ans. by NTA (4)

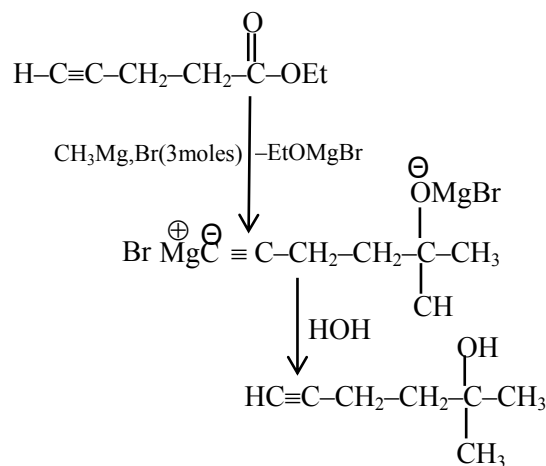


18. Official Ans. by NTA (1)

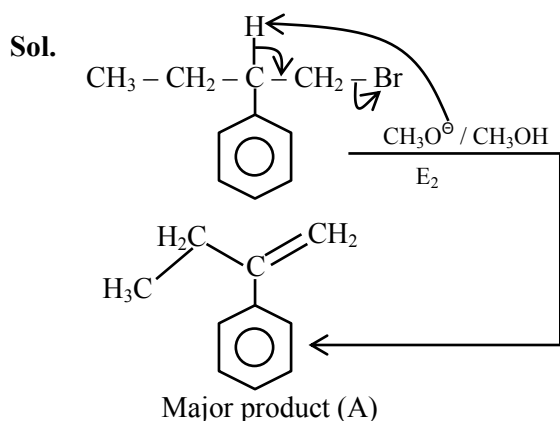


19. Official Ans. by NTA (3)

Sol. Statement 1 is true
But it consume 3 moles of G R
So statement 2 is false.

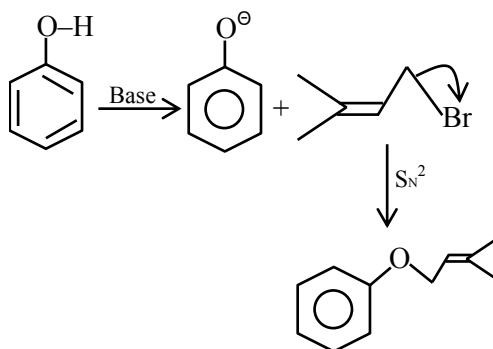


20. Official Ans. by NTA (2)

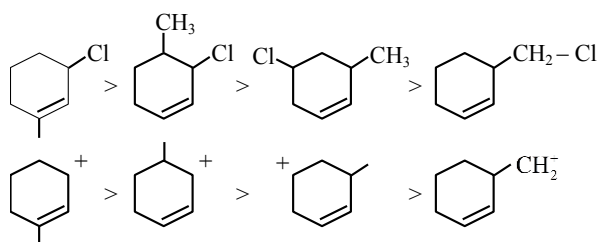


21. Official Ans. by NTA (4)

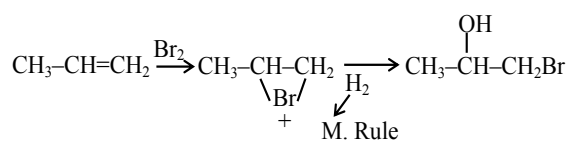
Sol.



22. Official Ans. by NTA (1)

Sol. As it is example of S_N1 .so carbocation stability \uparrow , reaction rate \uparrow 

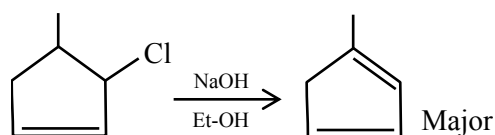
23. Official Ans. by NTA (3)



Its IUPAC name 1-bromopropan-2-ol

A and R are true and (R) is the correct explanation of (A)

24. Official Ans. by NTA (4)

Sol. NaOH + EtOH is known as alcoholic NaOH, so it give E^2 reaction with given alkyl halide.

25. Official Ans. by NTA (2)

