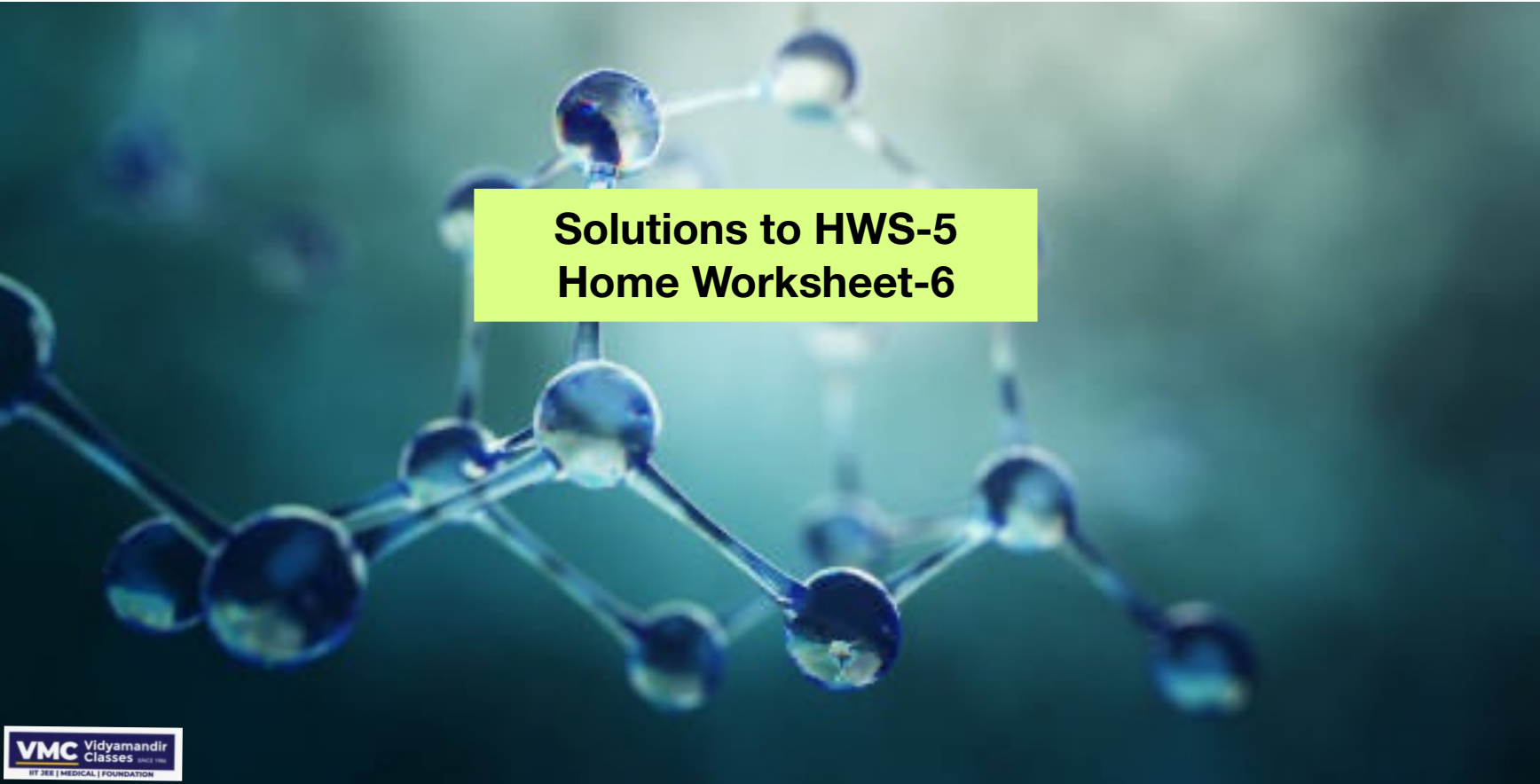
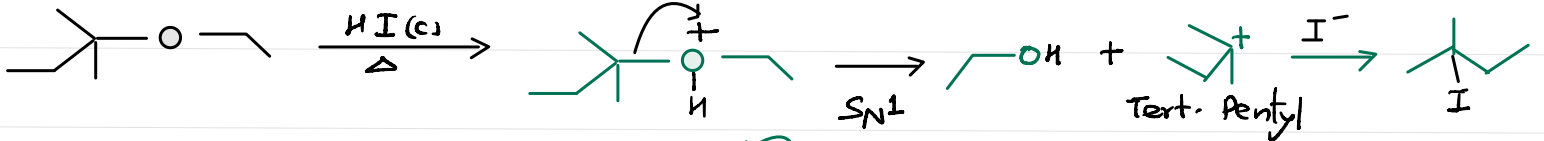


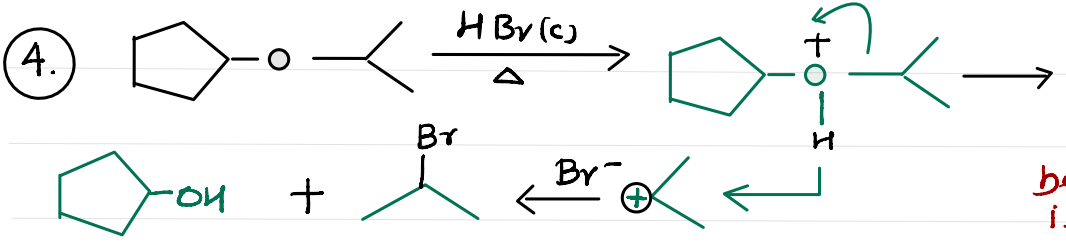
Solutions to HWS-5
Home Worksheet-6

Solutions

1. $CH_2=CH_2 \xrightarrow[H_2O]{Cl_2} CH_2(OH)-CH_2Cl \xrightarrow[H_2SO_4]{dil} CH_2Cl-CH_2-O-CH_2-CH_2Cl \xrightarrow[KOH,\ \Delta]{alc.} CH_2=CH-O-CH=CH_2$

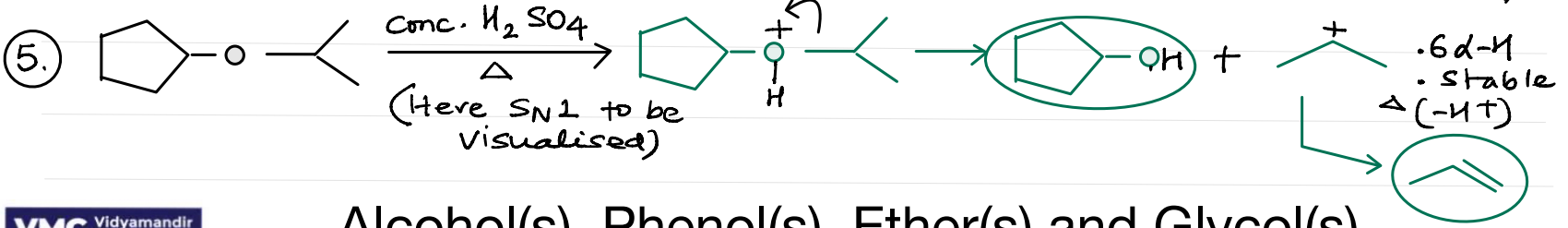
2. $Me_3C-O-CHMe_2 \xrightarrow[\Delta]{HI\ (c)} Me_3C-\overset{+}{O}(H)-CHMe_2 \xrightarrow{S_N1} Me_2CHOH + Me_3C-I\ (S_N1)$

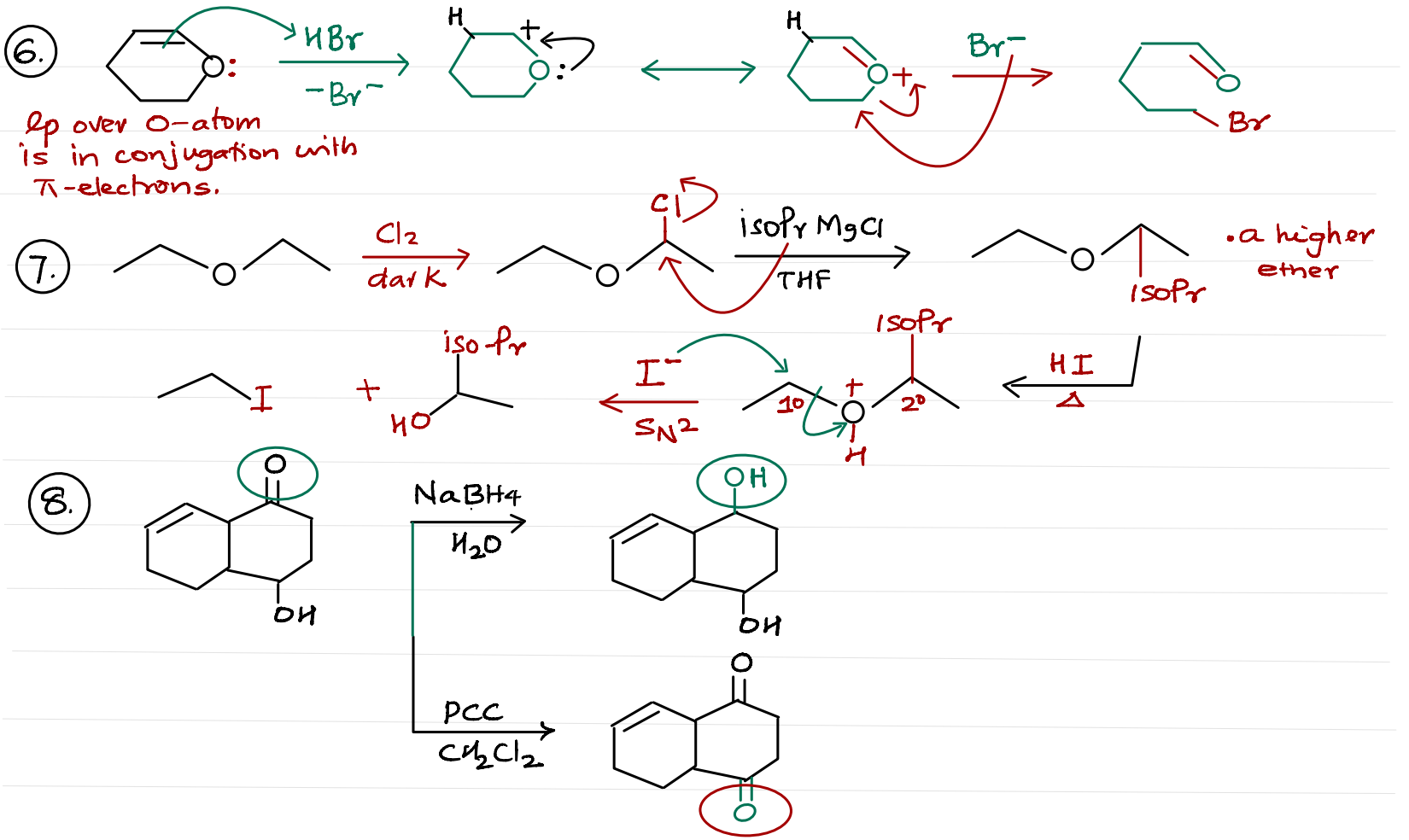
3. 

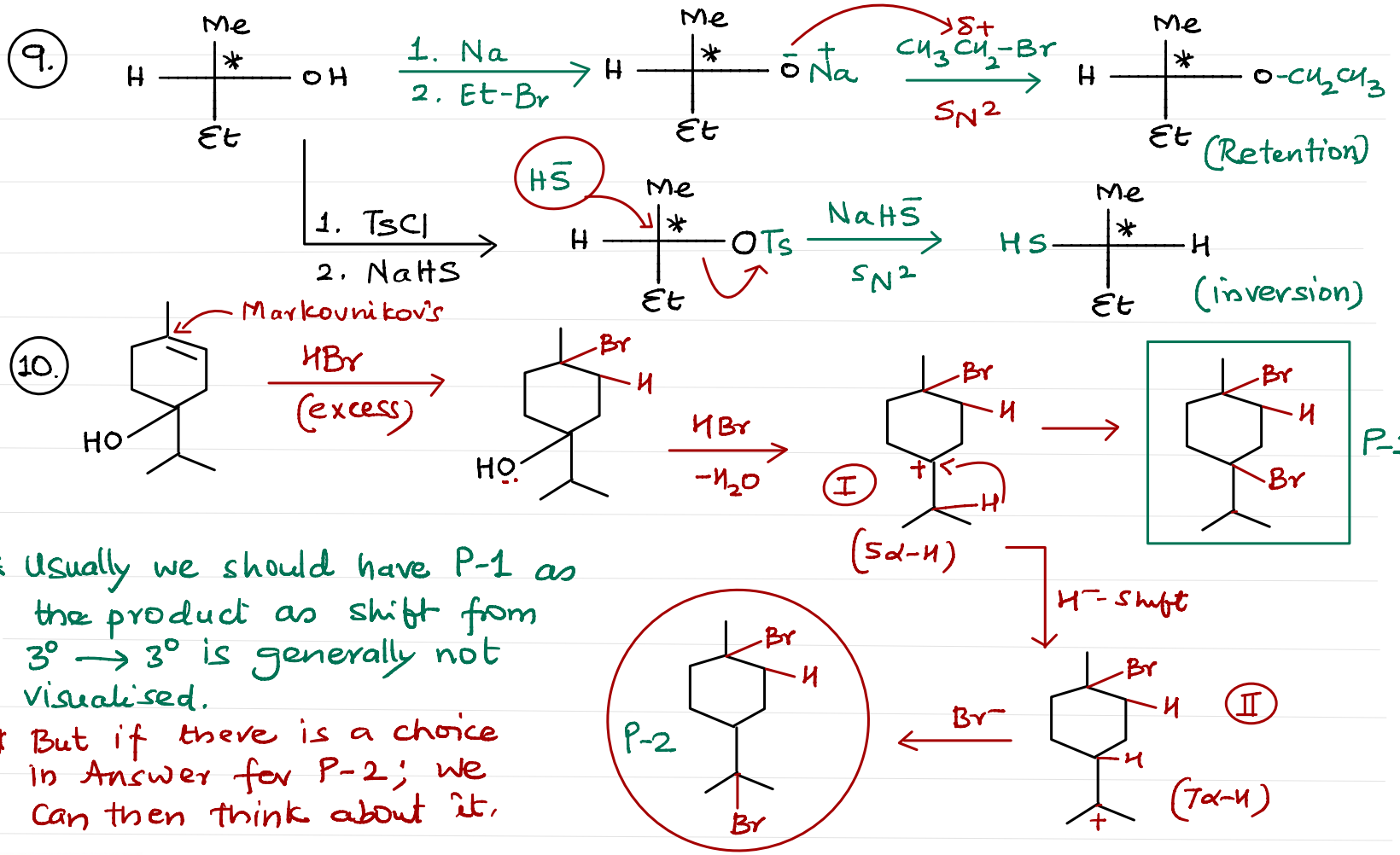
4. 

Here both S_N1 & S_N2 paths are possible as both sides are 2°. In such case, S_N1 becomes major as carbocation is formed quicker before I^- makes S_N2 attack (like in Q5.)

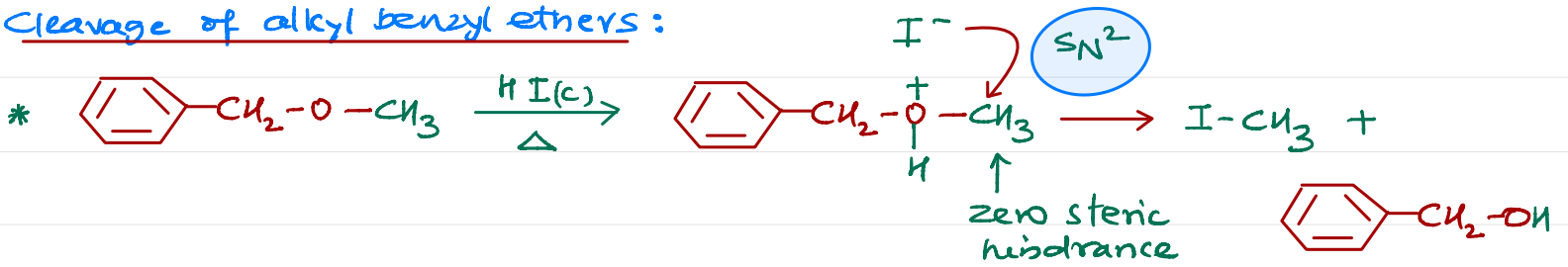
Note: We will REVISE this in SUNDAY CLASS

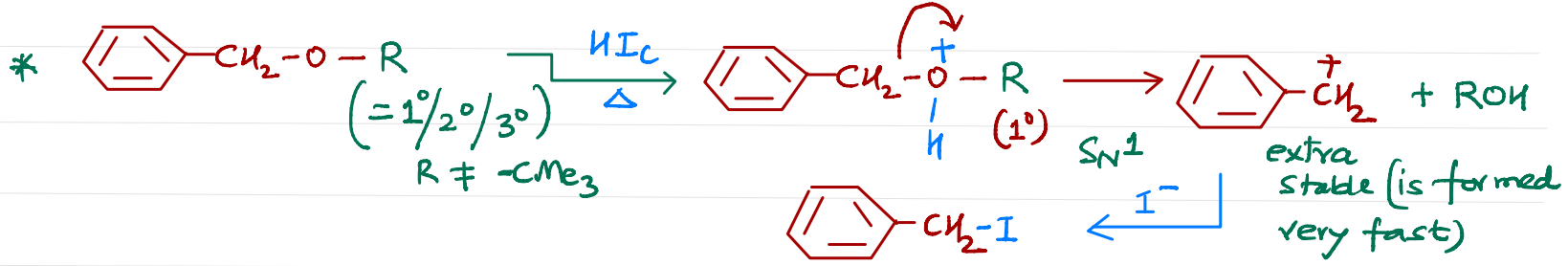
5. 

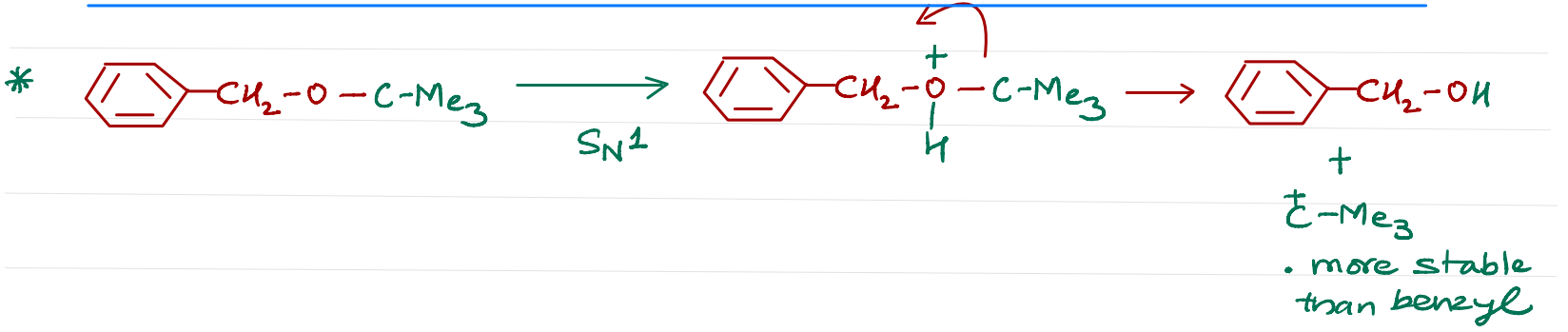

6.
HBr
−Br⁻
lp over O-atom is in conjugation with π-electrons.
Br⁻
Br
7.
Cl₂
dark
isoPr MgCl
THF
isoPr
a higher ether
HI
Δ
I
iso-Pr
HO
I⁻
SN2
1°
2°
8.
NaBH4
H2O
OH
PCC
CH2Cl2

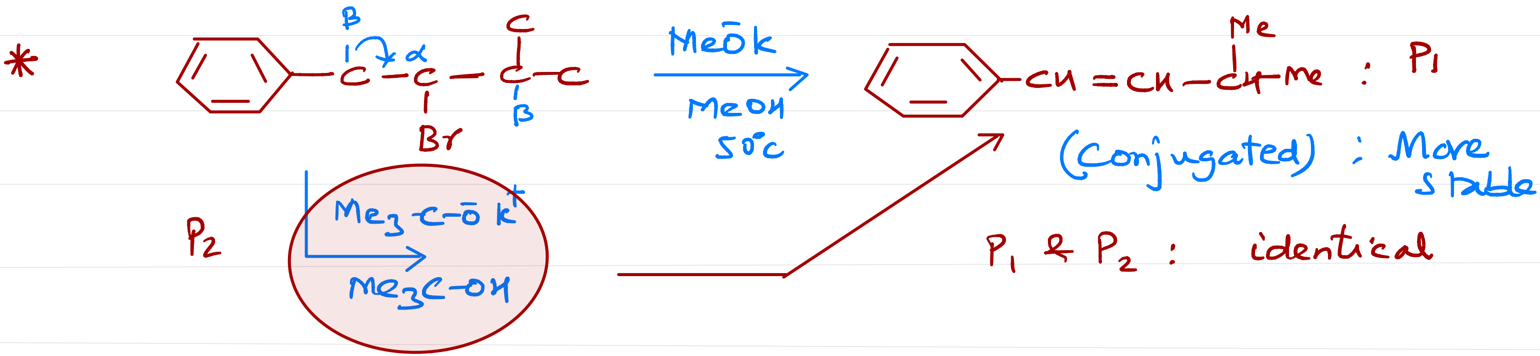

9.
Me
H
OH
Et
1. Na
2. Et-Br
O⁻ Na⁺
δ+
CH3CH2-Br
SN2
O-CH2CH3
(Retention)
1. TsCl
2. NaHS
HS⁻
OTs
NaHS
SN2
HS
(inversion)
10.
Markovnikov's
HO
HBr
(excess)
Br
H
-H2O
(I)
(5α-H)
P-1
H⁻ shift
(II)
(7α-H)
Br⁻
P-2
* Usually we should have P-1 as the product as shift from 3° → 3° is generally not visualised.
* But if there is a choice in Answer for P-2; we can then think about it.

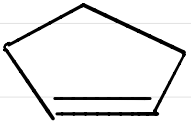
Cleavage of alkyl benzyl ethers :

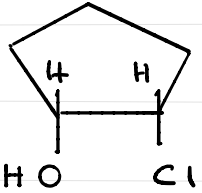




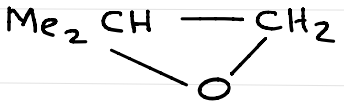


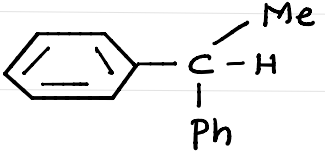

*
Br
MeO⁻K
MeOH
50°C
P1
Me
(Conjugated) : More stable
P2
Me3C–O⁻K⁺
Me3C–OH
P1 & P2 : identical

1.  $\xrightarrow[H_2O]{Cl_2}$ $\xrightarrow[base]{OH^-}$ $\xrightarrow{H^+/H_2{}^{18}O}$ A

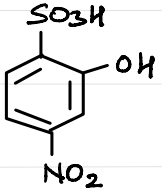
2.  $\xrightarrow[base]{OH^-}$ A $\xrightarrow[H_2O]{NaBH_4}$ $\xrightarrow{HNO_3}$ B

3. $CH_3CH_2-O-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}=CH_2 \xrightarrow{HBr}$ C + D

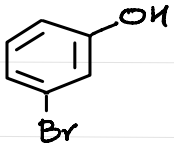
4.  $\xrightarrow{H^+/KCN}$ A $\xrightarrow{H_3O^+}$ B

5.  $\xrightarrow[h\nu]{O_2}$ A $\xrightarrow{H_3O^+}$ B + C

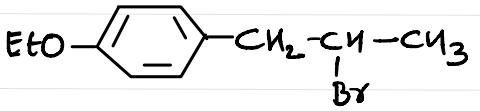
6. $PhCH=CH_2 \xrightarrow{mPcba} A \xrightarrow[Na\ (1.0\ eq)]{HC\equiv CH} B \xrightarrow{Et-Br} C \xrightarrow[\Delta]{HI\ (c)} D$

7. 

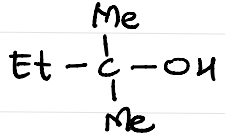
$\xrightarrow[in\ Na]{fuse} \xrightarrow{H^+} A \xrightarrow[excess]{NaH} \xrightarrow{CH_2I_2} B$

8. 

$+ \ isoPr\text{-}Br \xrightarrow{NaOH} A \xrightarrow[\Delta]{HI\ (c)} B + C$

9. 

$\xrightarrow[EtOH,\ 50^\circ C]{EtO^-Na^+} A \xrightarrow[excess]{HBr} B$

10. 

$\xrightarrow[300^\circ C]{Cu} A \xrightarrow[2.\ NaBH_4/H_2O]{1.\ Hg(OAc)_2\ |\ THF/\ MeOH} B \xrightarrow[\Delta]{HBr\ (c)} C + D$

VMC Vidyamandir Classes SINCE 1986
IIT JEE | MEDICAL | FOUNDATION

(40 - 45 Min)

Class Test - 1	Alcohol & Ethers	Chemistry

Choose correct alternative. Only one choice is correct.

1. Which of the following can be prepared by using Williamson's synthesis ?
I. Dimethyl ether **II.** Diethyl ether
III. Methyl ethyl ether **IV.** Di tert-butyl ether
The correct option is :
(A) I **(B)** I, II **(C)** I, II, III **(D)** I, II, III, IV

2. The action of HI on $(C_2H_5)_2O$ gives 2 moles of
(A) CH_3I **(B)** C_2H_5OH **(C)** C_2H_5I **(D)** Iodoform

3. The order of reactivity of halogen acids towards cleavage of Ethers is :
(A) HI > HCl > HBr **(B)** HBr > HCl > HI **(C)** HCl > HBr > HI **(D)** HI > HBr > HCl

4. CH_3CH_2I reacts with dry Ag_2O to give :
(A) Diethyl ether **(B)** Ethene **(C)** Ethanal **(D)** Ethanol

5. Which of the following reagents is best one to convert acetic acid into Ethanol ?
(A) Zn + HCl **(B)** $LiAlH_4$ **(C)** H_2 + Pt **(D)** Na + Alcohol

6. Phenol is :
(A) A base weaker than NH_3 **(B)** An acid stronger than carbonic acid
(C) An acid weaker than carbonic acid **(D)** Neutral

7. Phenol with conc. HNO_3 in presence of conc. H_2SO_4 forms
(A) o-Nitrophenol **(B)** o- and p-Nitrophenol
(C) Picric acid **(D)** p-Nitrophenol

8. Methyl alcohol on oxidation with acidified $K_2Cr_2O_7$ gives :
(A) HCOOH **(B)** CH_3CHO **(C)** CH_3COOH **(D)** $CO_2 + H_2O$

9. Primary, Secondary and Tertiary alcohols are distinguished by :
I. Lucas method **II.** Oxidation method **III.** Victor Meyer method
The correct option is :
(A) I **(B)** I, II **(C)** I, III **(D)** I, II, III

10. Conversion of Glucose to Ethyl alcohol is made by :
(A) Invertase **(B)** Zymase **(C)** Diastase **(D)** None of these

11. Dehydration of Glycerol gives :
(A) Propane **(B)** Propene **(C)** Dihydroxy acetone **(D)** Acrolein

12. Which is the most stable aldehyde ?
(A) $CH_3 - CH = CH - CHO$ **(B)** $CH_2 = CH - CH_2 - CHO$
(C) $CH_3 - \underset{\underset{CH_2}{\|}}{C} - CH_2 - CHO$ **(D)** All are equally stable

13. Which of the following alcohol(s) will produce turbidity instantly with Lucas reagent ?

I. Ethanol **II.**  **III.** tert-Butyl alcohol **IV.** Glycerol

The correct option is :

(A) I **(B)** II, III **(C)** I, II **(D)** III

14. Fermentation of sugar with yeast forms :

(A) Methanol **(B)** Ethanol **(C)** Ethanal **(D)** Acetic acid

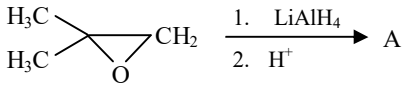
15. Which gives 1-Propanol from Propene ?

(A) Hydroboration **(B)** Oxymercuration **(C)** Demercuration **(D)** None of these

16. Alcohols are soluble in water due to the formation of

(A) Covalent bonds **(B)** Ionic bonds

(C) Hydrogen bonds with water **(D)** None of these

17.  A is :

(A) $(CH_3)_2CHCH_2OH$ **(B)** $CH_3CH_2CH_2CH_2OH$

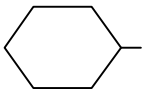
(C) $(CH_3)_3C-OH$ **(D)** No reaction

18. $CH_2=CH\underset{\underset{OH}{|}}{C}HCH_2CH_2OH \xrightarrow{MnO_2} A.$ [Hint: *MnO_2 oxidises only unsaturated alcohols*]

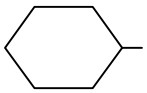
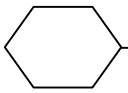
A is :

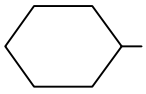
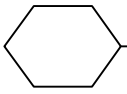
(A) $CH_2=CH\underset{\underset{O}{\|}}{C}CH_2CH_2OH$ **(B)** $CH_2=CH\underset{\underset{OH}{|}}{C}HCH_2CHO$

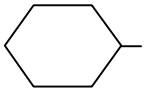
(C) $CH_2=CH\underset{\underset{O}{\|}}{C}CH_2CHO$ **(D)** $CH_2=CH\underset{\underset{O}{\|}}{C}CH_2COOH$

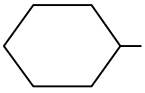
19. B $\xleftarrow{LiAlH_4}$  $\xrightarrow{H_2/Pt}$ A,

A and B are :

(A)  , 

(B)  , 

(C)  in both cases

(D)  in both cases

20. $CH_3CH=CH_2 \xrightarrow[125^\circ C,\ Pressure]{CO,\ H_2,\ [CoH(CO)_4]} \xrightarrow[Cu-Zn]{H_2}$ Product

This represents oxo method of alcohol synthesis. Product can be :

(A) $CH_3CH_2CH_2CH_2OH$ **(B)** $(CH_3)_2CHCH_2OH$

(C) Both are true **(D)** None of these