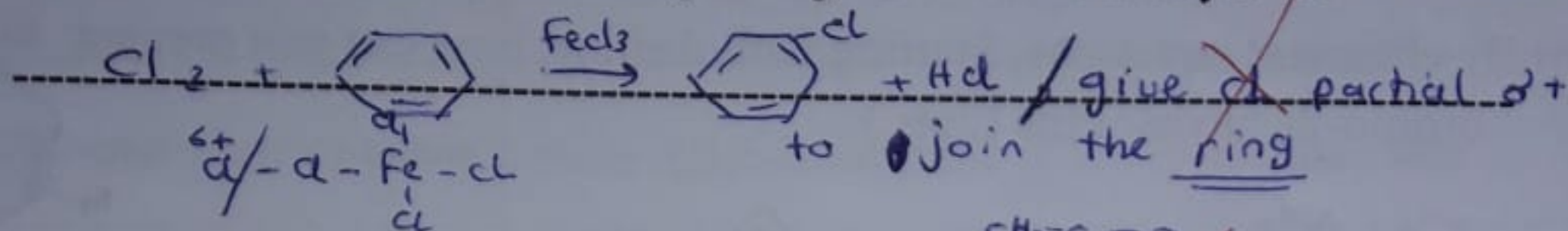
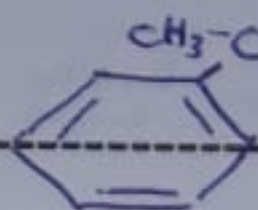
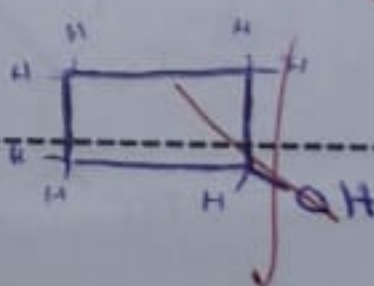
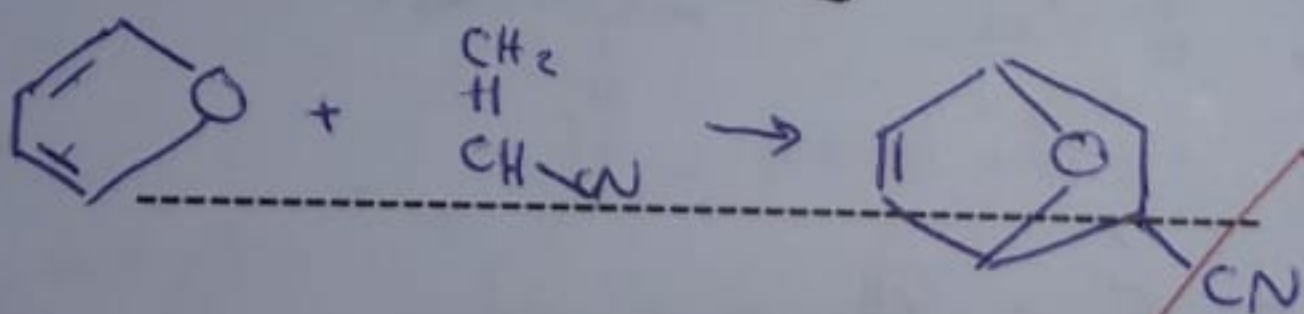
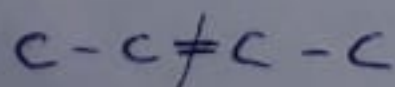
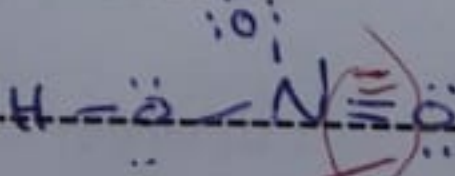


اسم الطالب/ة: محمد عيسى

6

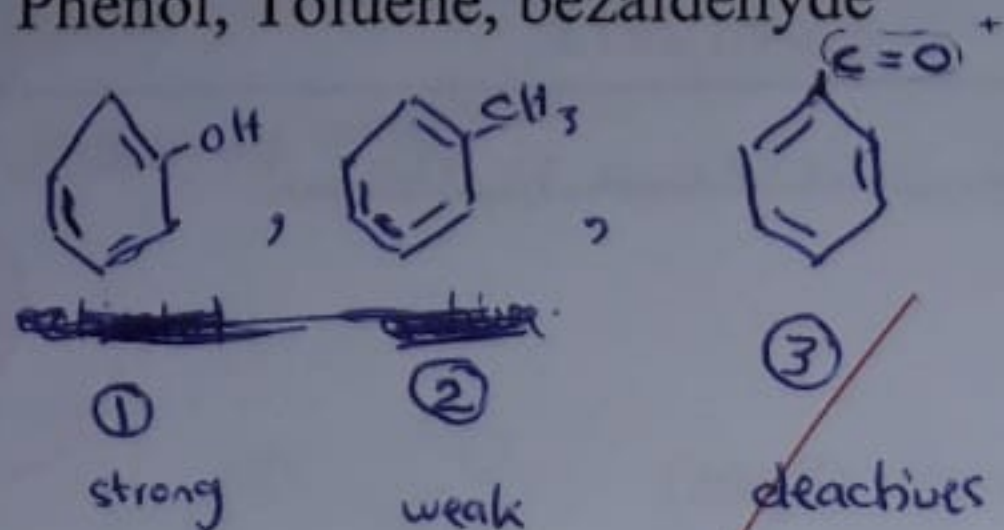
Answer the following questions:

1- Complete the following statements: (8pts.)

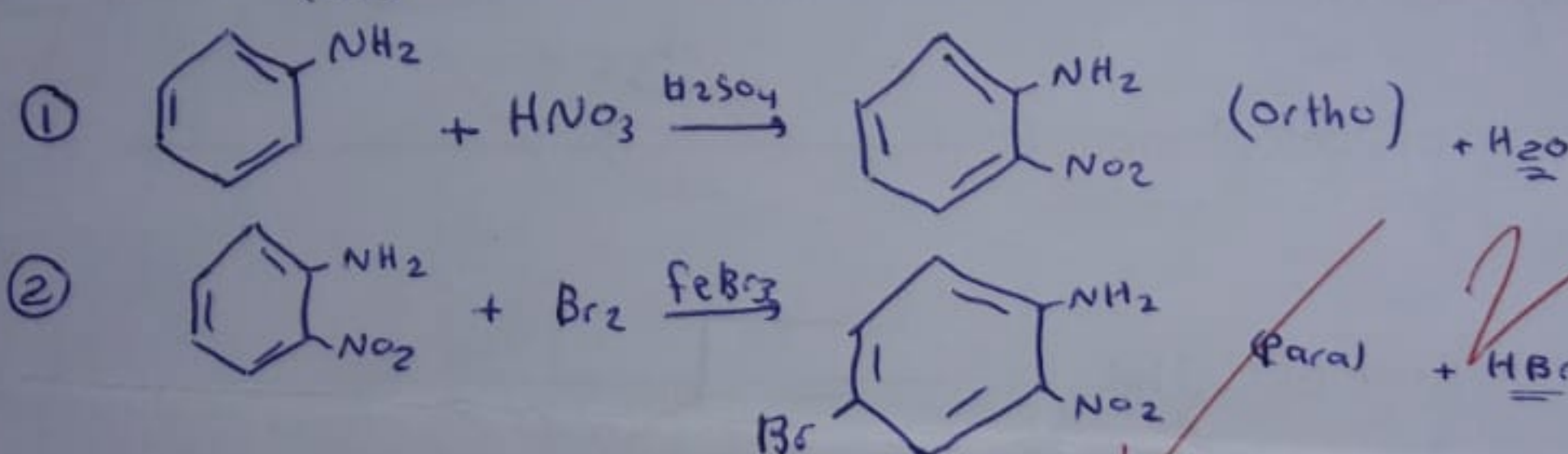
a) In the chlorination of Benzene, FeCl_3 is added as catalyst to: Add Cl_2 to itb) The structure of acetophenone is:
 $\text{CH}_3\text{---C(=O)---C}_6\text{H}_5$
c) Heterocyclic form of $\text{C}_4\text{H}_8\text{O}$ is:
 $\text{C}_4\text{H}_7\text{O}$ (cyclobutanol)
d) Cycloaddition of
 $\text{Cyclopentadiene} + \text{CH}_2 = \text{CH} - \text{CN}$
 produces
 $\text{Bicyclo[2.2.1]hept-5-ene-2-carbonitrile}$
e) The bond line formula of $(\text{CH}_3\text{CH}_2)_2\text{N}$ is
f) Lewis structure of HNO_3 is:
 $\text{H} - \text{O} - \text{N}(=\text{O})_2$
g) Ozonolysis of cis or trans 2-butene produces only
 $\text{CH}_3\text{---CH=O}$
h) CH_3OH is insoluble in octane due to its polarity and octane is non-polar (like dissolves like)polar covalent bond in OH

2- a) **Draw and arrange** the following in order of reactivity toward ring halogenation: (2pts.)

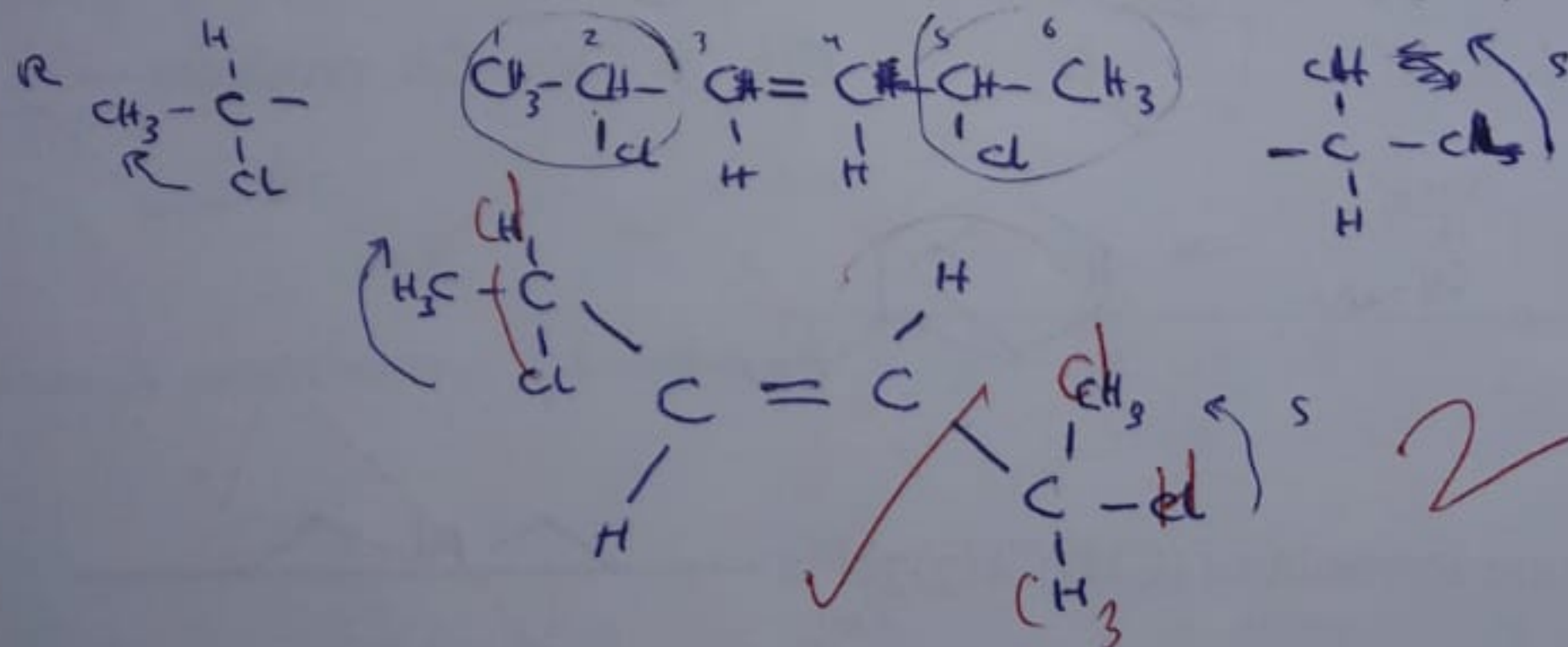
Phenol, Toluene, benzaldehyde



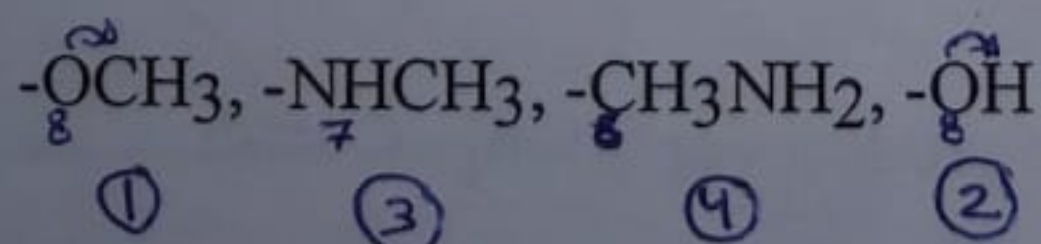
b) By chemical equations, Starting with Aniline, how can you prepare 4-bromo-2-nitroaniline (2pts.).



c) Draw the structure of: R,E,S-2,5-dichloro-3-hexene (2pts.).



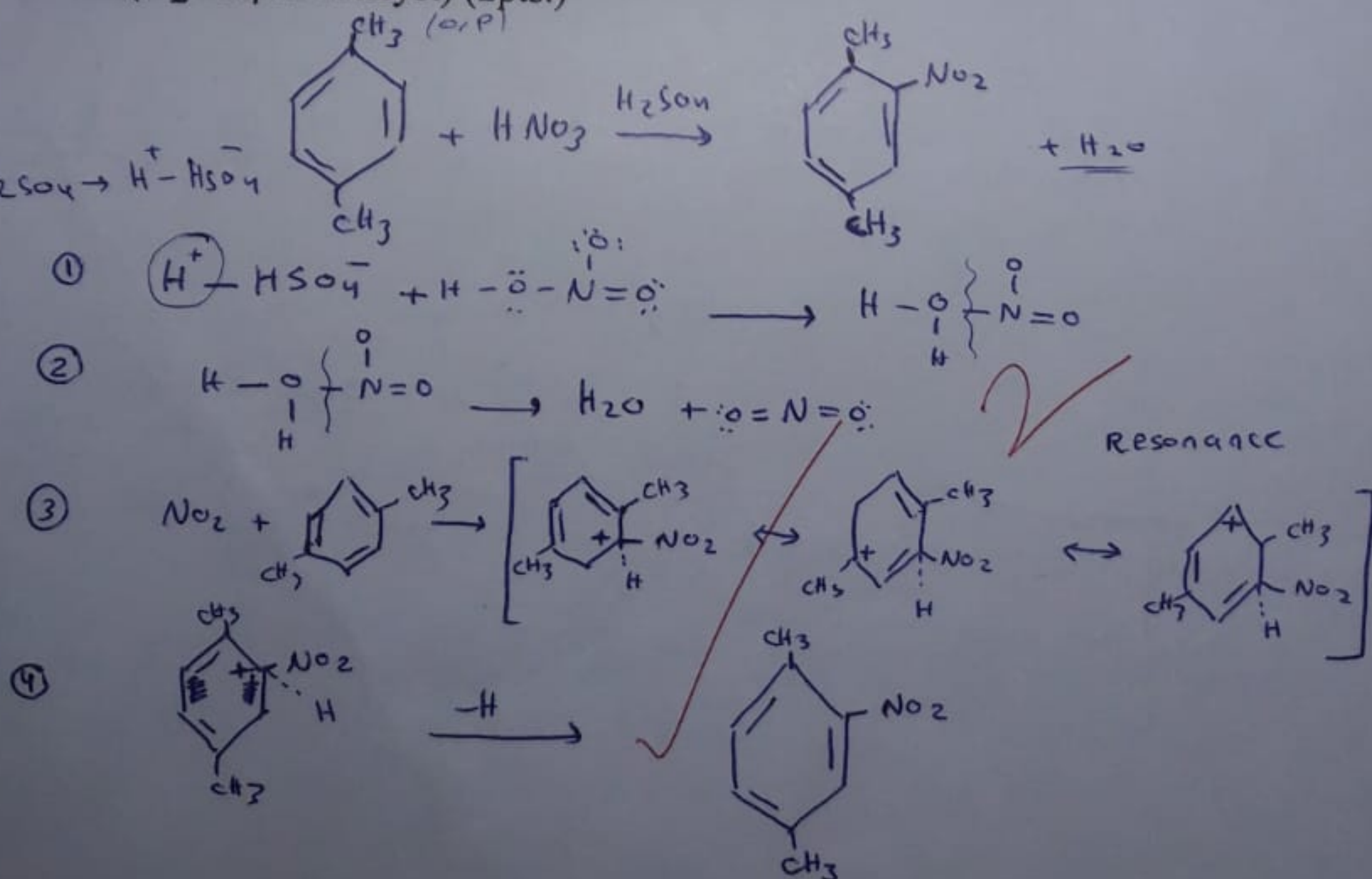
d) Arrange the following groups in order of decreasing priority to R-S configuration: (2pts.)



3- a) Name and /or draw the structures of the following compounds: (6pts.)

4-chloro-2-phenyl-butane	diphenal 1,1-diphenyl methanal	3,4-di Bromo-1,4-hexa diene
(S)-3-methyl cyclopentene	trans-1,3,5-hexatriene	p-nitroanisole

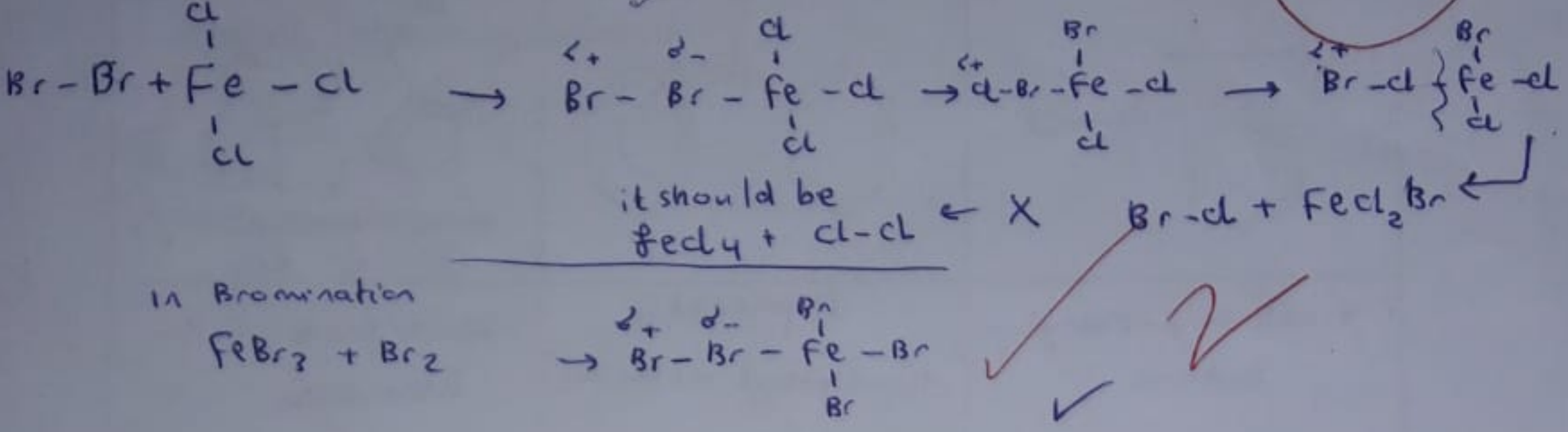
b) Write all steps in the reaction mechanism of Nitration of p-xylene (H_2SO_4 as catalyst) (2pts.)



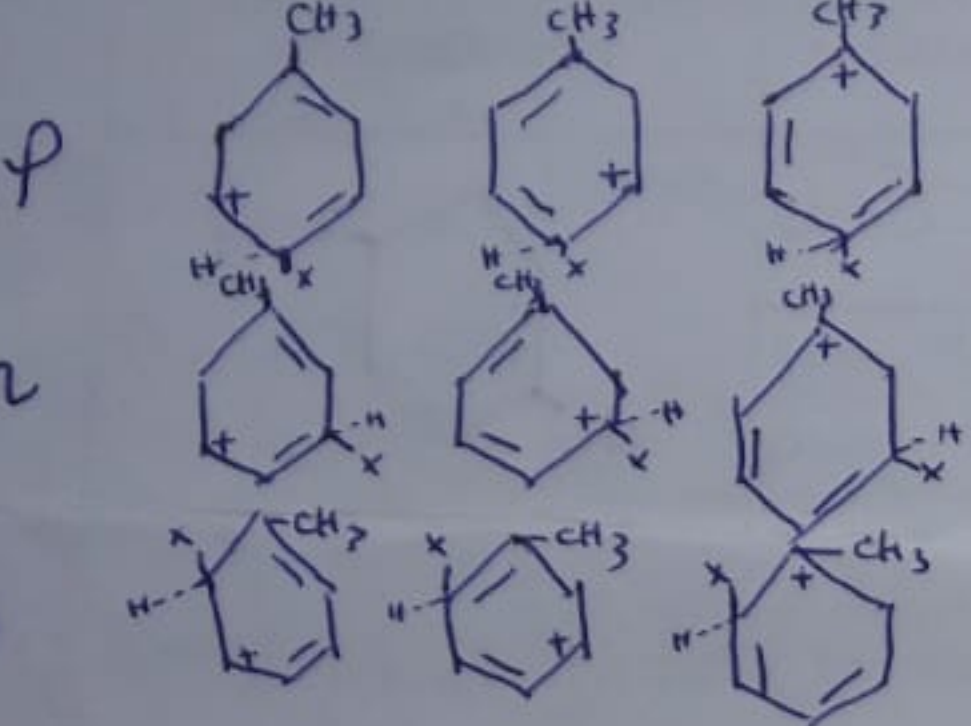
6

4- Tell why: (6pts.)

a) FeBr₃ is used for the bromination of Benzene instead of FeCl₃.



b) CH₃ activates benzene ring, while NO₂ deactivates benzene ring. X halogen

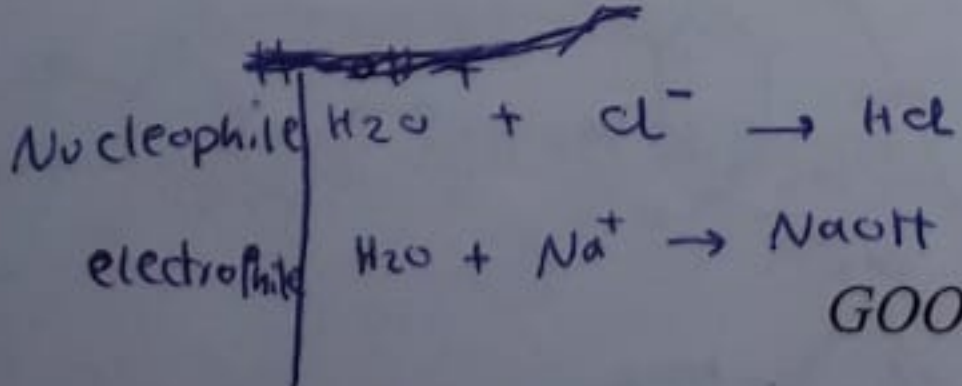
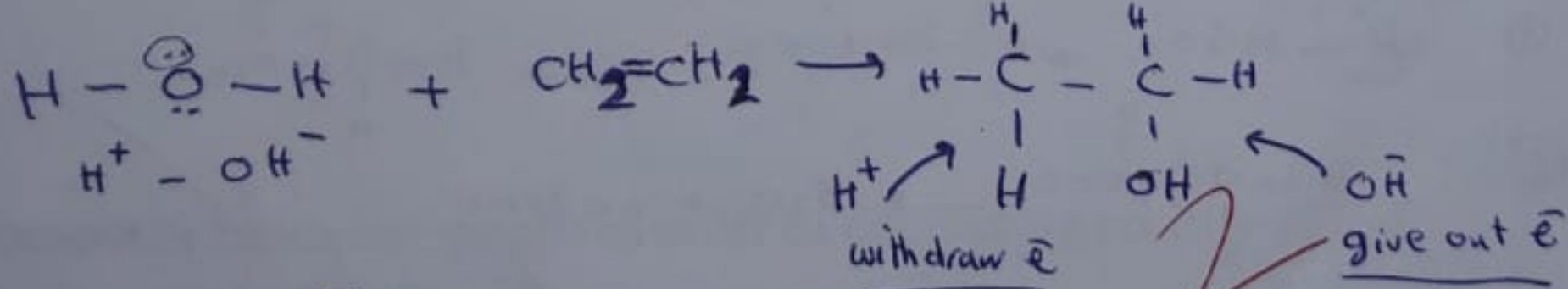


CH₃ directs to O₂P because it get direct with the carbocation while NO₂ direct m

CH₃ activates it weakly because it has a pair of unshared e⁻ & the ring is (+) so it released electrons and activated ring
 while NO₂ is (+) it withdraws electrons causing the ring to be deactivated

c) Water acts as a nucleophile or electrophile. (show by equations).

* water acts as nucleophile because it has a pair of unshared electrons on the oxygen atom, & as an electrophile because hydrogen releases proton & owns an empty orbital



GOOD LUCK

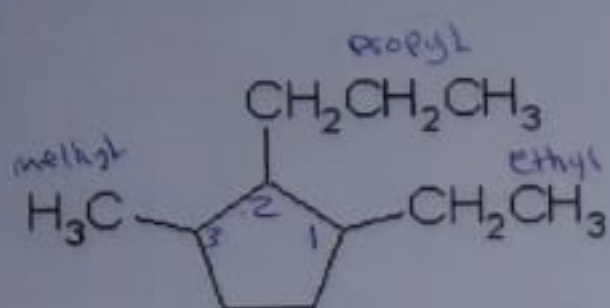
Al-Azhar University-GAZA
Organic Chemistry for Dentistry

QUIZ, Oct., 22, 2018 (A)

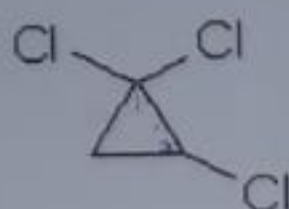
a.5

اسم الطالب/ة: الشعبة: 1

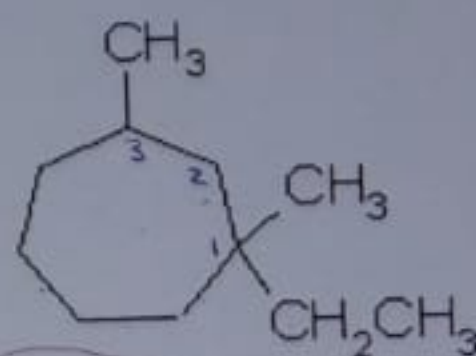
Give the IUPAC names for the following compounds:



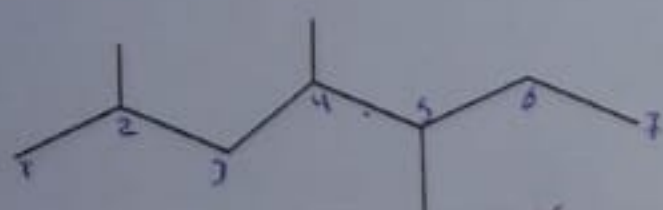
1-ethyl-3-methyl-2-propylcyclopentane



1,1,2-Trichlorocyclopropane



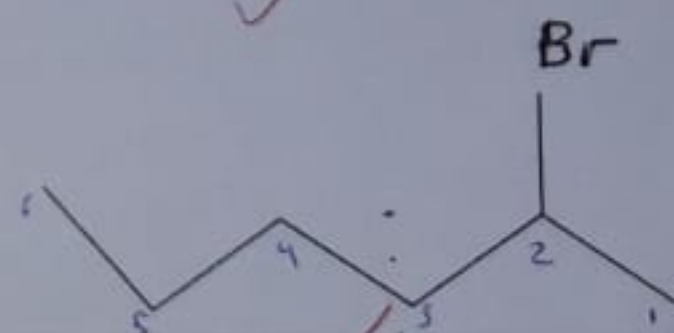
1,3-dimethyl-1-ethylcycloheptane



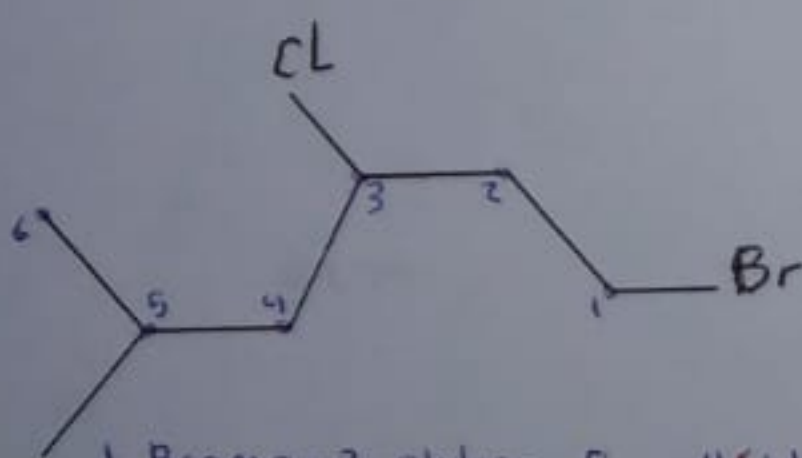
2,4,5-Trimethylheptane



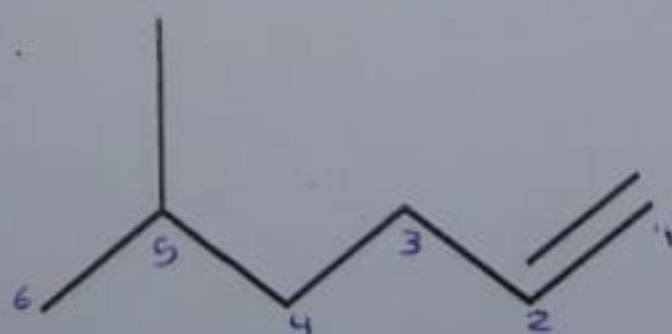
2,3,4,5,6-Pentamethylheptane



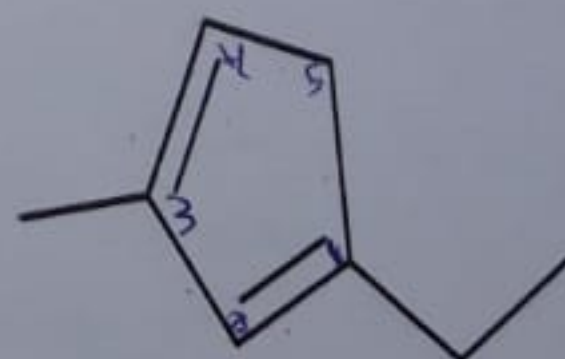
2-Bromohexane



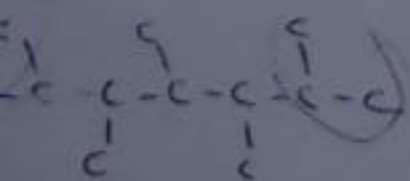
1-Bromo-3-chloro-5-methylhexane



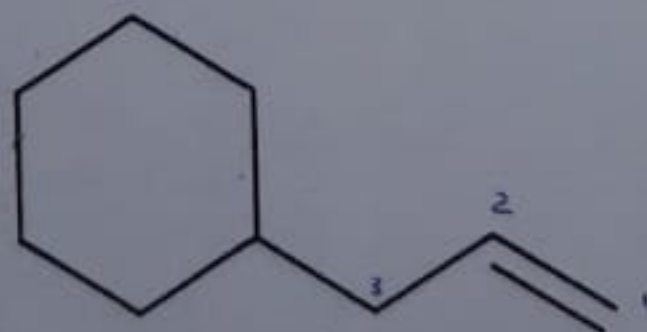
5-methyl-1-hexene



1-ethyl-3-methyl-1,3-cyclopentadiene



1-Propylene cyclohexane
propene cyclohexane



GOOD LUCK

Prof. Dr. Omar Melad

Al-Azhar University-Gaza

Chemistry Department

Prof. Dr. Omar Melad

Organic Chemistry for Medicine

1st Mid-Term Exam.

March, 26, 2018

20170127

اسم الطالب/ة

Answer the following questions:

1- Complete the following statements: (10pts.)

a) Lewis structure of H_2O_2 is $H-O-O-H$

① $2 + 2 \times 8 = 14$

② $4 + 16 = 20$

③ $20 - 14 = 6$

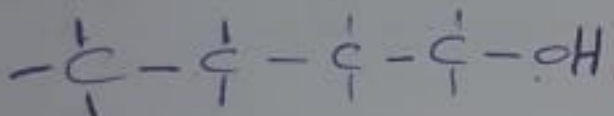
b) Hexane is soluble in octane due to ① organic compound ② non polar

c) Halogenation reaction occurs via free radical reaction mechanism.

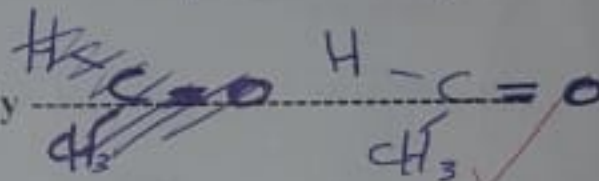
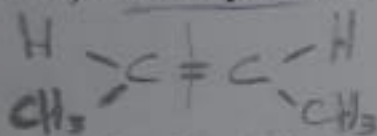
initiation
propagation
termination

Halogenation
substituent

d) An alcohol $C_4H_{10}O$, its structural formula is:



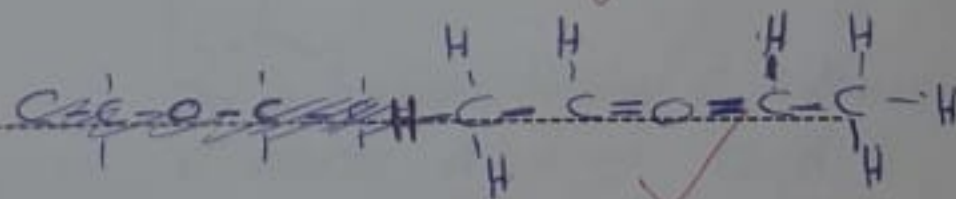
e) Ozonolysis of cis or trans 2-butene produces only



f) The bond line formula of $(CH_3CH_2)_2N$ is



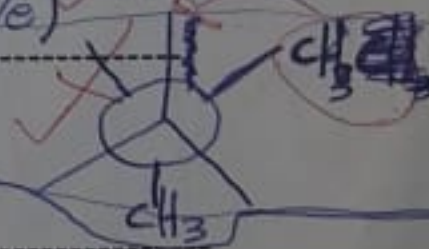
g) Acyclic form of C_4H_8O is



h) Water can act as electrophile or as nucleophile due to ① It has a spare for receiving e^- (electrophile)

② has two unshared e^- (nucleophile)

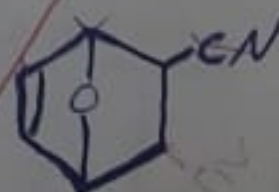
i) Newman projection of staggered conformation of butane is



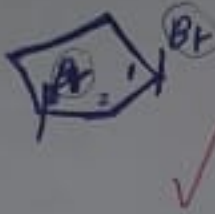
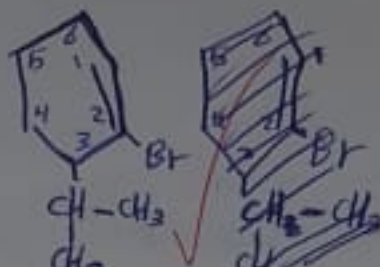
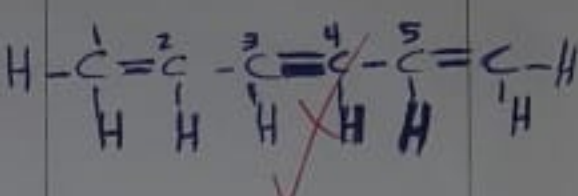
j) Cycloaddition of



+ $CH_2=CH-CN$ produces

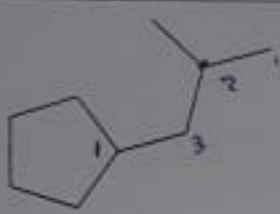
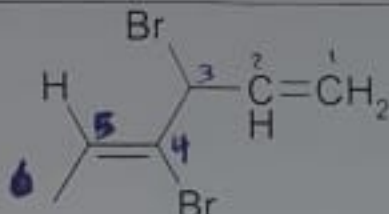
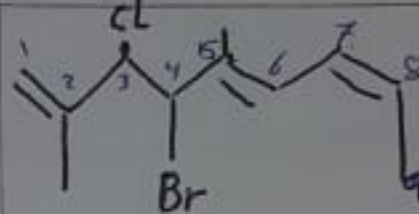


2- a) Draw the structure of the following compounds: (3pts.)

Cis -1,3-dibromocyclopentane	2-bromo-3-isopropylcyclohexene	trans-1,3,5-hexatriene
		

2.5

b) Name the following compounds (IUPAC names): (3pts.)

		
1-isobutylcyclopentane 2-methyl-3-cyclopentylpropane Propane	3,4-dibromo-1,4-hexadiene	4-bromo-3-chloro-2,5-dimethyl-1,5,7-nonaene 4-bromo-3-chloro-2,5-dimethyl-1,5,7-nonaene

2.5

3- a) Which of the following compounds has higher boiling point? Why? (2pts.)



This is higher because it contains OH which it makes a hydrogen bond.

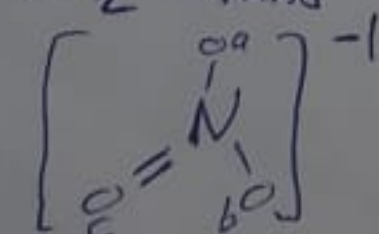
b) What is the formal charge on each atom on NO_3^- ? What is the different resonance structures (Draw the structures). (2pts.)

Lewis of structure :-

$$1) 6 + 3 \times 6 + 1 = 24$$

$$2) (8 \times 4) - 24 = 8$$

$$3) \frac{8}{2} = 4 \text{ bond}$$



formal charge :-

$$N = 5 - \frac{1}{2} \times 8 = +1$$

$$O_a = 6 - \frac{1}{2} \times 2 - 6 = -1$$

$$O_b = -1$$

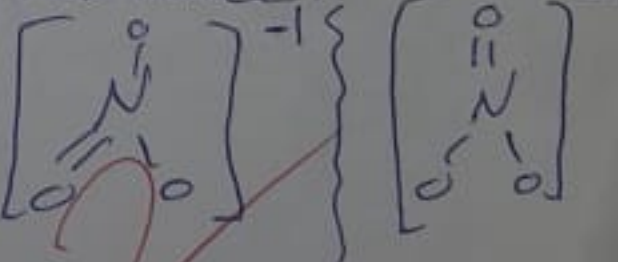
$$O_c = 6 - \frac{1}{2} \times 4 - 4 = 0$$

Total formal charge

$$+1 - 1 - 1 = -1$$

2

Resonance :-



GOOD Luck



18.5/20

28/30

بسم الله الرحمن الرحيم

Al-Azhar University-Gaza

Organic Chemistry for Medicine

Chemistry Department

2nd Mid-Term Exam.

Prof. Dr. Omar Melad

(C)

26/4/2018

اسم الطالب/ة باللغة العربية

Answer the following questions:

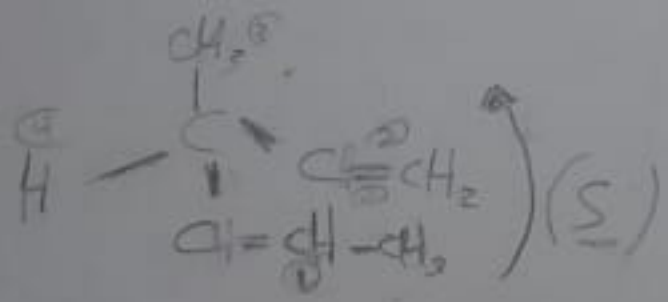
Q1) Which of the following scientific statements are true and which are false? (6pts.)

- 1- [T] Conformation means rotation about single bond *substrate*
- 2- [F] In S_N1 reaction, Rate depends on nucleophile concentration.
- 3- [T] In acid dehydration of 2-methyl-2-butanol, the major product is 2-methyl-2-butene. *tert*
- 4- [F] Rate of formation of carbocations follow the order 3° > 2° > 1° > CH₃⁺ *Primary*
- 5- [T] E1 describes an elimination reaction in which the rate-determining step does not involve the base.
- 6- [F] Mixture of equal parts of enantiomers is called stereogenic center.

3+1

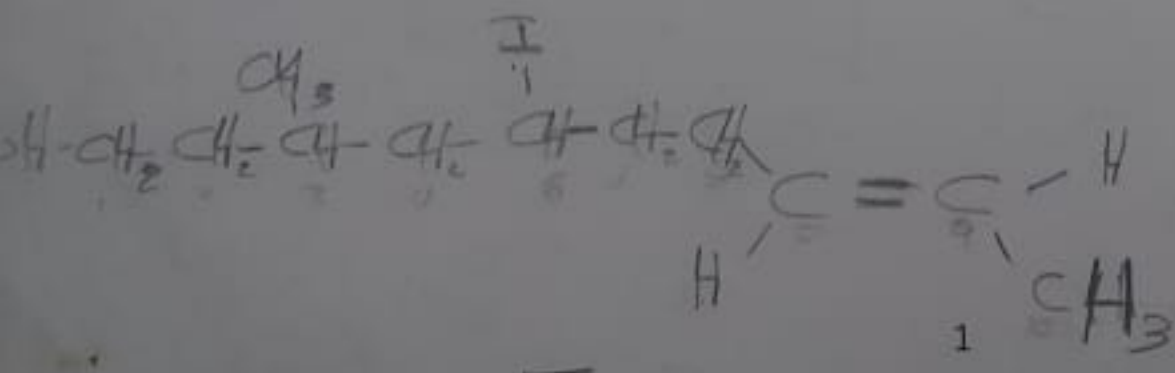
Q2) Draw the following: (4pts.)

a) (S) -3-methyl-1,4- hexadiene



S-3-methyl-1,4-hexadiene

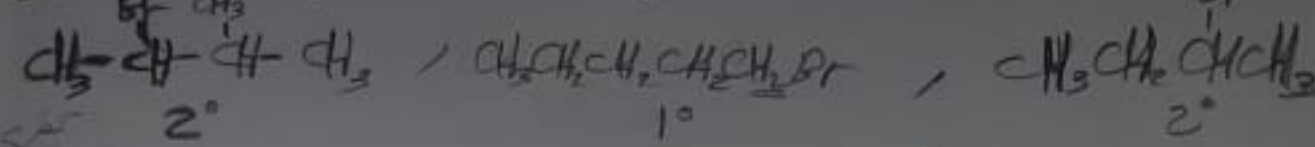
b) (E)- 5-iodo-3-methyldec-8-ene-1-ol



E-5-iodo-3-methyldec-8-ene-1-ol

Q3) a) Arrange in order of reactivity toward dehydrohalogenation? (2pts.)

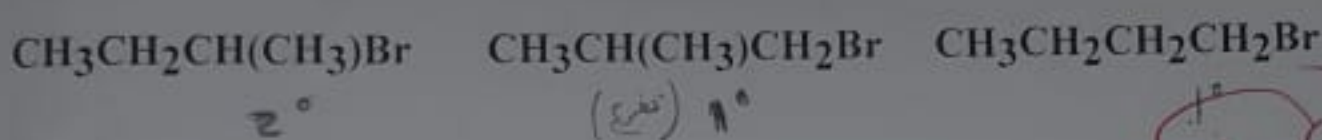
2-bromo-3-methylbutane, 1-bromopentane, 3-bromopentane



According E_1 : 1 3 2

According E_2 : 3 1 2

b) Arrange the following compounds in order of decreasing S_N1 ? (2pts.) $3^\circ > 2^\circ > 1^\circ > \text{CH}_3\text{Br}$

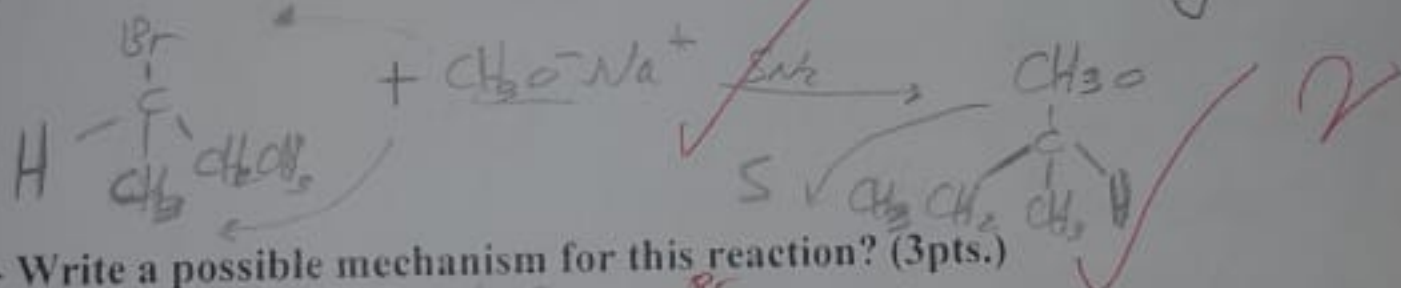
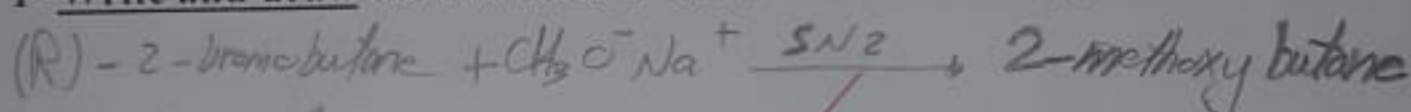


S_N1 "rule": 1 2 3

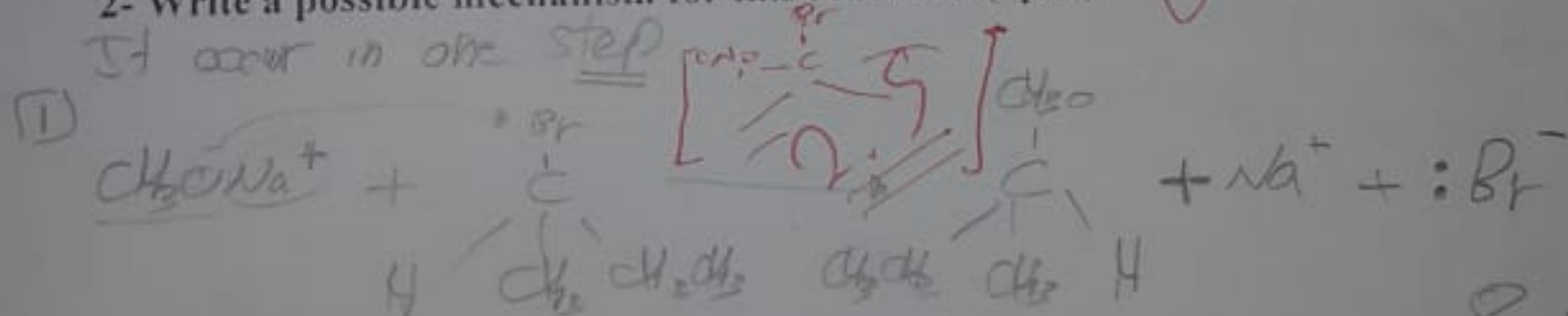


Q4) a) If (R) -2-bromobutane reacts with CH_3ONa (strong nucleophile):

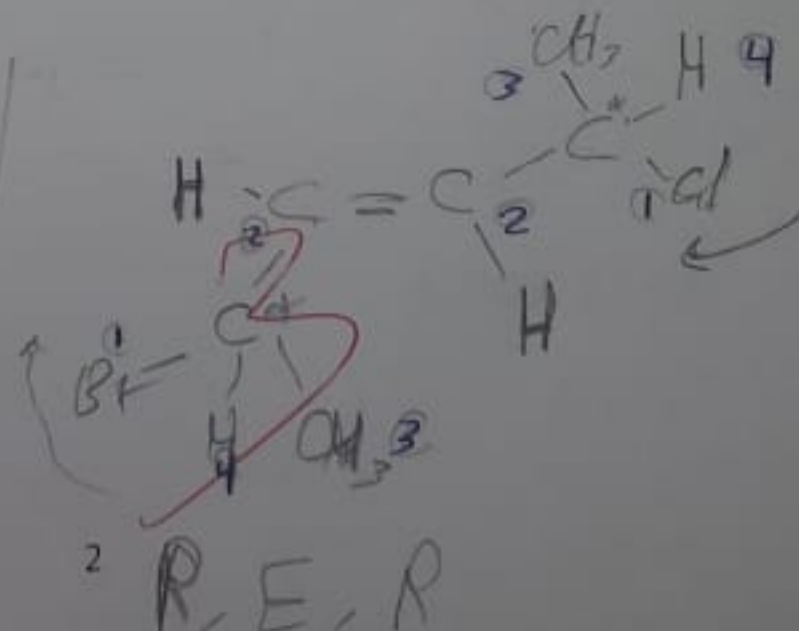
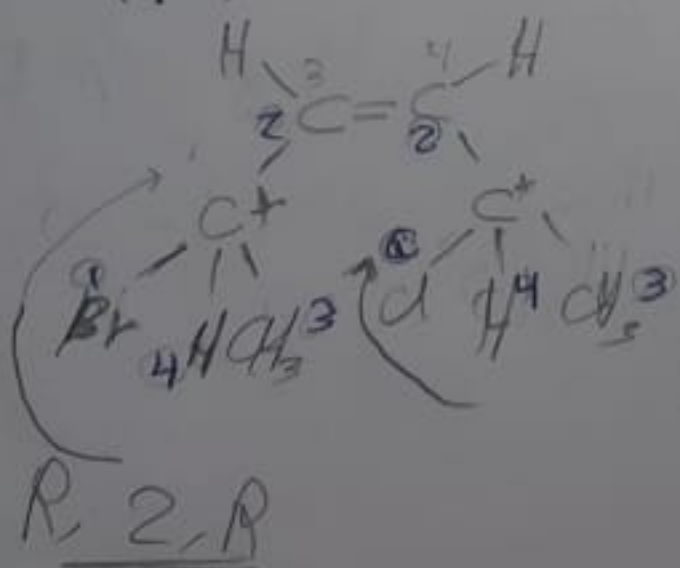
1- Write and draw the two sides of the above reaction? (2pts.)



2- Write a possible mechanism for this reaction? (3pts.)



3- Draw all the possible stereoisomerism for: 2-bromo-5-chloro-3-hexene (3pts.)



8 isomers

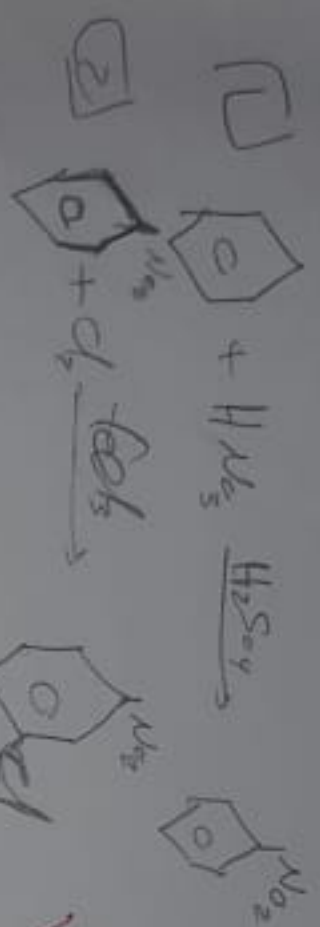
R, E, R
 R, E, S
 R, Z, R
 R, Z, S
 S, E, S
 S, E, R
 S, Z, S
 S, Z, R

Q5) Which compound is more reactive toward electrophilic substitution: (2pts.)

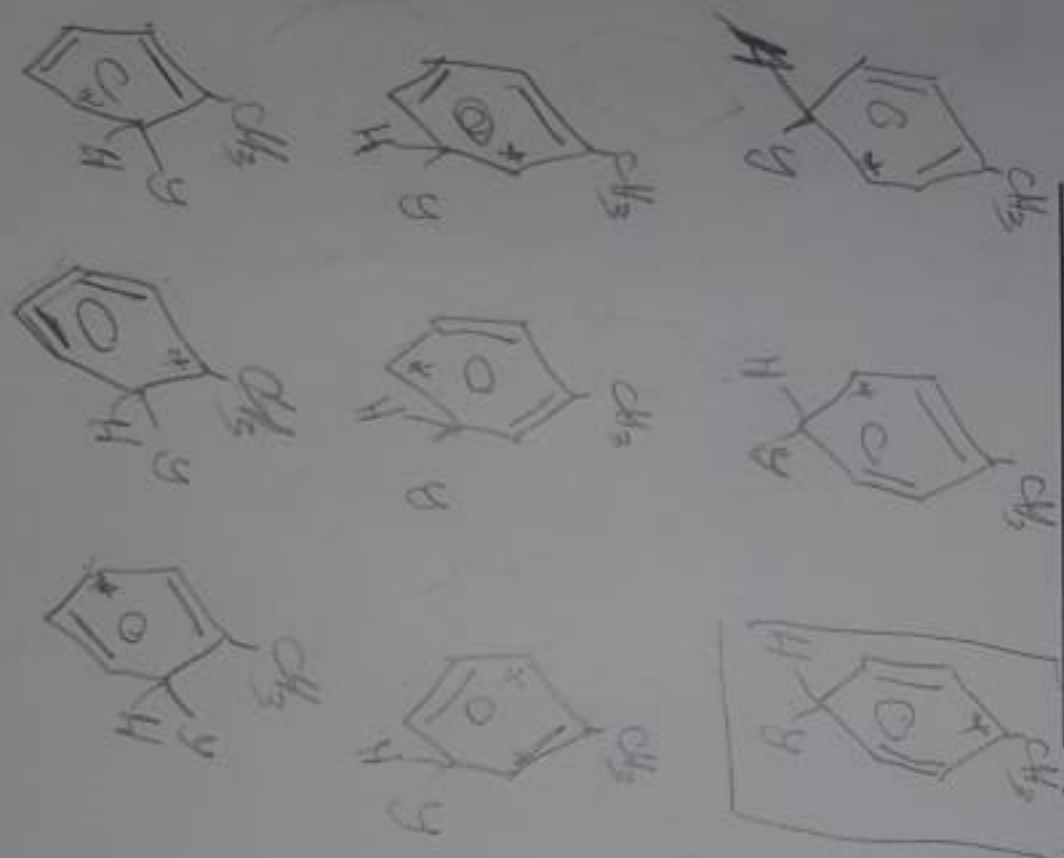
Chlorobenzene or ethyl benzene



More reactive because it's able to release e^- which stabilizes carbocation and make it activated.



c) Methyl is activated group and ortho and para directing. Explain using carbocation intermediate. (4pts.)



methyl is activated group because there are connection between methyl group and carbocation in ortho and para which make it release e^- , thus stabilize benzene ring as a result activated benzene

GOOD LUCK

Al-Azhar University-Gaza

Organic Chemistry for Dentistry

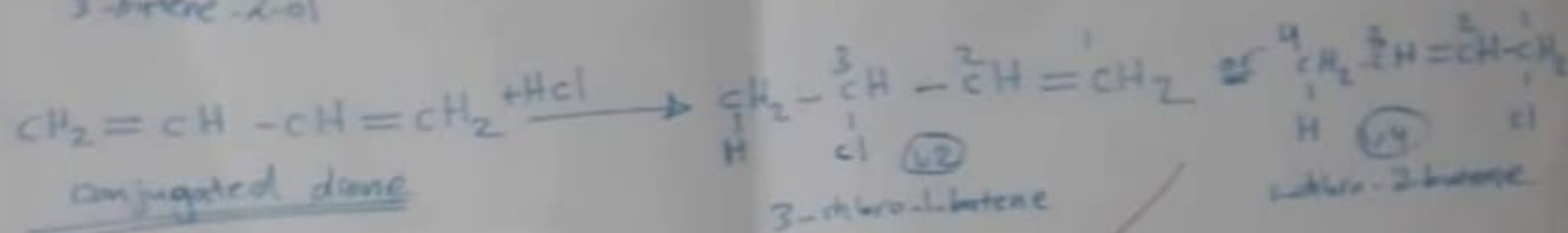
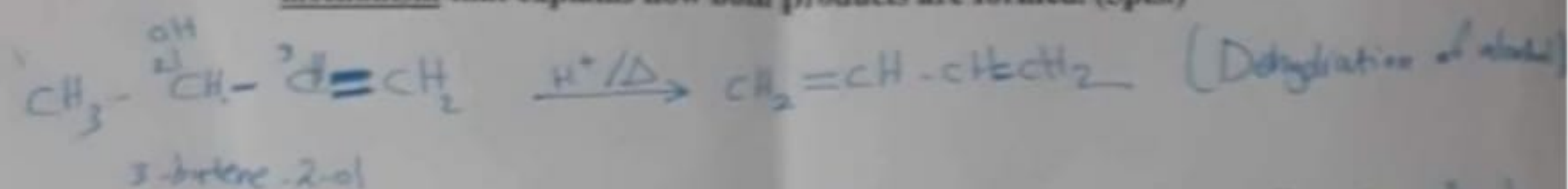
Chemistry Department

2nd Mid-Term Exam.

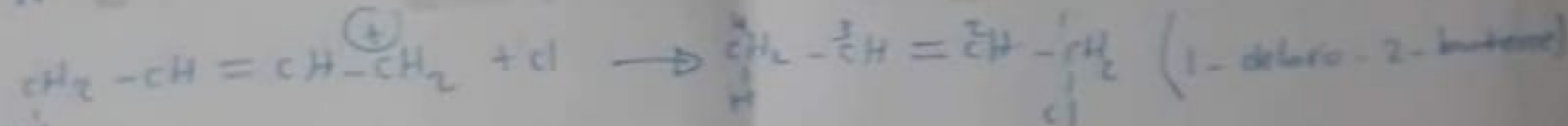
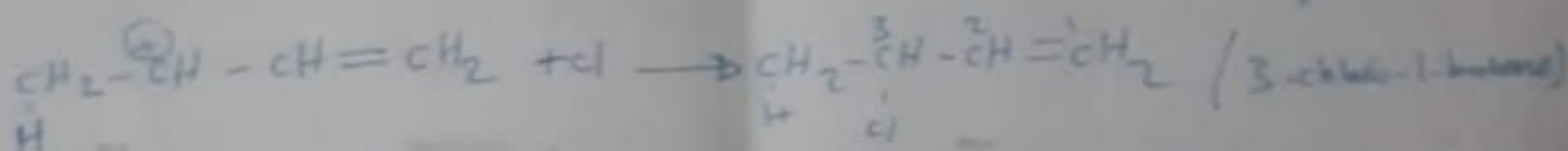
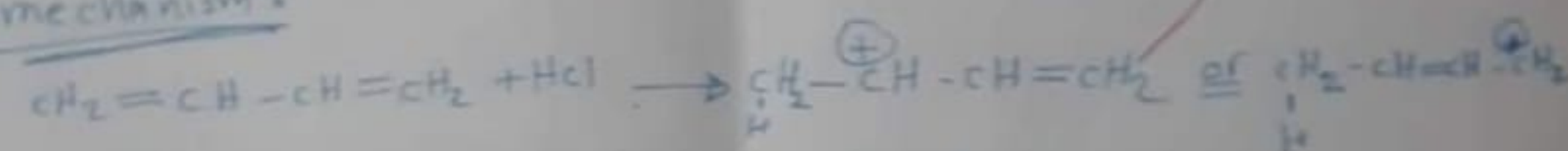
Prof. Dr. Omar Khader Melad (2B) 17/12/2018

اسم الطالب / ف. الشعبة:

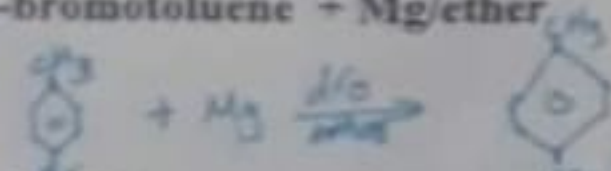
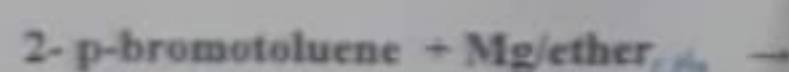
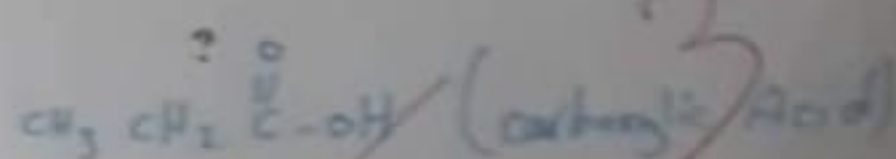
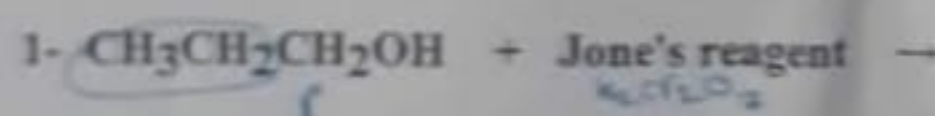
Q1) Treatment of 3-butene-2-ol with concentrated HCl gives a mixture of two products, 3-chloro-1-butene and 1-chloro-2-butene. Write a reaction mechanism that explains how both products are formed. (5pts.)



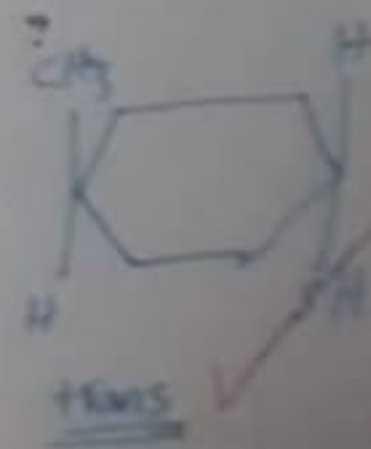
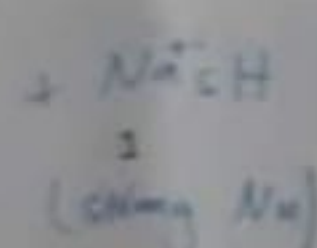
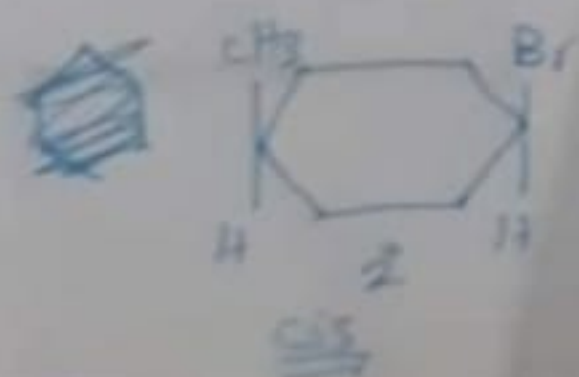
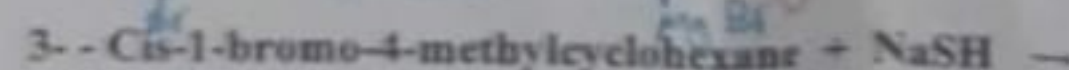
* mechanism:



Q2) Complete and draw each of the following equations: (3pts.)

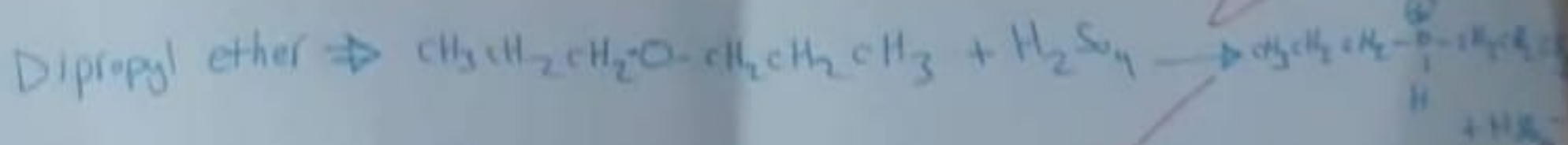


(Grignard reagent) (alkyl or aryl-magnesium halide)



Q5) a) By chemical test, how can you distinguish between (Draw their structures): (2pts.)

Dipropyl ether and hexane

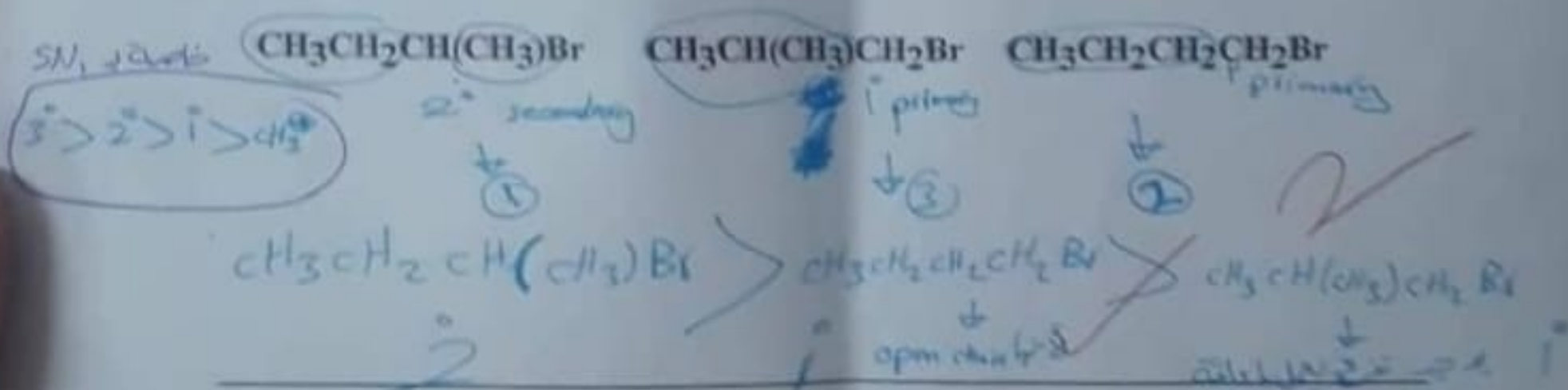


b) Arrange the following in order of decreasing solubility in water (2pts.)

Hexanol, ethyl chloride, heptanol

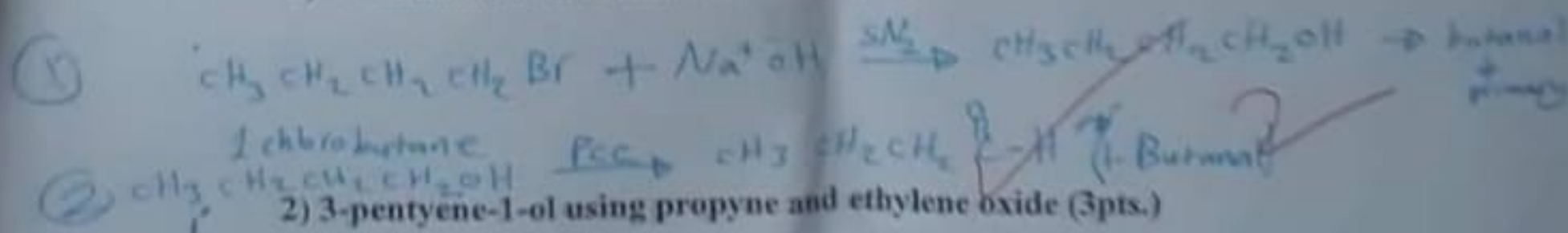
Hexanol > heptanol > ethyl chloride
 because it has longer hydrophobic carbon chain

c) Arrange the following compounds in order of decreasing $\text{S}_\text{N}1$? (2pts.)

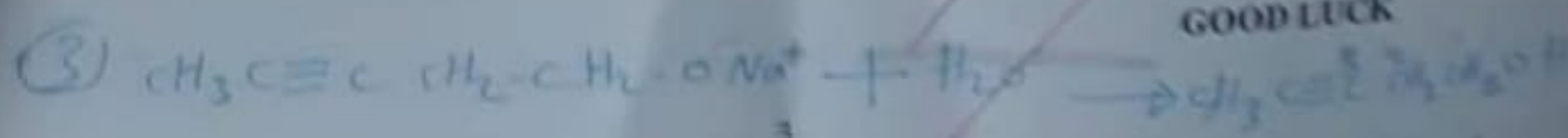
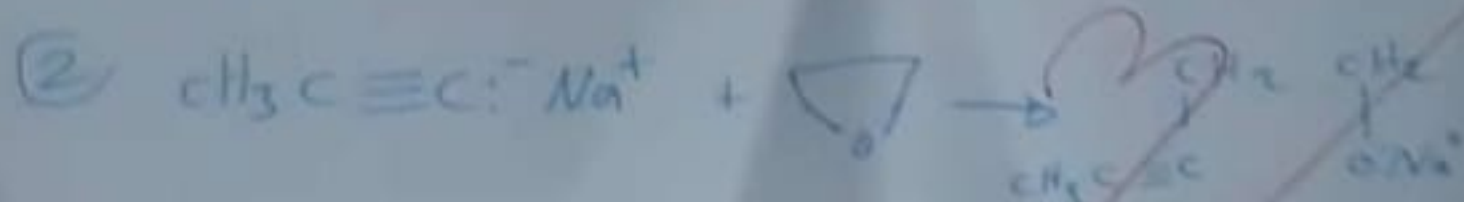
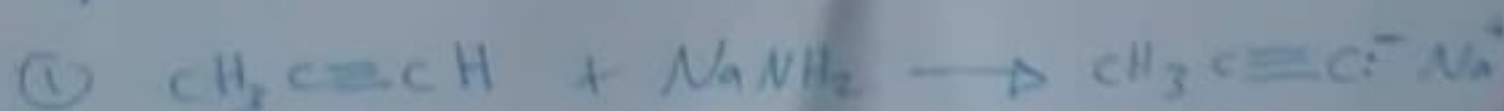


Q6) Using chemical equations, show how can you prepare:

1) 1-Butanal from 1-chlorobutane (2pts.)



2) 3-pentyne-1-ol using propyne and ethylene oxide (3pts.)



GOOD LUCK

#Ugh1203

Q3) Name and/or draw the structures of the following compounds (6pts.)

2,4 hexadien-1-ol ✓	cyclohexene oxide ✓
Ethylene glycol diethyl ether	
$\text{CH}_3\text{CH}_2\text{O}-\text{CH}_2-\text{CH}_2-\text{OCH}_2\text{CH}_3$ ✓	2-cyclohexanol ✓
2-ethoxy ethanol	(S)-2-butenthiol

Q4) Which of the following scientific statements are true and which are false? (5pts.)

1- [] E1 describes an elimination reaction in which the rate-determining step does not involve the base. ✓

2- [] Rate of formation of carbocations follow the order $3^\circ > 2^\circ > 1^\circ > \text{CH}_3^\circ$ ✓

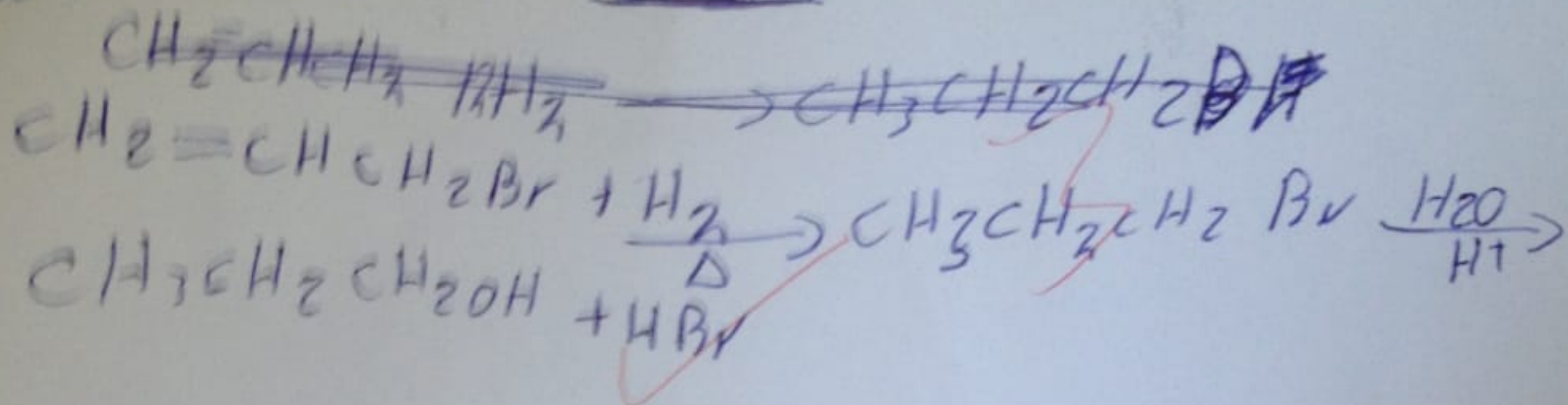
3- [] Cyclohexanol is oxidized to ketone using Jones's reagent. ✓

4- [] Symmetric ethers are generally synthesized by dehydration of alcohols. ✓

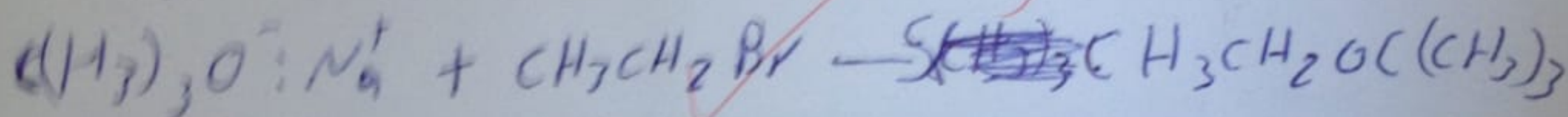
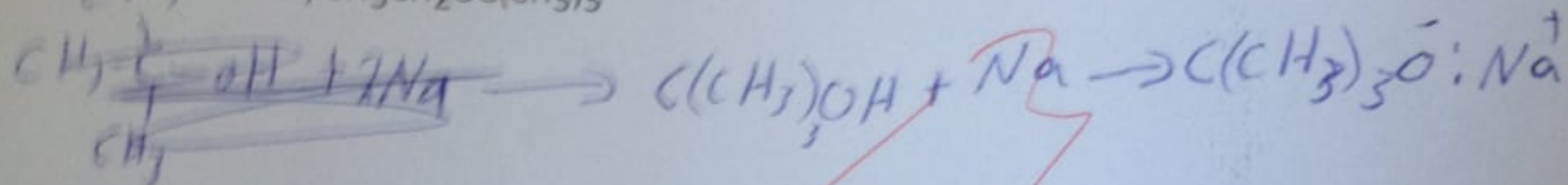
5- [] The $\text{S}_\text{N}2$ reaction occurs with inversion of configuration. ✓

2- By chemical equations, show how can you prepare the following:

a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ from $\text{CH}_2=\text{CHCH}_2\text{Br}$

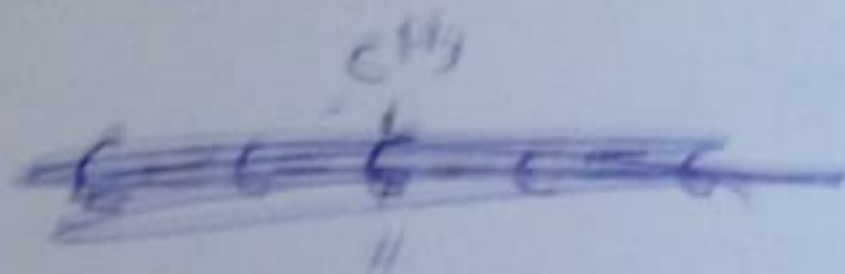


b) $\text{CH}_3\text{CH}_2\text{OC}(\text{CH}_3)_3$

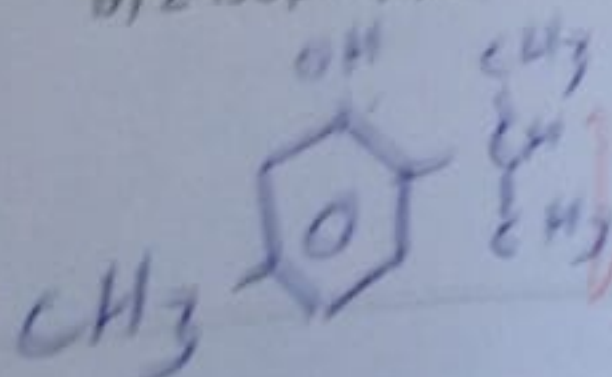


3- Draw the following:

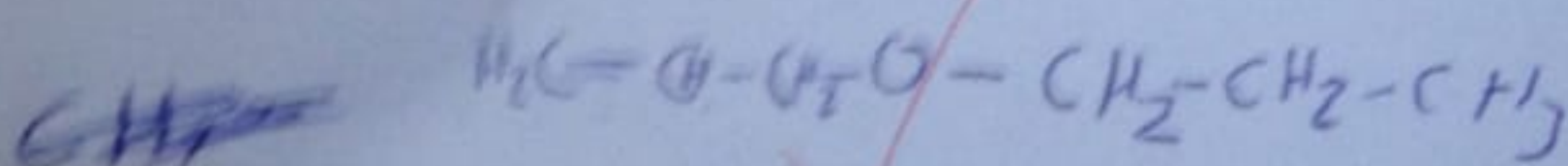
a) (S)-2-methyl-1,4-pentadiene



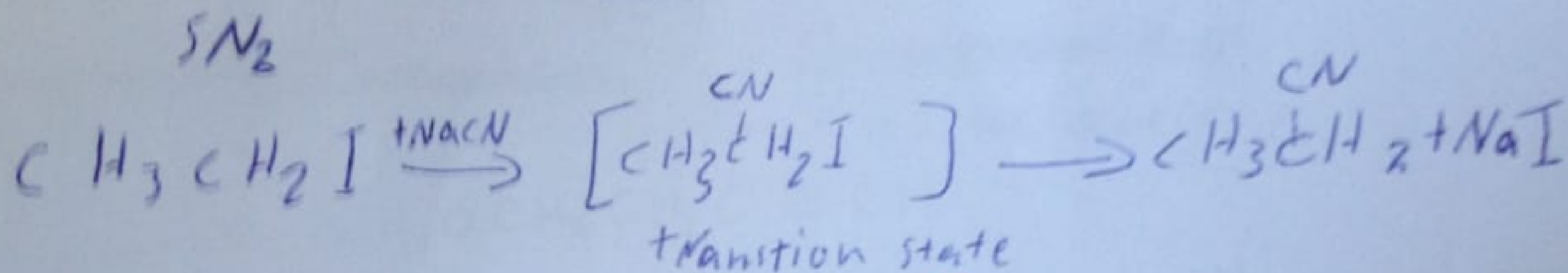
b) 2-isopropyl-5-methyl phenol



c) allyl propyl ether

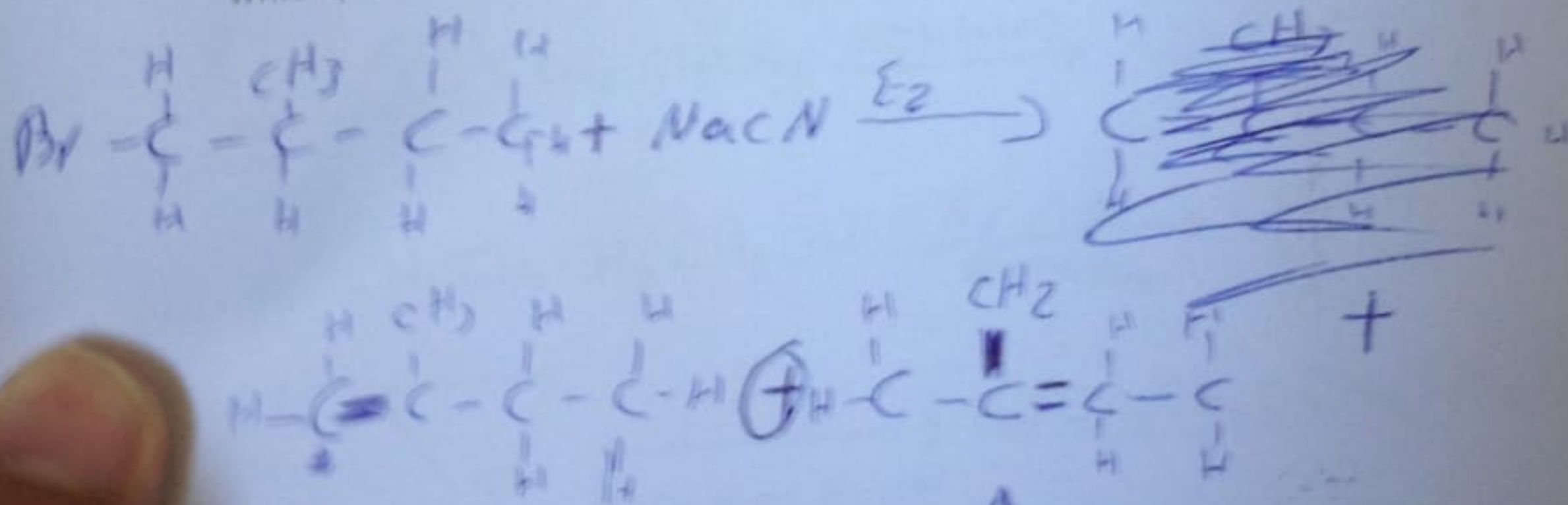


4) a) Write the suitable mechanism for the following reaction:



1 step

b) Give the structure of all the possible products (if any) when 1-bromo-2-methyl butane react by E2 mechanism, show the mechanism and tell which product is preferred and why?



2

is preferred

it is preferred because it make ~~the~~ more methyl groups around double bond

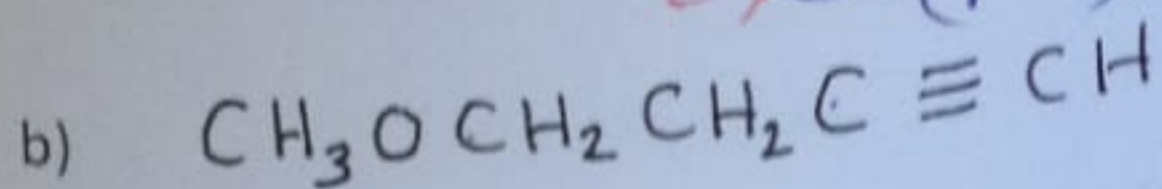
5) Name the following using IUPAC rules:

a)



using E-Z

~~(Z, Z)-hexa-2,4-diene~~
~~Z-hexa-2,4-diene~~
 2, Z (1,4) hexa-2,4-diene



4-methoxybutyne

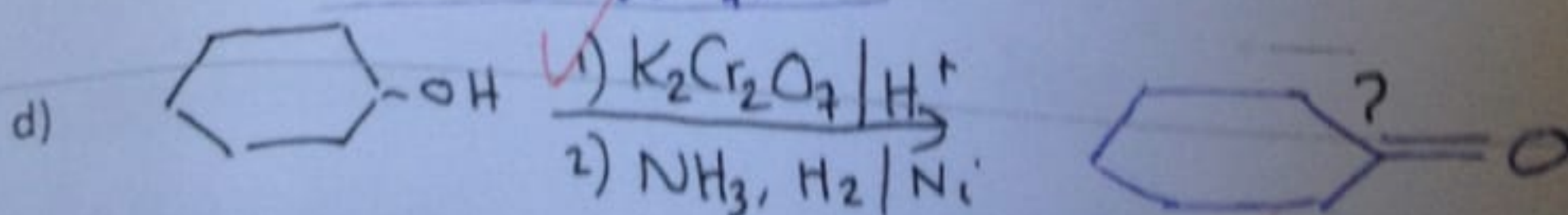
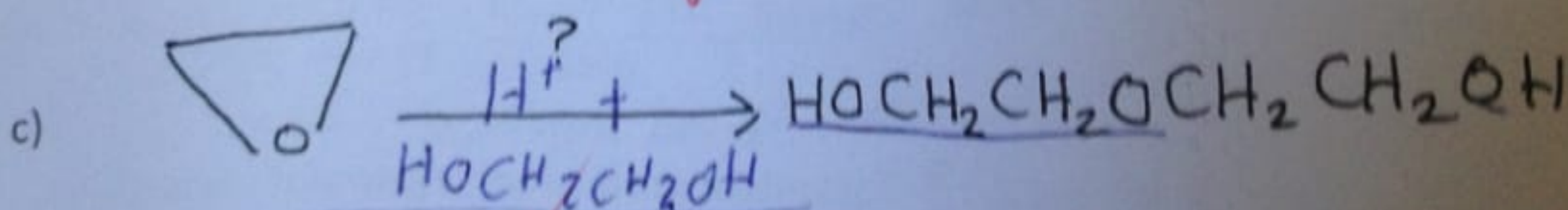
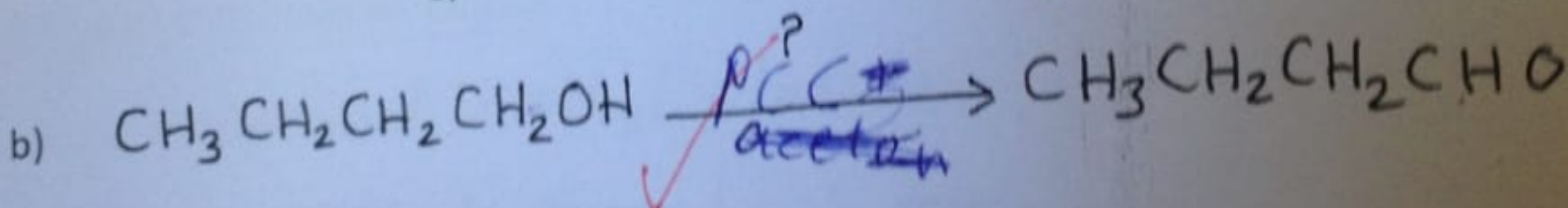
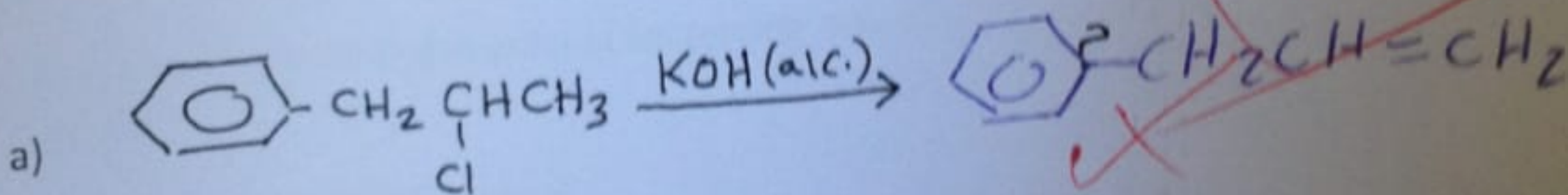
c)



$\text{CH}(\text{OH})\text{CH}_3$ using R-S

R ~~3-ethanolcyclopentene~~

6- Complete the following equations:

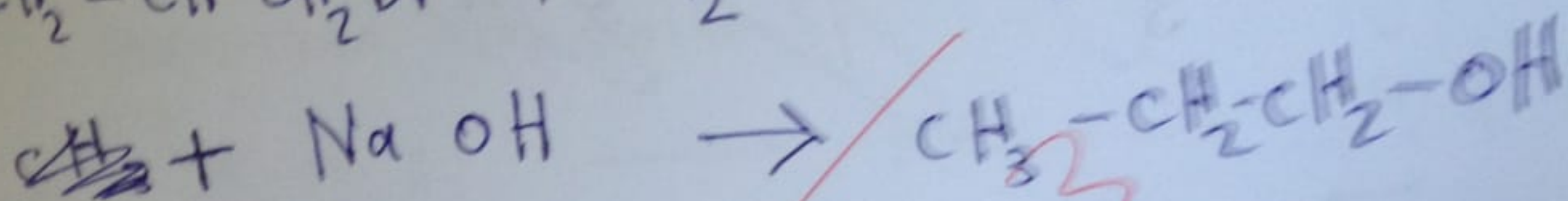
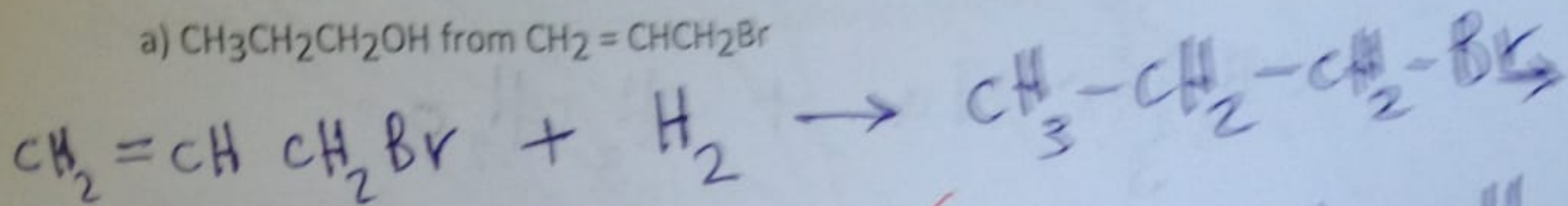


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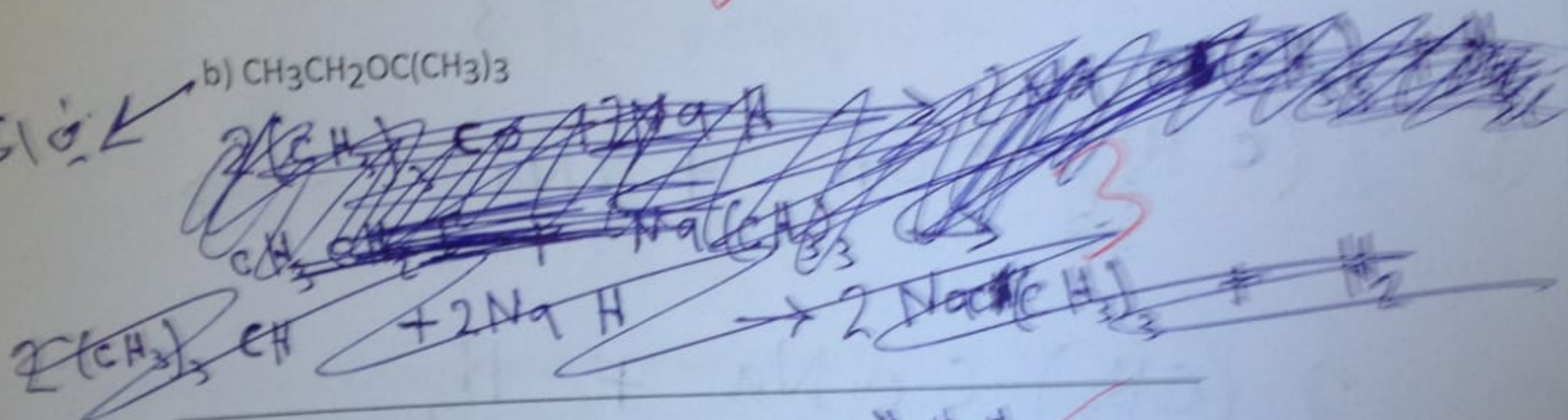
Dr. Omar Melad

2- By chemical equations, show how can you prepare the following:

a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ from $\text{CH}_2 = \text{CHCH}_2\text{Br}$

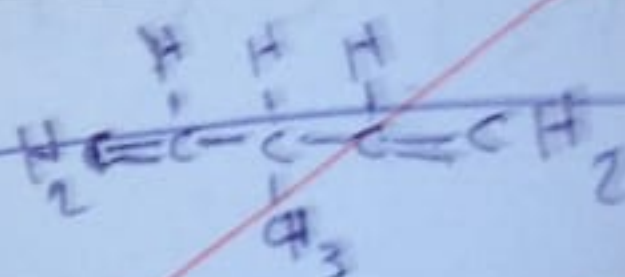


b) $\text{CH}_3\text{CH}_2\text{OC}(\text{CH}_3)_3$

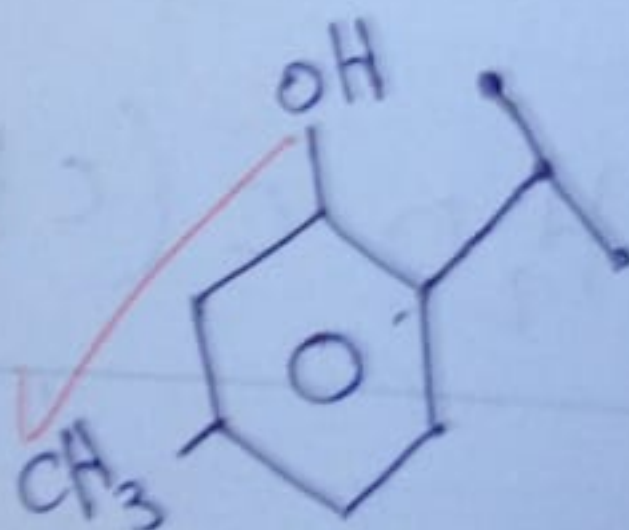


3- Draw the following:

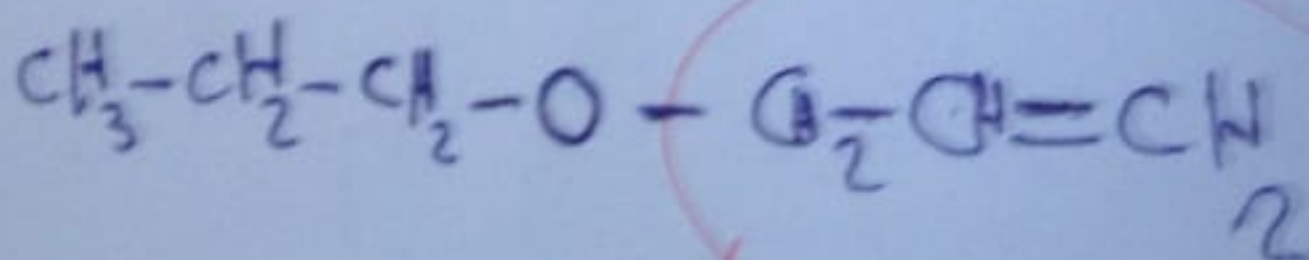
a) (S) 2-methyl-1,4-pentadiene



b) 2-isopropyl-5-methyl phenol

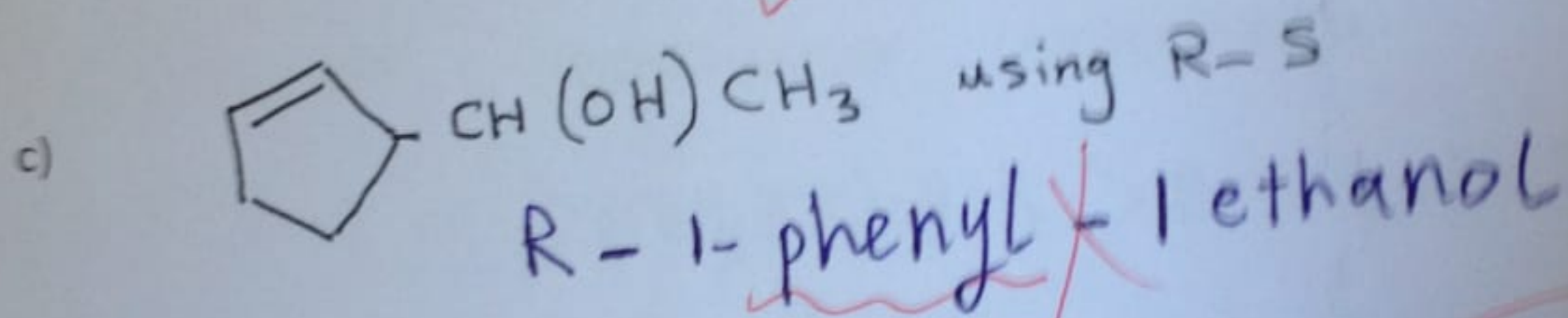
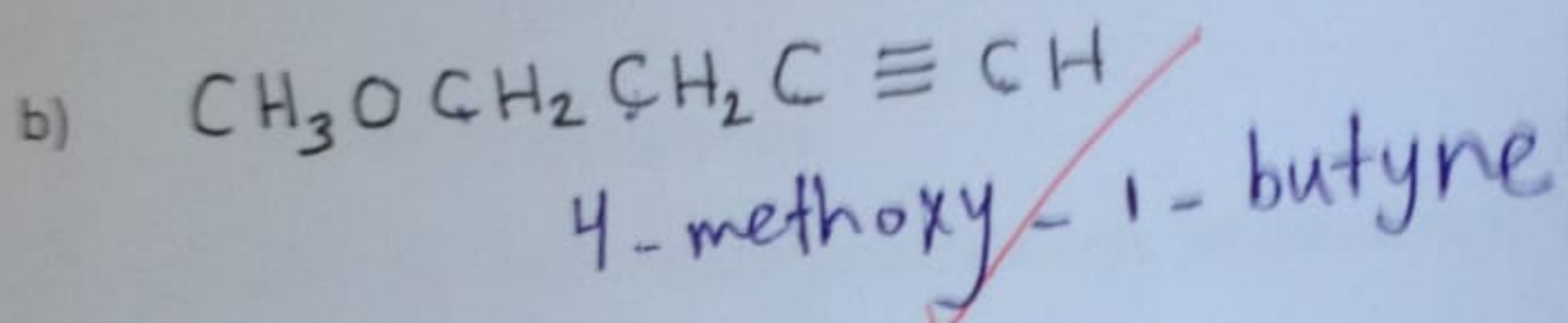
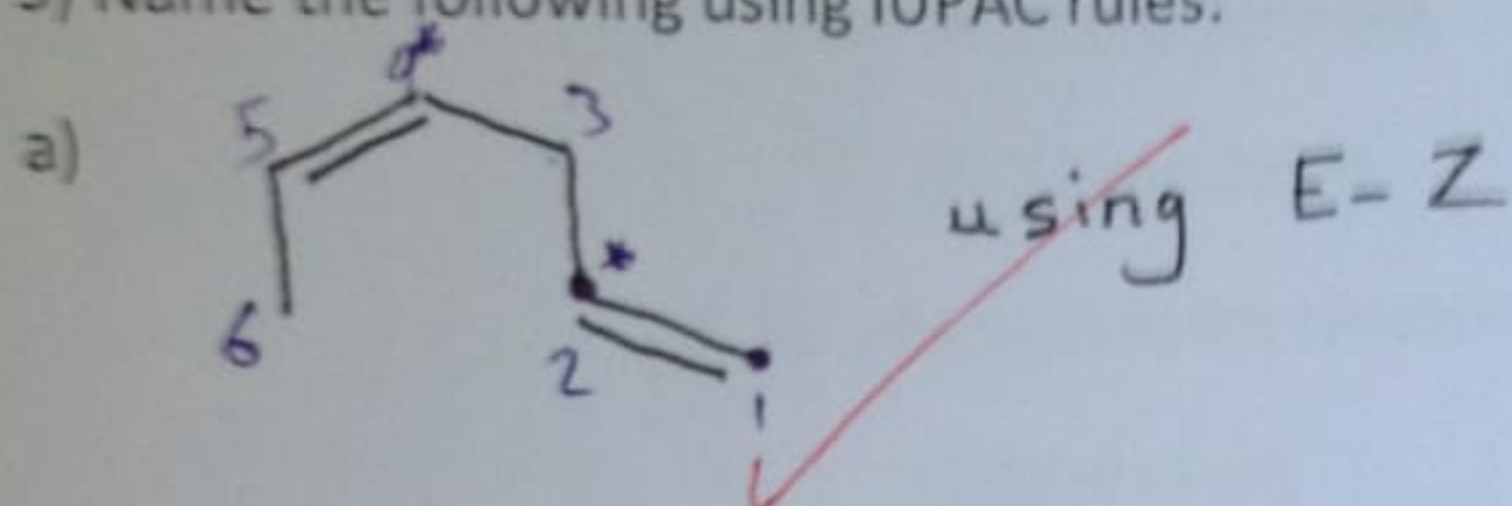


c) allyl propyl ether

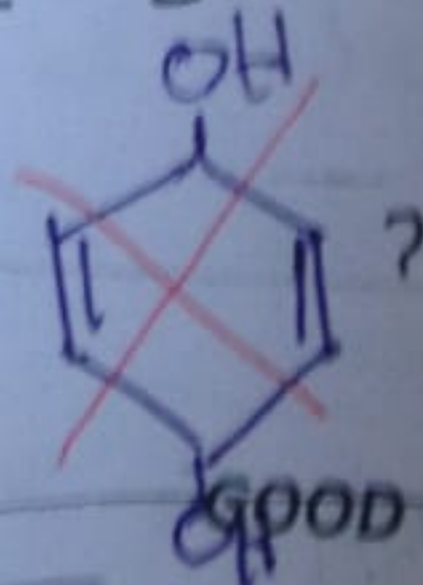
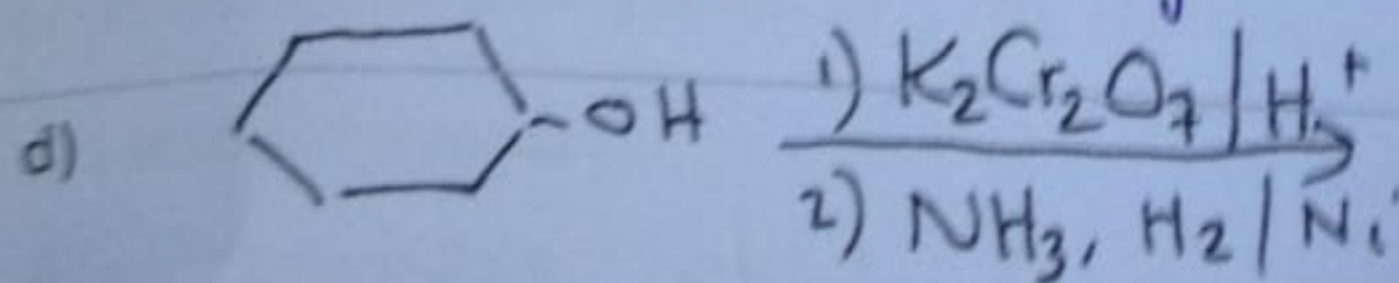
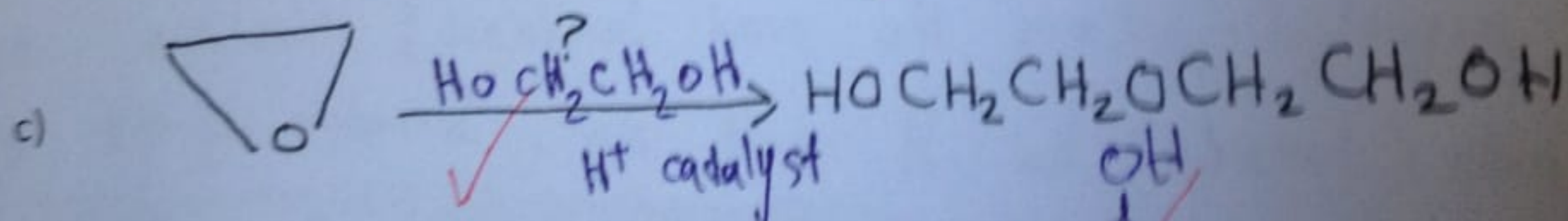
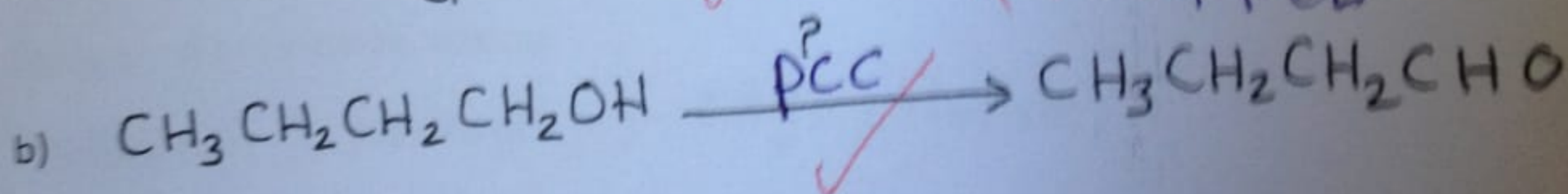
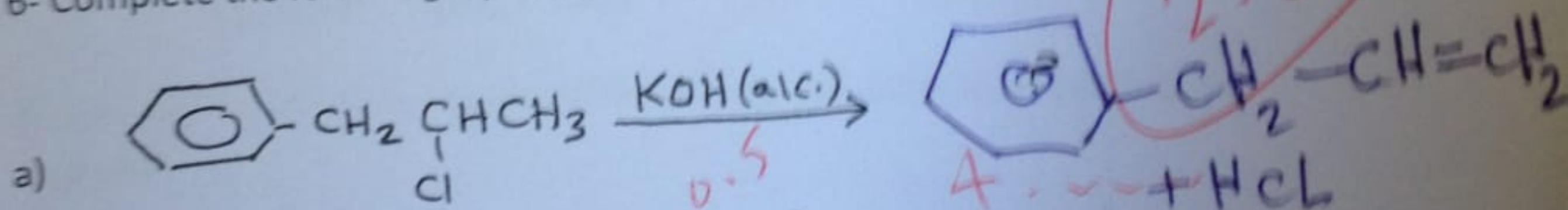


→ 2, Z - 1, 4 - hexadiene

5) Name the following using IUPAC rules:



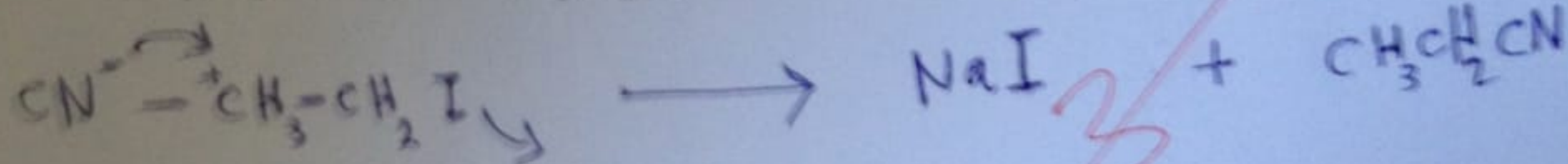
6- Complete the following equations:



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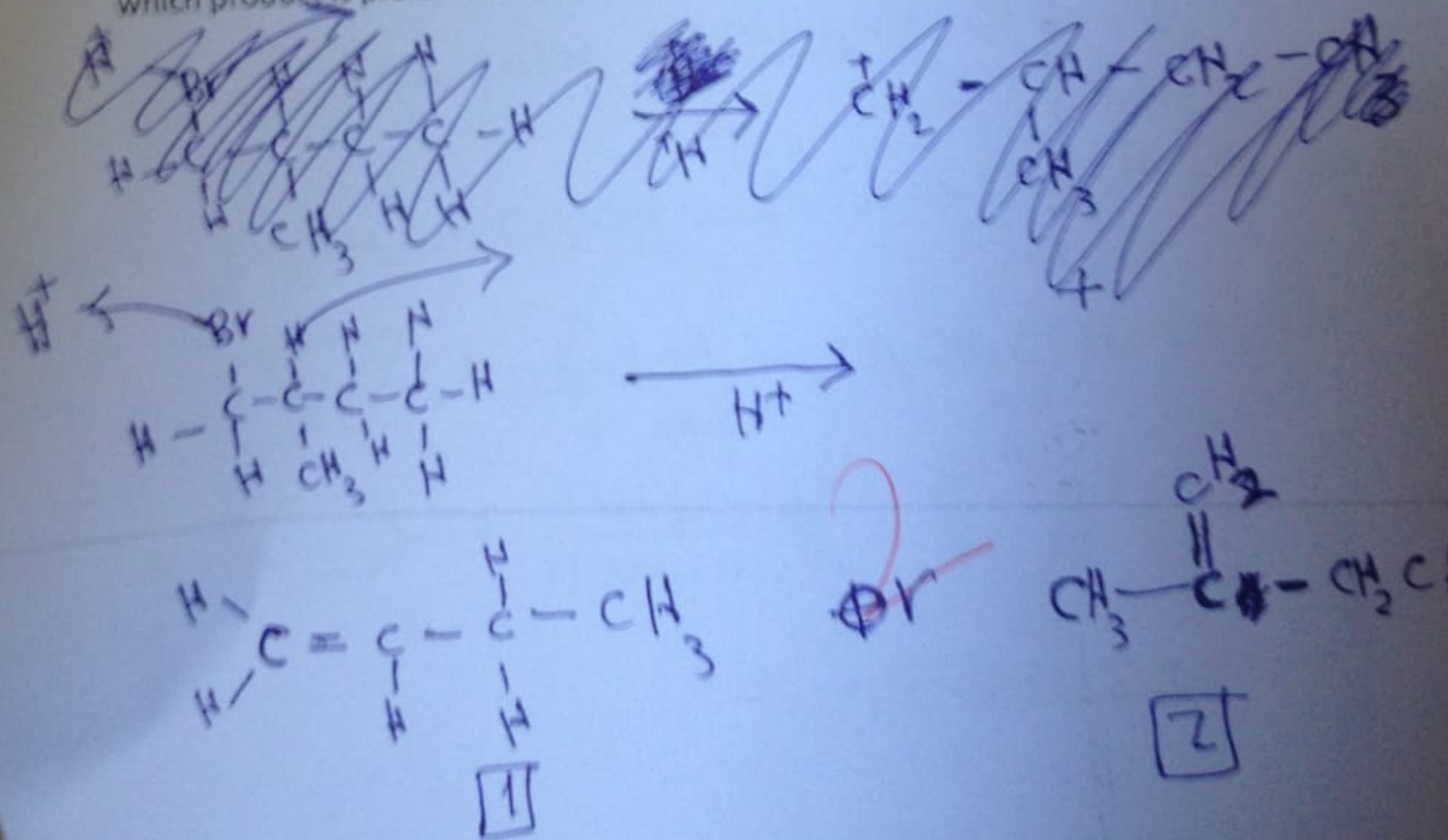
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4) a) Write the suitable mechanism for the following reaction:



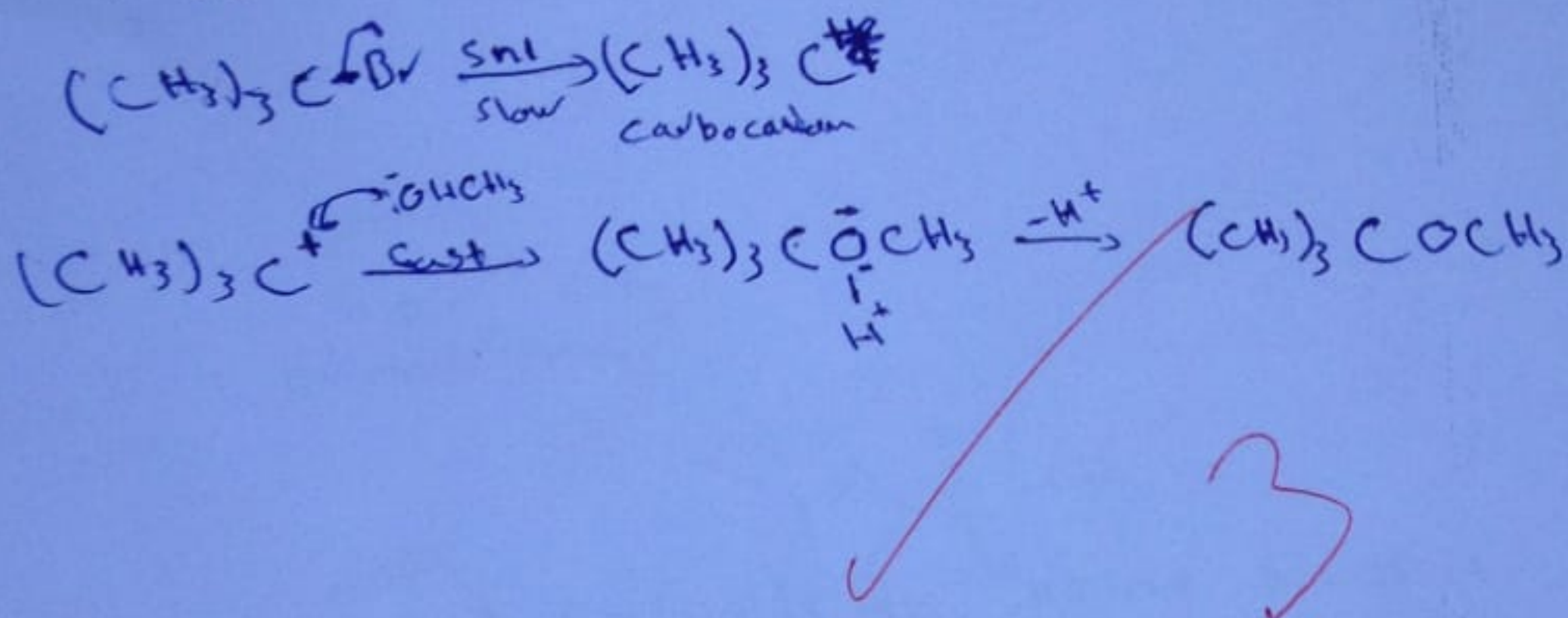
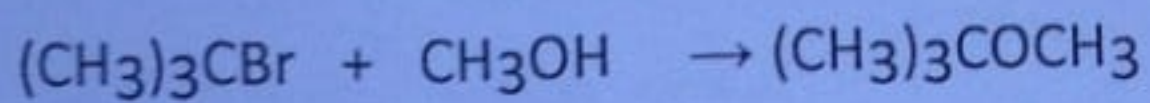
$\text{S}_\text{N}2$ mechanism

b) Give the structure of all the possible products (if any) when 1-bromo-2-methyl butane react by $\text{E}2$ mechanism, show the mechanism and tell which product is preferred and why?

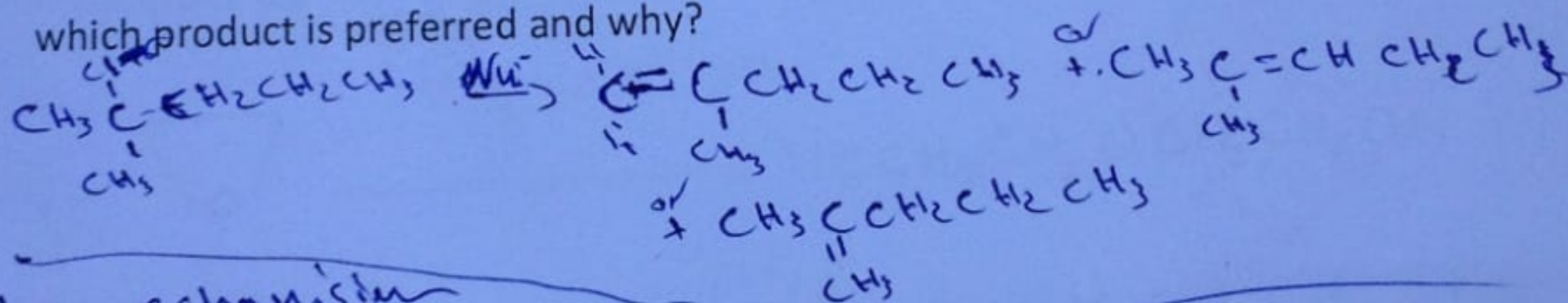


[1] is preferred because it has the most substituents

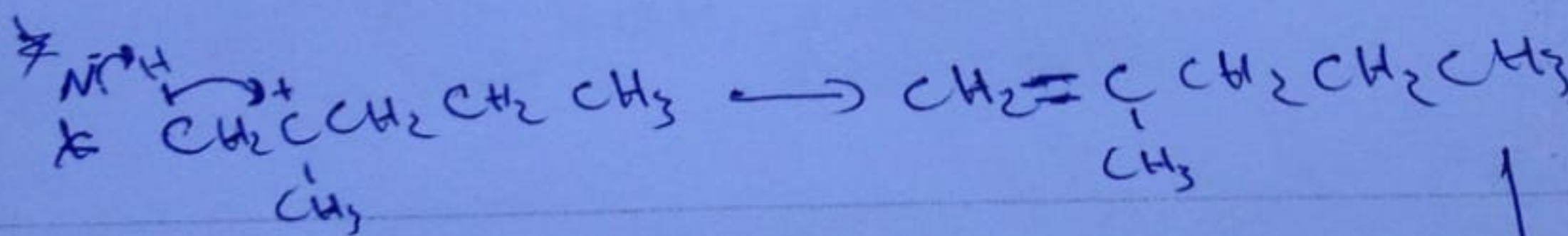
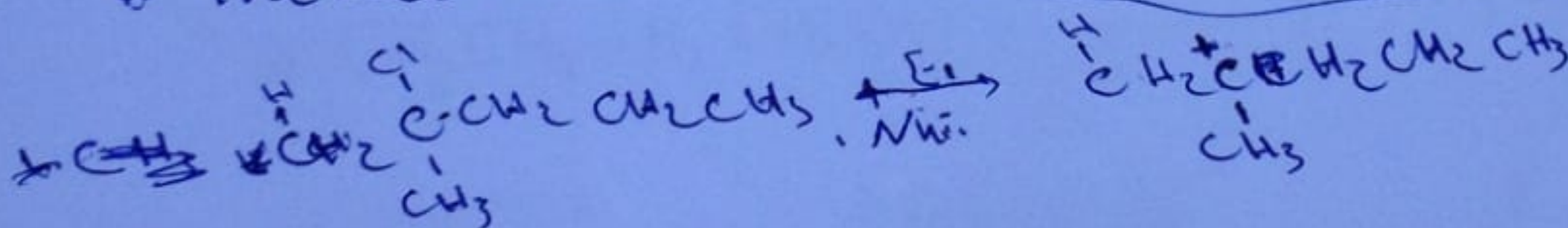
4) a) Write the suitable mechanism for the following reaction:



b) Give the structure of all the possible products (if any) when 2-chloro-2-methyl pentane react by E1 mechanism, show the mechanism and tell which product is preferred and why?



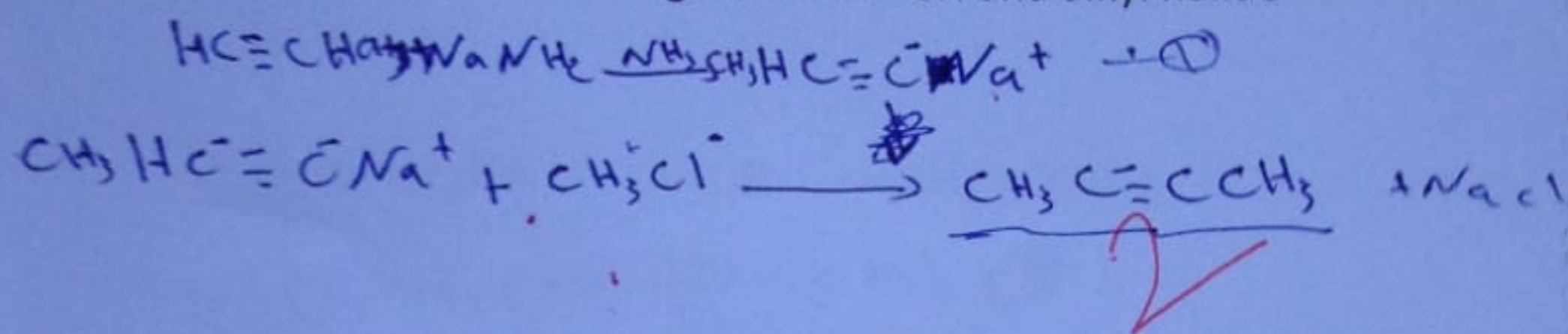
The mechanism



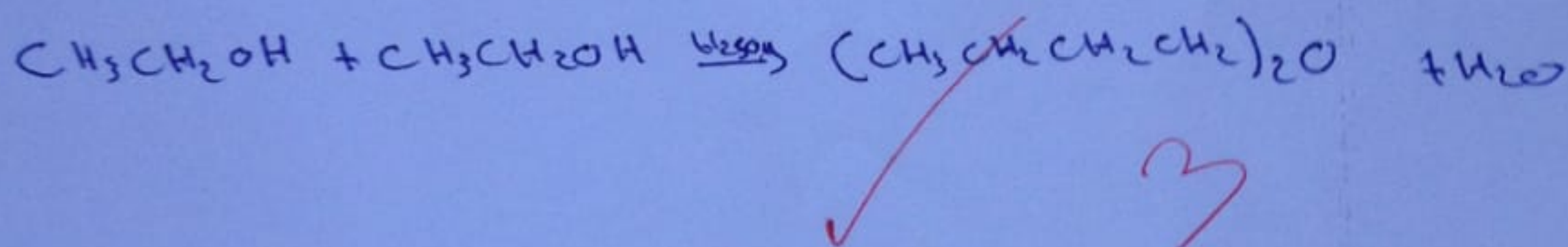
And so on

2- By chemical equations, show how can you prepare the following:

a) $\text{CH}_3\text{C}\equiv\text{CCH}_3$ from $\text{HC}\equiv\text{CH}$ and alkyl halide

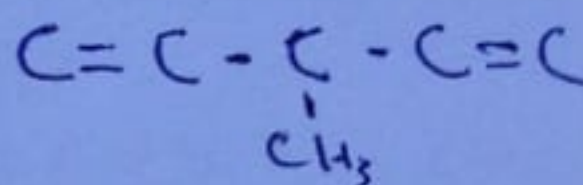


b) $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$

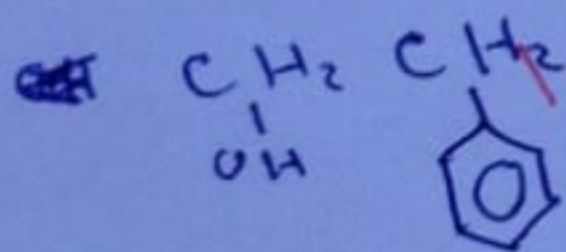


3- Draw the following:

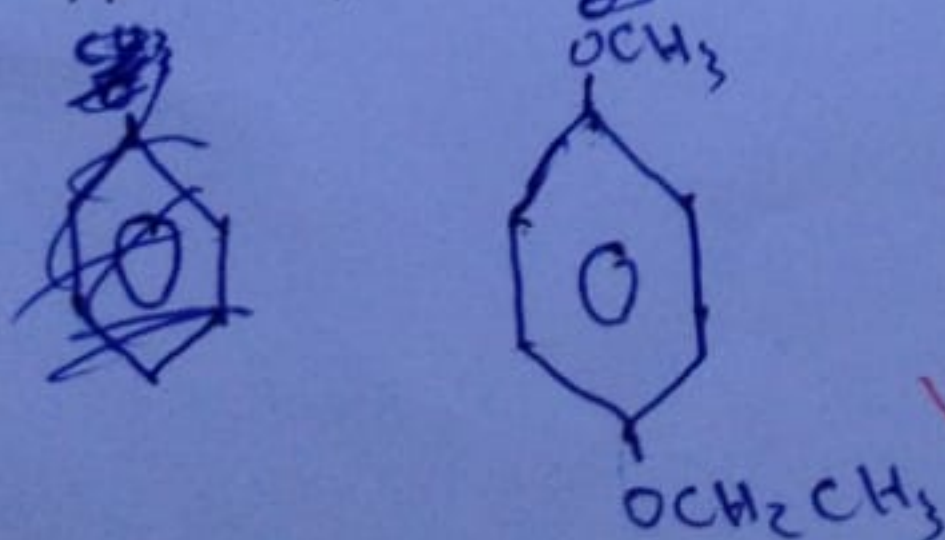
a) (R)-2-methyl-1,4-pentadiene



b) 2-phenyl-ethanol

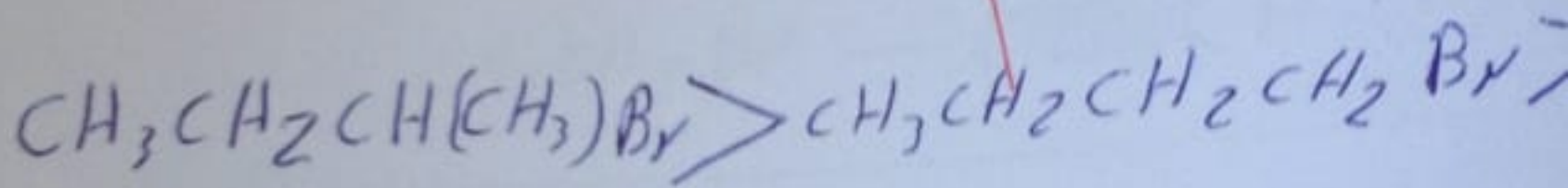
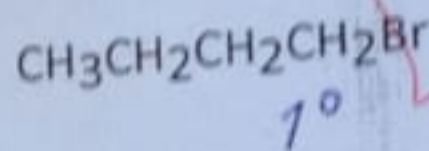
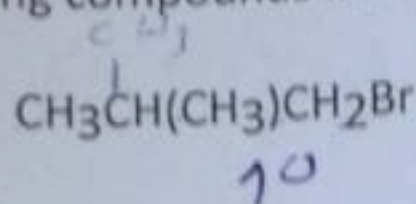
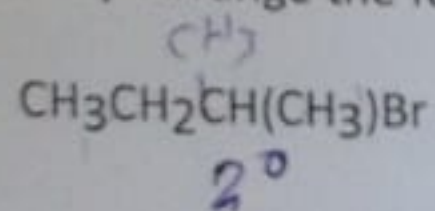


c) p-ethoxy anisole



Answer the following questions:

1- a) Arrange the following compounds in order of decreasing S_N1



b) Arrange the following in order of decreasing solubility in water and explain?

hexanol, ethyl chloride, ethanol

ethanol > hexanol > ethyl chloride

ethanol make hydrogen bond and so it is the most soluble

It is make hydrogen bond and has 6 C

c) Define the following terms by giving example: ethyl chloride has hydrogen

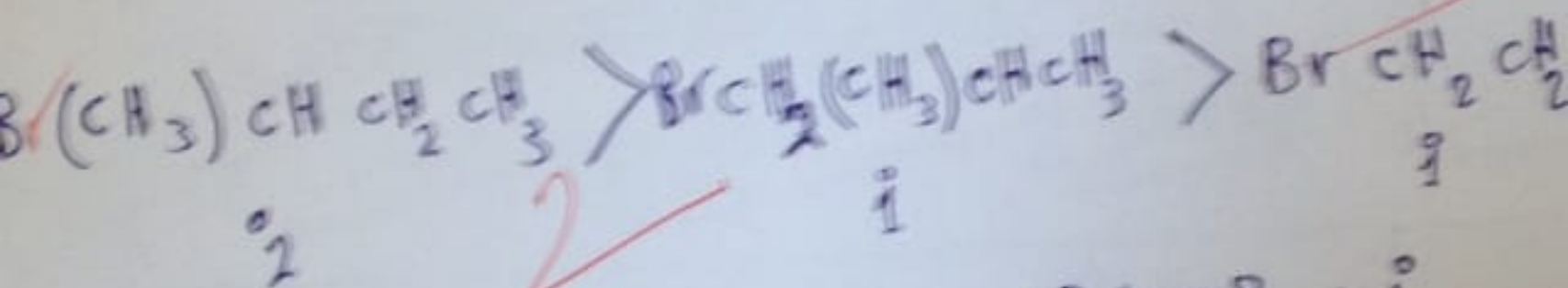
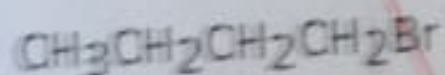
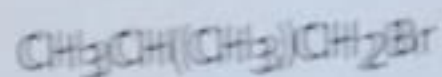
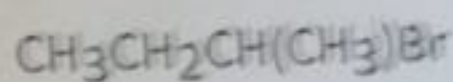
1) Meso compounds

diastereoisomers compound which has symmetric plane

2- Teflon

Answer the following questions:

1- a) Arrange the following compounds in order of decreasing S_N1



Because the S_N1 $3^\circ > 2^\circ > 1^\circ$

b) Arrange the following in order of decreasing solubility in water and explain?

hexanol, ethyl chloride, ethanol

ethanol > hexanol > ethyl chloride

because ethanol & hexanol have OH make hydrogen bonds with water > ethyl chloride, as the R of hexanol is longer than ethanol so ethanol is more soluble in water.

c) Define the following terms by giving example:

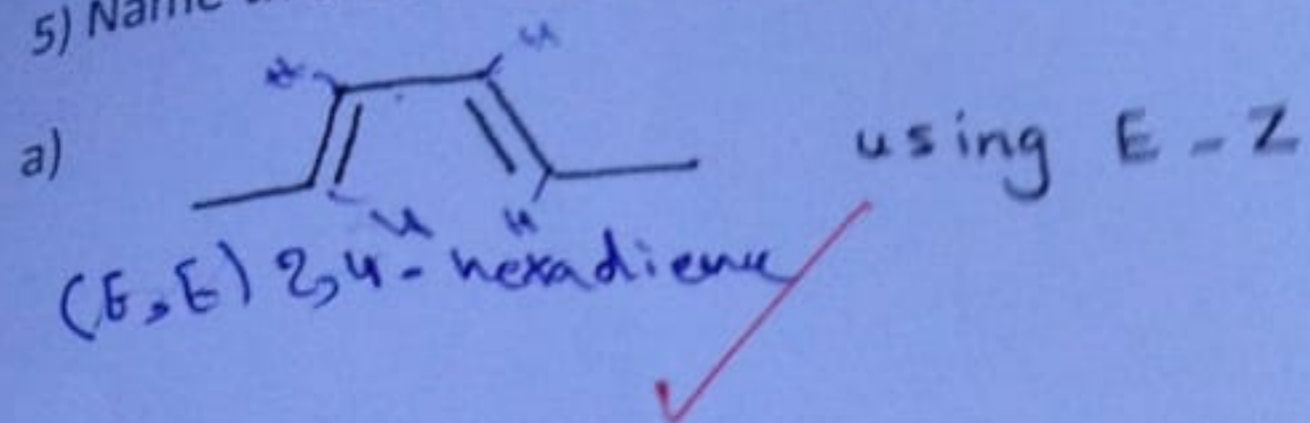
1) Meso compounds;

achiral diastereomers which have a plane of symmetry

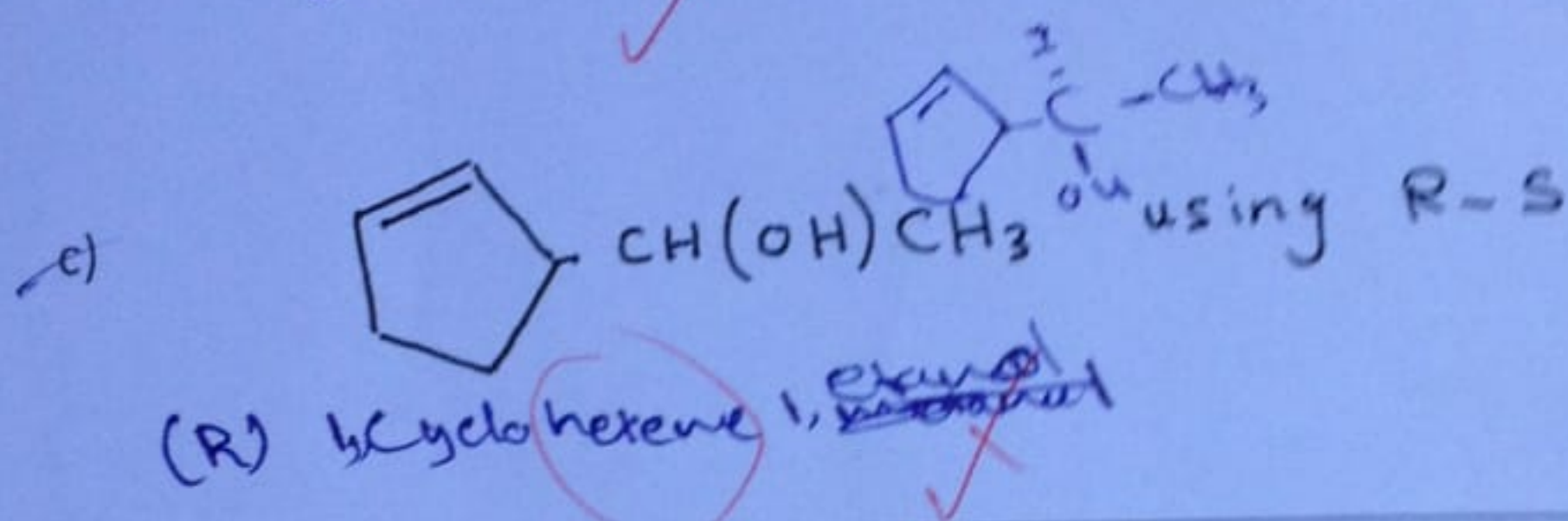
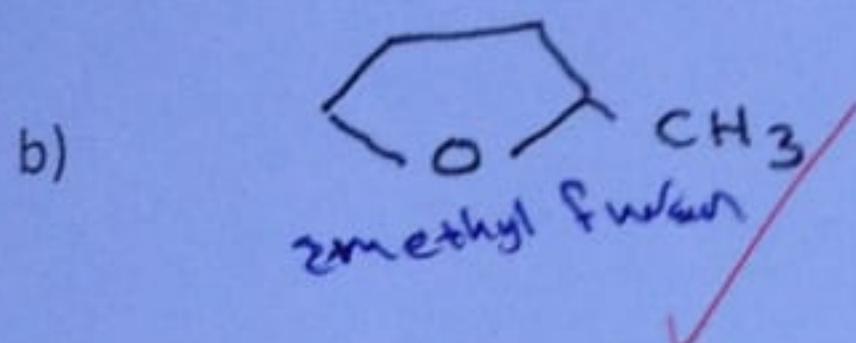
2- Teflon =

$\text{F}_2\text{C}=\text{CF}_2$ which is an organic compound which is industrially important. It is used to make $\sim(\text{F}_2\text{C}-\text{CF}_2)_n\cdot$ (monomer)

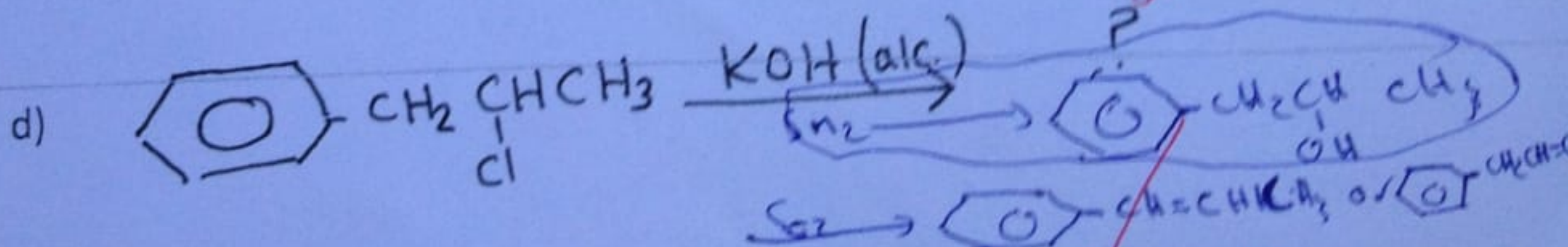
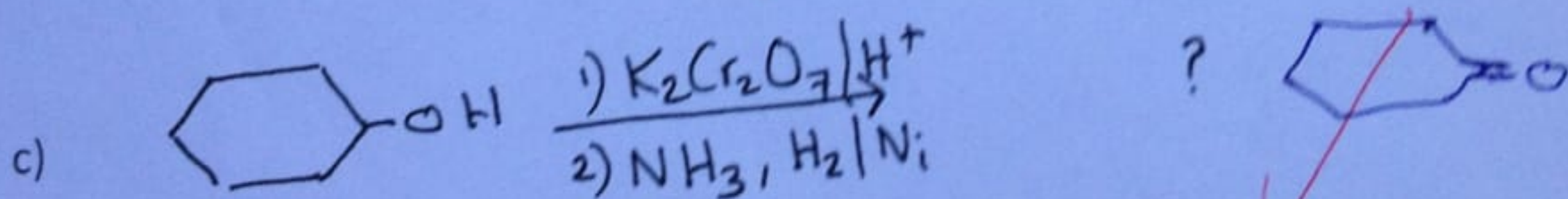
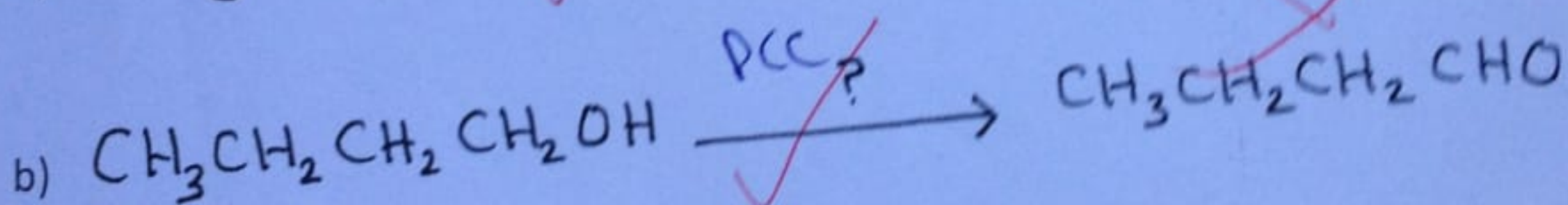
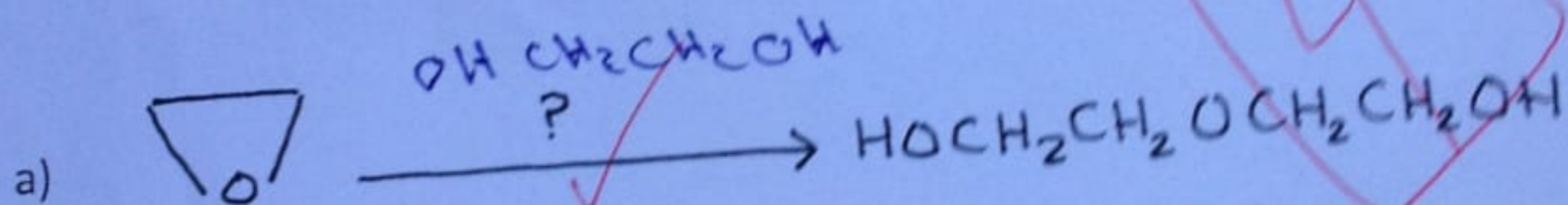
5) Name the following using IUPAC rules:



2.5



6- Complete the following equations:

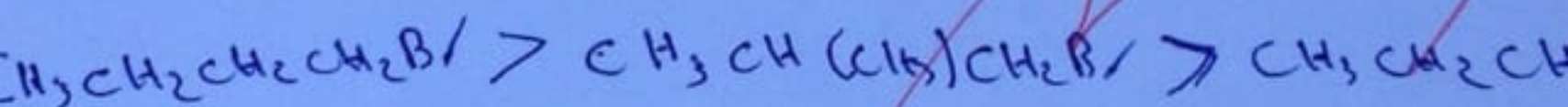
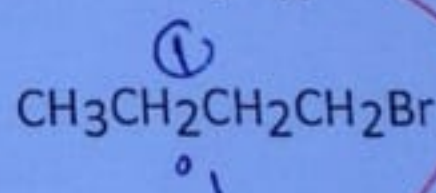
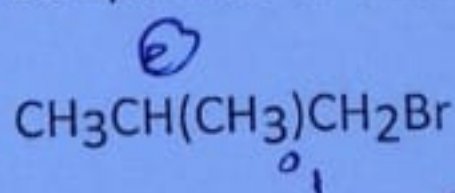
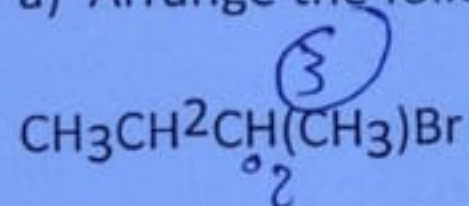


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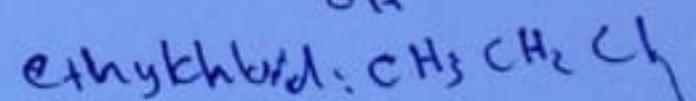
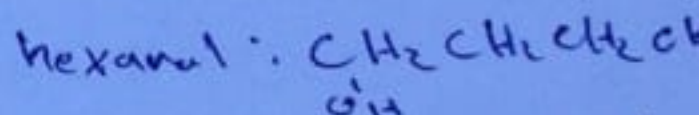
Answer the following questions:

a) Arrange the following compounds in order of decreasing S_N2



b) Arrange the following in order of increasing solubility in water and explain?

hexanol, ethyl chloride, ethanol



ethanol: $\text{CH}_3\text{CH}_2\text{OH}$
 it has OH it has Cl also
 can form hydrogen bond

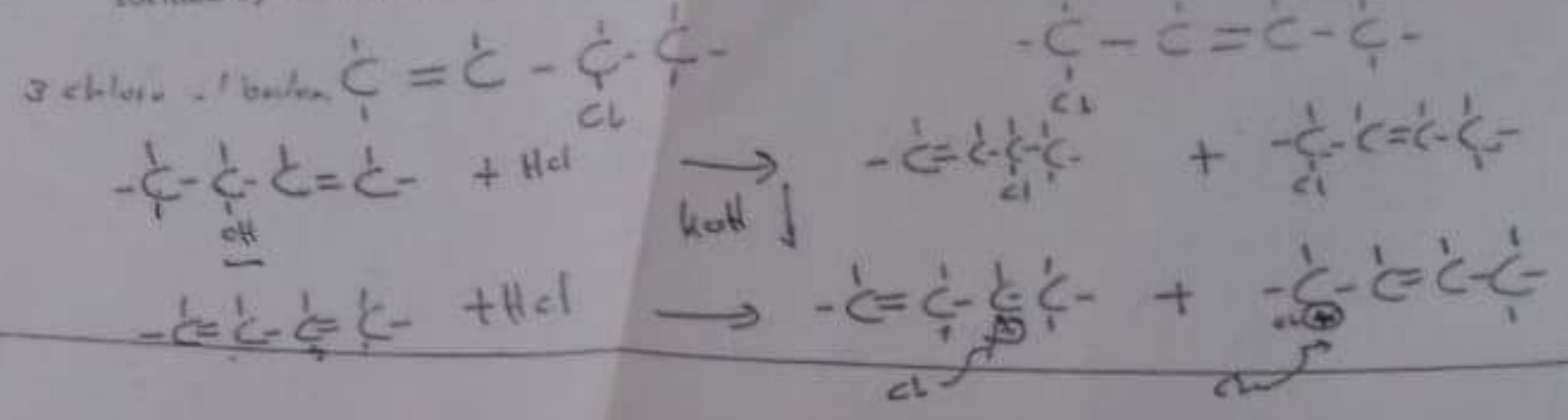
c) Define the following terms by giving example:

1- Racemic modification

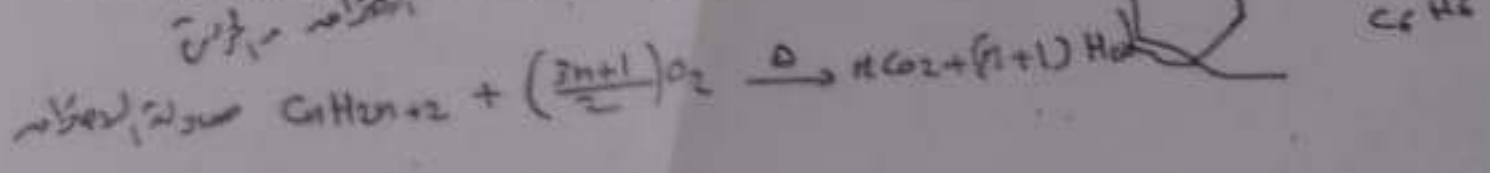
~~the Result is low~~

2- Freon

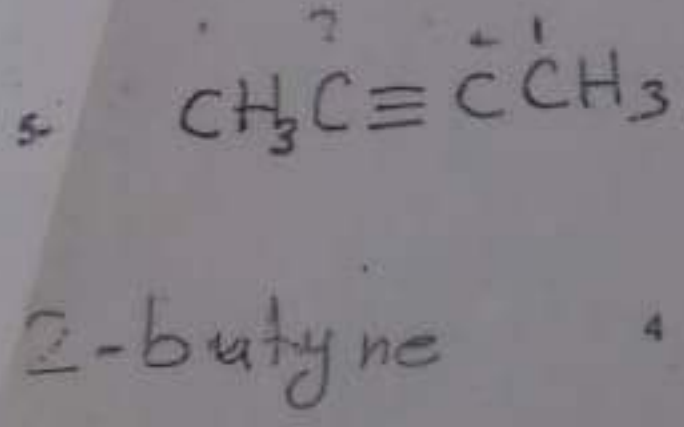
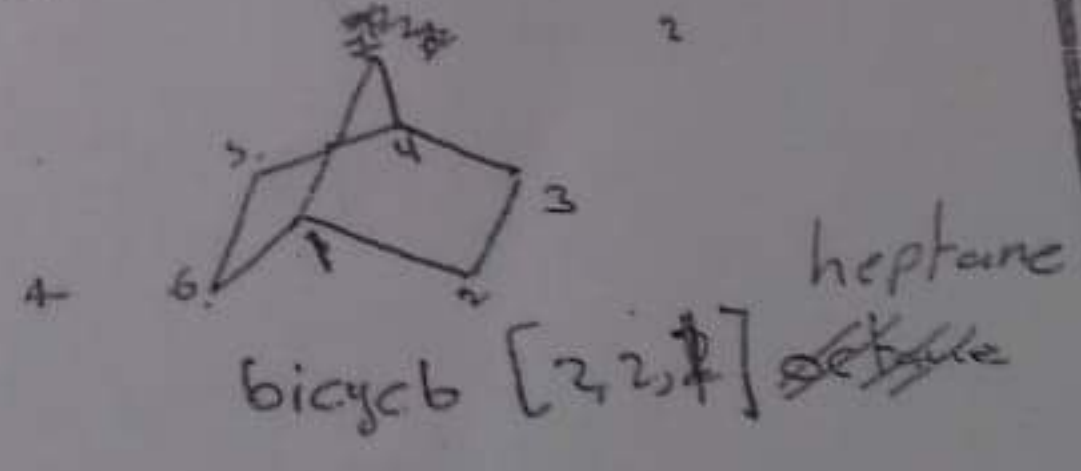
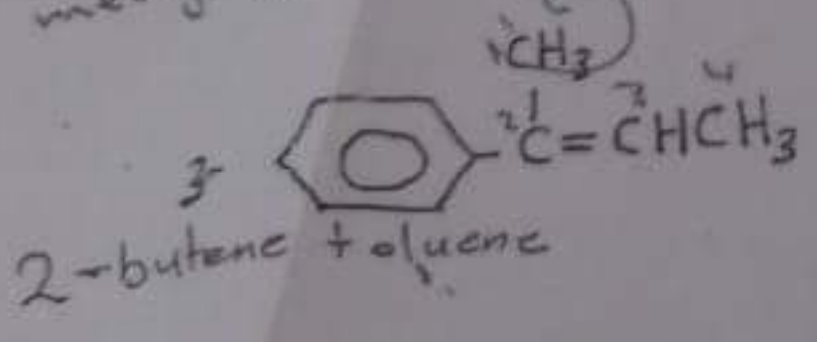
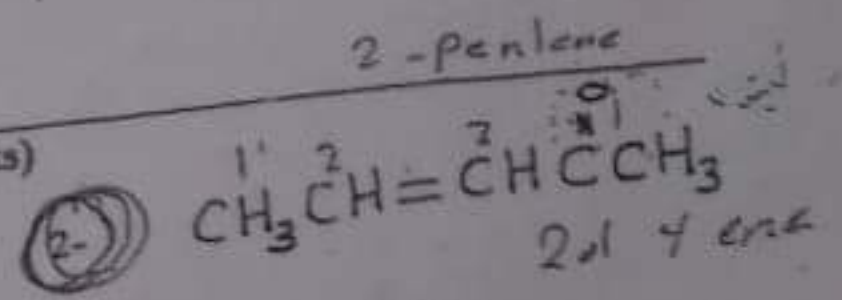
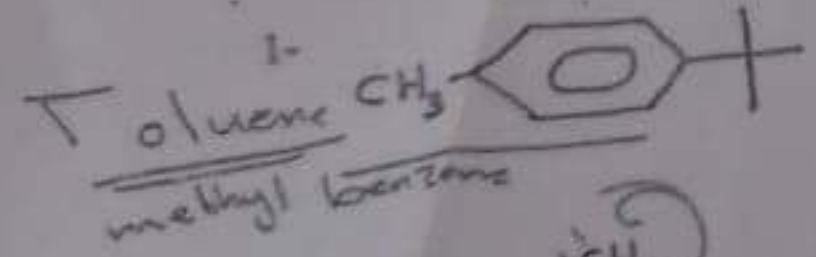
5- a) Treatment of 3-butene-2-ol with Conc. HCl gives a mixture of two products, 3-Chloro-1-butene and 1-Chloro-2-butene. Explain how both products are formed by mechanism? (5 pts)



b) Baeyer Strain theory explained the stability of cycloalkanes by means of heat of combustion. Explain? (5 pts)



5- Name the following compounds: (10pts)



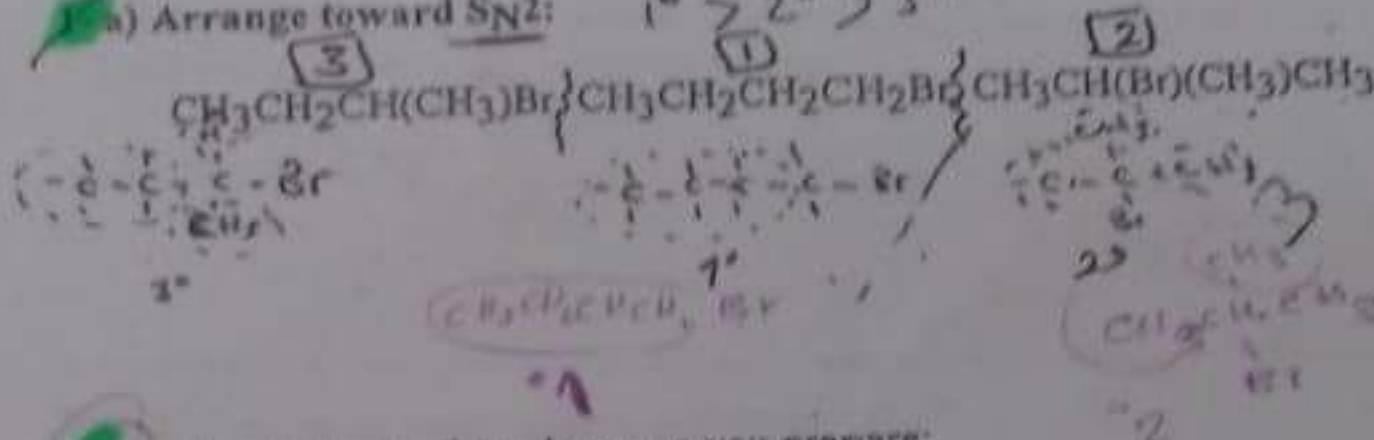
Al-Azhar University-GAZA
Chemistry Department
2nd Mid-Term Exam.
Organic Chemistry for Biological Science

19/11/2015 (A)

Name: Ali, Ali, Ali

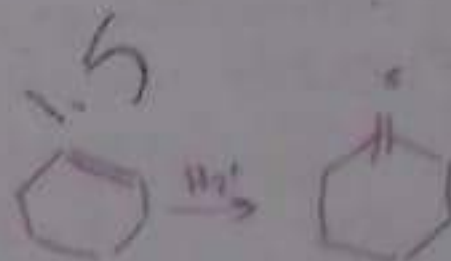
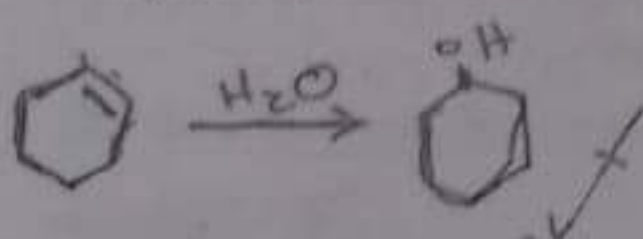
Answer the following questions:

a) Arrange toward S_N2 : $1^\circ > 2^\circ > 3^\circ$



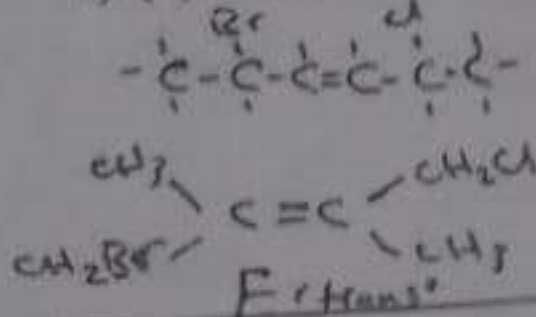
b) By chemical equations, how can you prepare:

Cyclohexanone from Cyclohexene

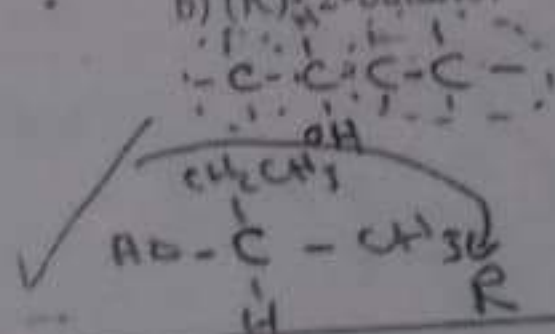


2- Draw the following:

a) (E)-2-bromo-5-chloro-3-hexene

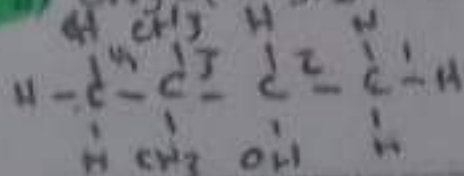


b) (R)-2-butanol



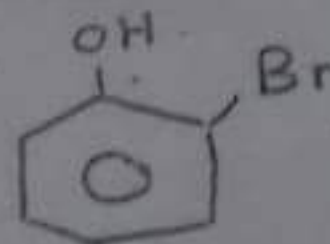
3- Name the following:

a) $\text{CH}_3\text{C}(\text{CH}_3)_2\text{CH}(\text{OH})\text{CH}_3$



3,3-dimethyl-2-butanol

3,3 dimethyl-2-butanol



2-Bromophenol

2-Bromophenol

Al-Azhar University-GAZA

Chemistry Department

Prof. Dr. Omar Melad

Organic Chemistry for Biology

2nd Mid-Term Exam.

28/11/2017

اسم الطالب/

Answer the following questions:

1- a) Determine the order of reactivity for $(CH_3)_2CHCH_2Br$, $(CH_3)_3CBr$.

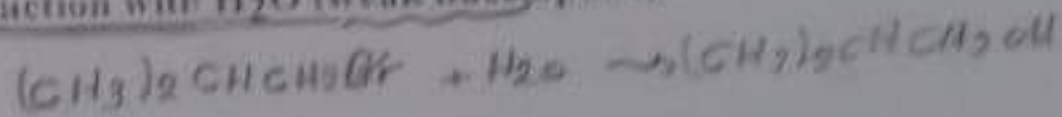
② $CH_3CH(Br)CH_2CH_3$ in substitution reaction with H_2O (weak nucleophile).

1° weak S_N1

2° weak S_N1

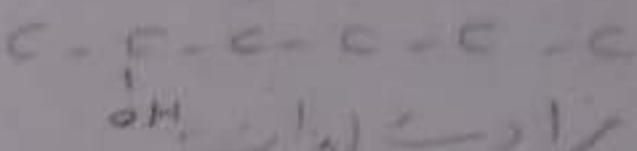
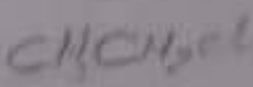
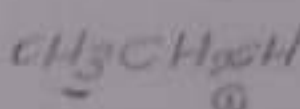
3° weak S_N1

S_N1 , $3 > 2 > 1$



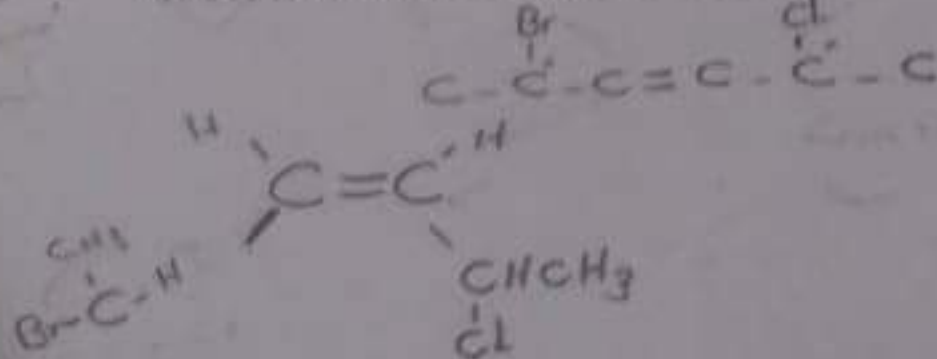
b) Arrange the following in order of increasing solubility of water:

① Ethanol, ② ethyl chloride, ③ 2-hexanol.

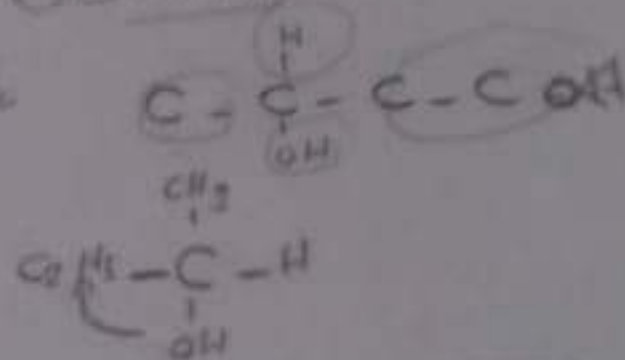


2- Draw the following:

a) (Z)-2-bromo-5-chloro-3-hexene

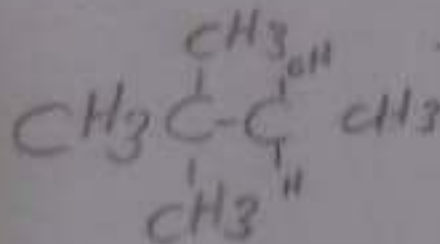


b) (S)-2-butanol



3- Name the following:

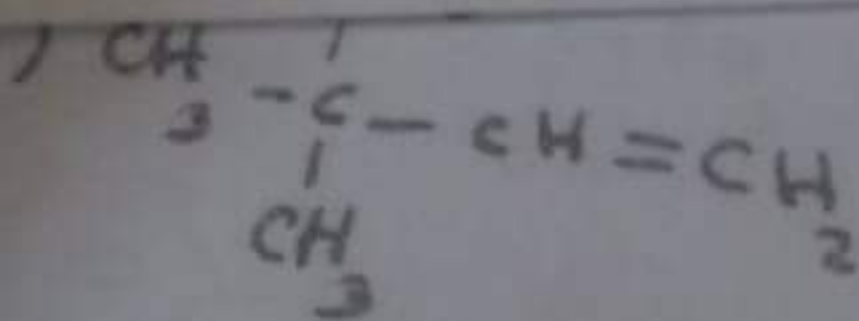
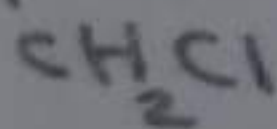
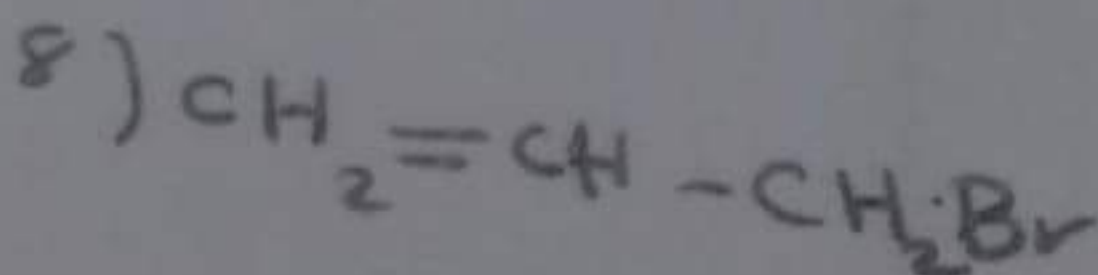
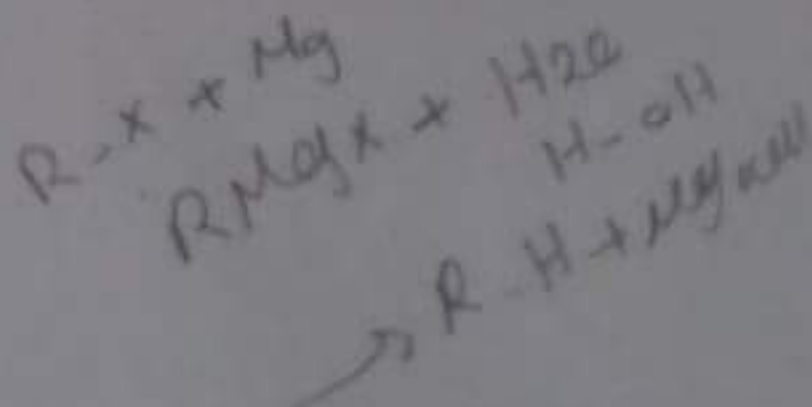
a) $CH_3C(CH_3)_2CH(OH)CH_3$



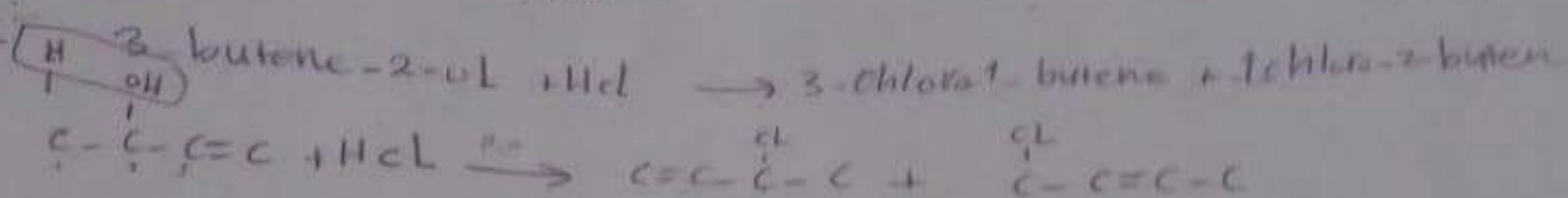
3,3-dimethyl-2-butanol

b) $(CH_3)_2CHO^-K^+$

Pot. iso propoxide

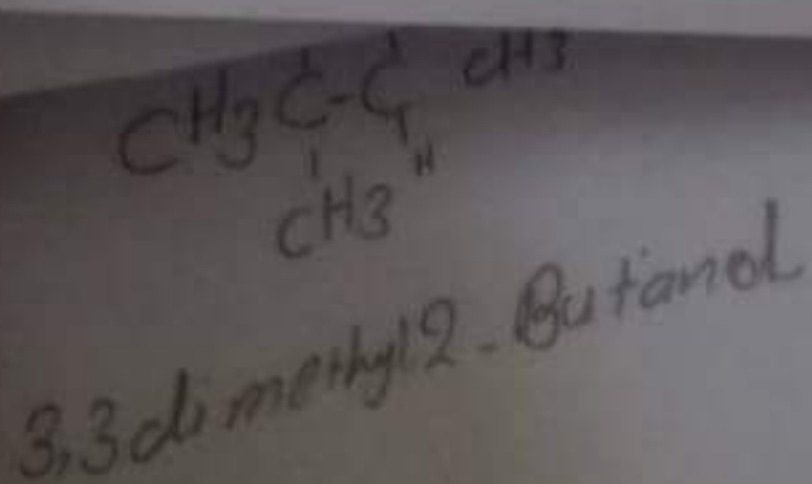
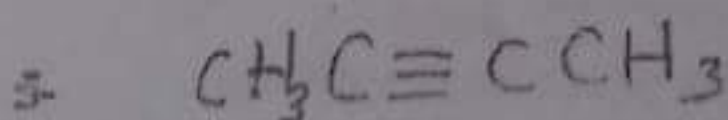
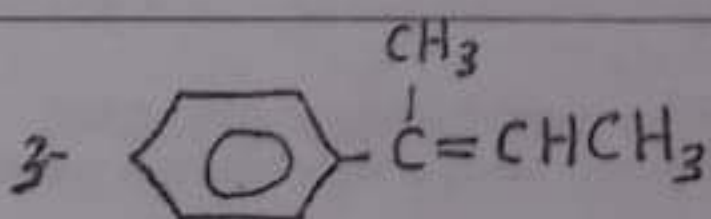
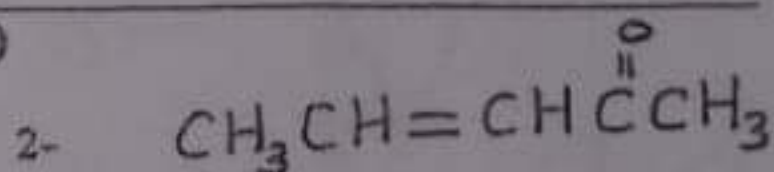
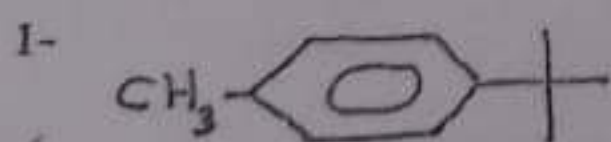


5- a) Treatment of 3-butene-2-ol with Conc. HCl gives a mixture of two products, 3-Chloro-1-butene and 1-Chloro-2-butene. Explain how both products are formed by mechanism? (5 pts)



b) Baeyer Strain theory explained the stability of cycloalkanes by means of heat of combustion. Explain? (5 pts)

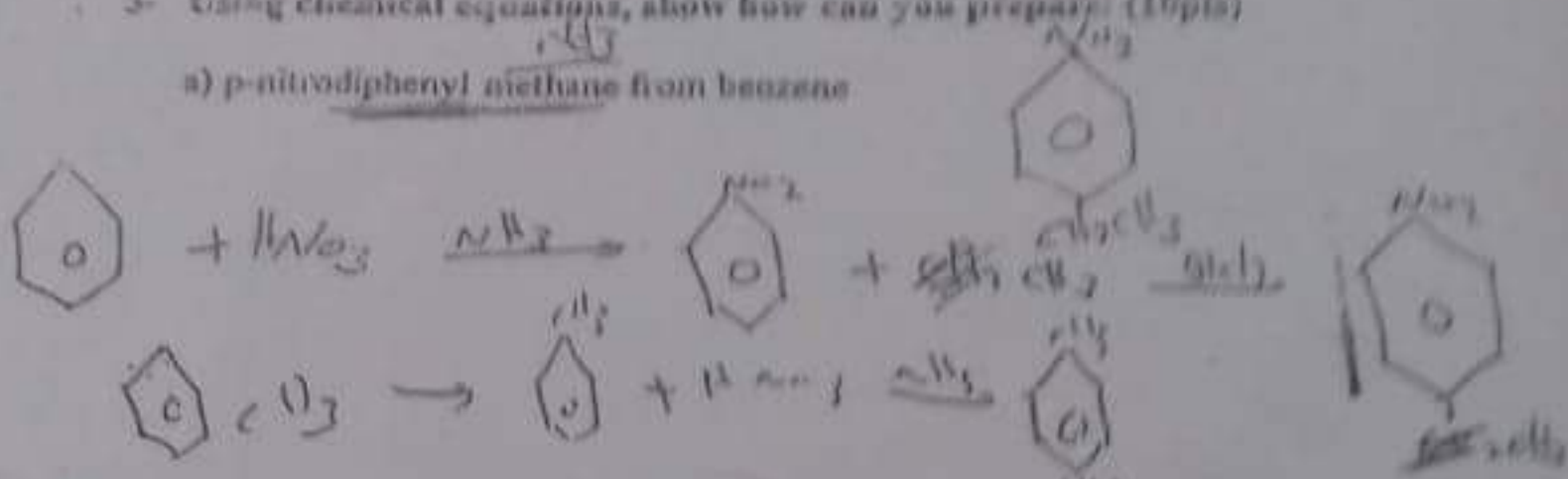
5- Name the following compounds: (10pts)



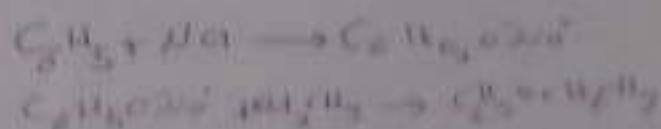
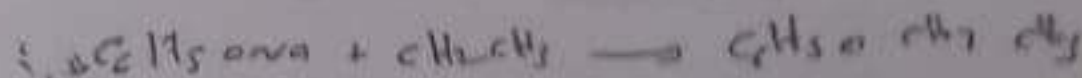
R-X
R-MgX

3. Using chemical equations, show how can you prepare: (10pts)

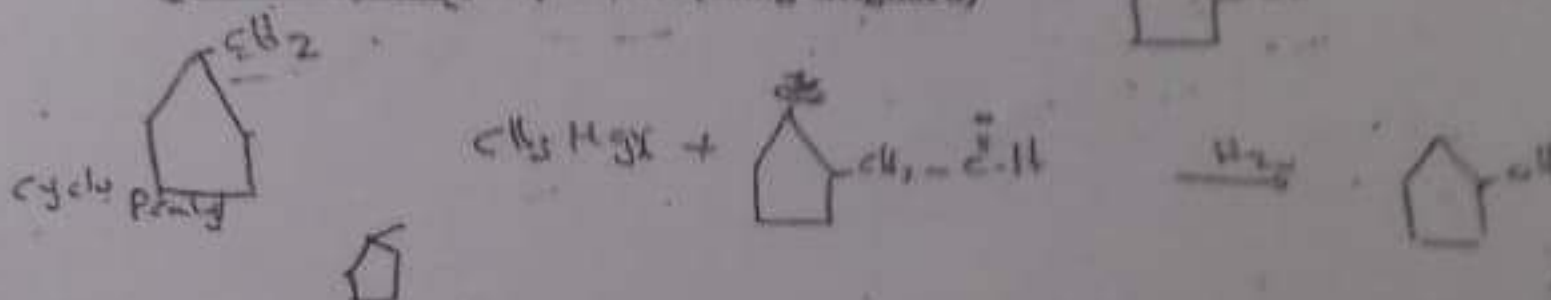
a) p-nitrodiphenyl methane from benzene



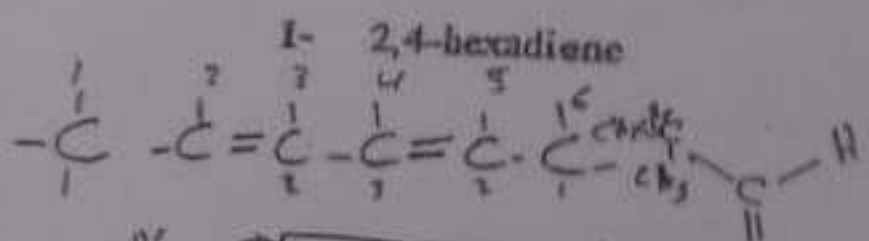
b) C6H5OCH2CH3 (Ester synthesis)



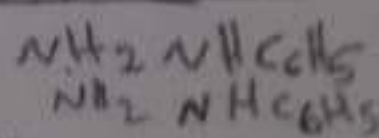
c) 1-cyclopentylcyclopentanol (using Grignard)



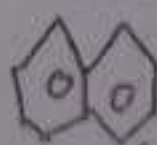
4. a) Draw the structure of the following: (10pts)



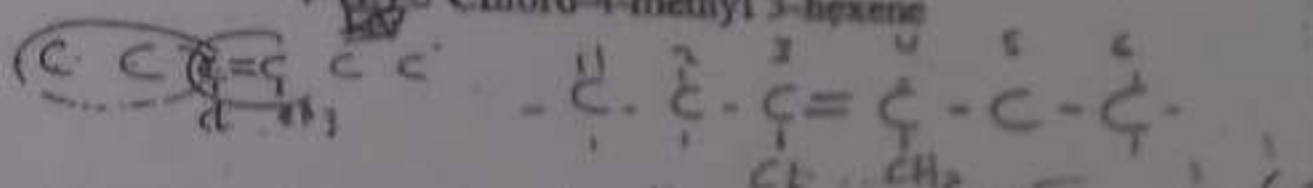
2- Phenyl hydrazine



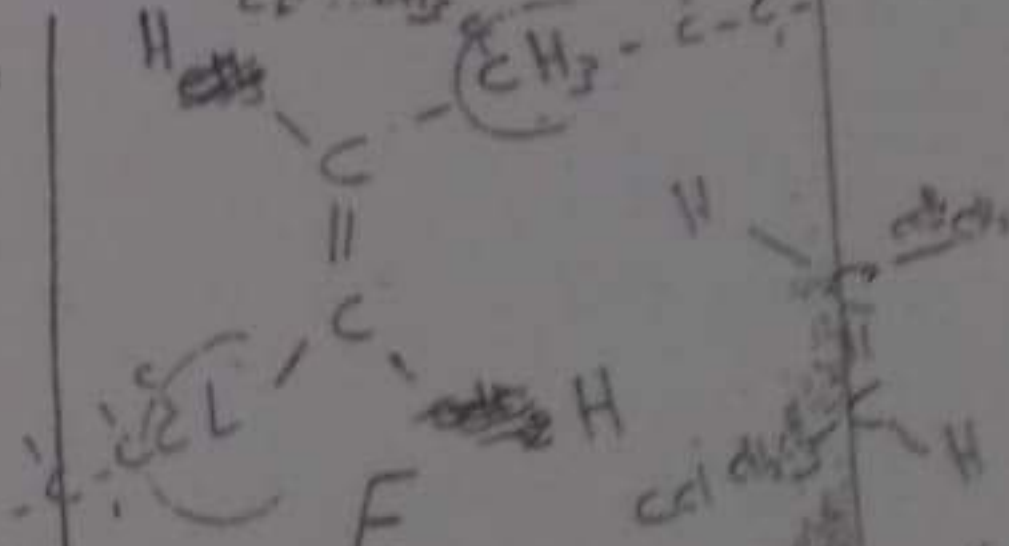
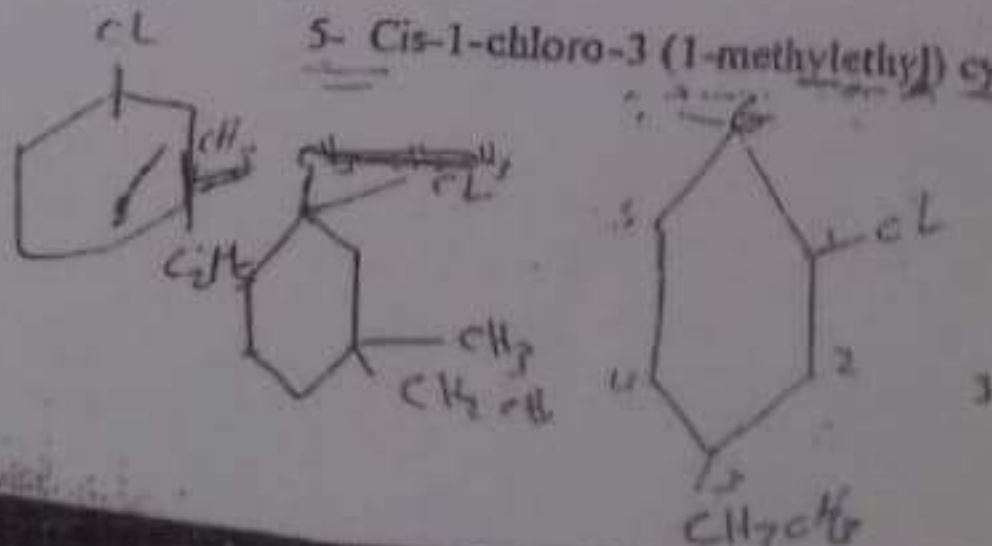
3- Naphthalene



4- (E)-3-Chloro-4-methyl-3-hexene

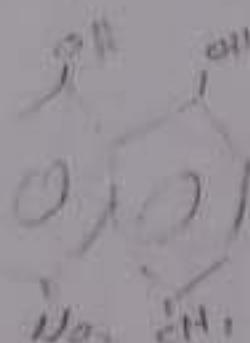


5- Cis-1-chloro-3 (1-methylethyl) cyclohexane



3- Using chemical equations, show how can you prepare: (10pts)

a) p-nitrodiphenyl methane from benzene



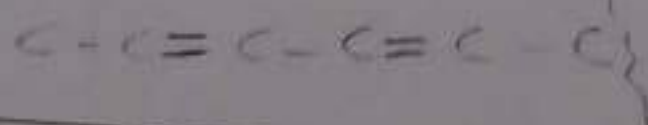
b) $C_6H_5OCH_2CH_3$ (Ester synthesis)



c) 1-cyclopentylcyclopentanol (using Grignard)

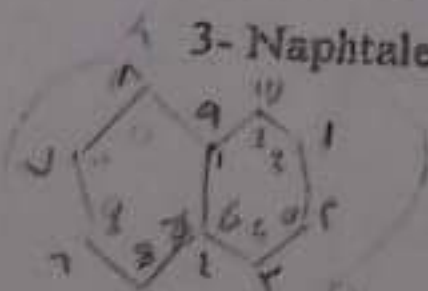
4- a) Draw the structure of the following: (10pts)

1- 2,4-hexadiene

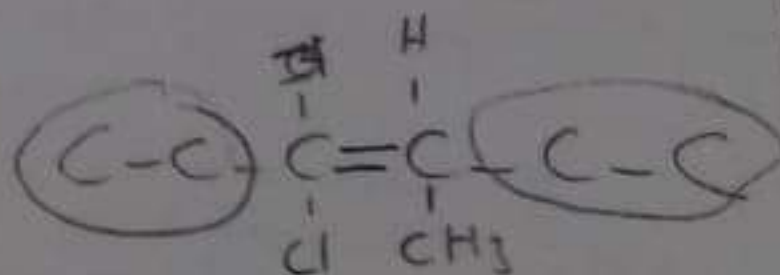


2- Phenyl hydrazine

3- Naphtalene



4- (E)-3 Chloro-4-methyl 3-hexene

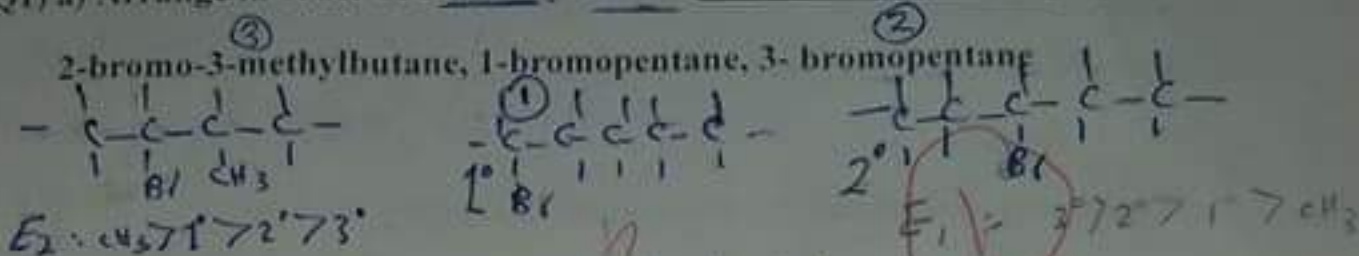


5- Cis-1-chloro-3 (1-methylethyl) cyclohexane

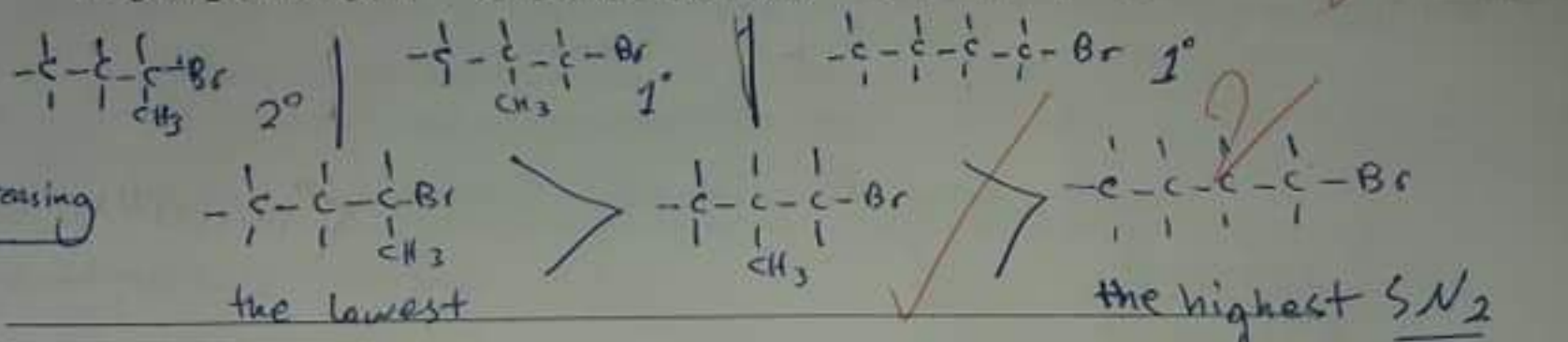
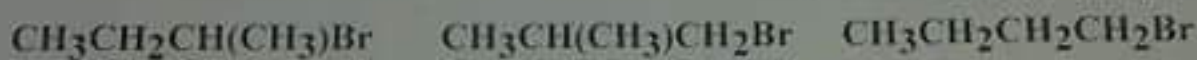


Answer the following questions:

Q1) a) Arrange in order of reactivity toward dehydrohalogenation? (2pts.)

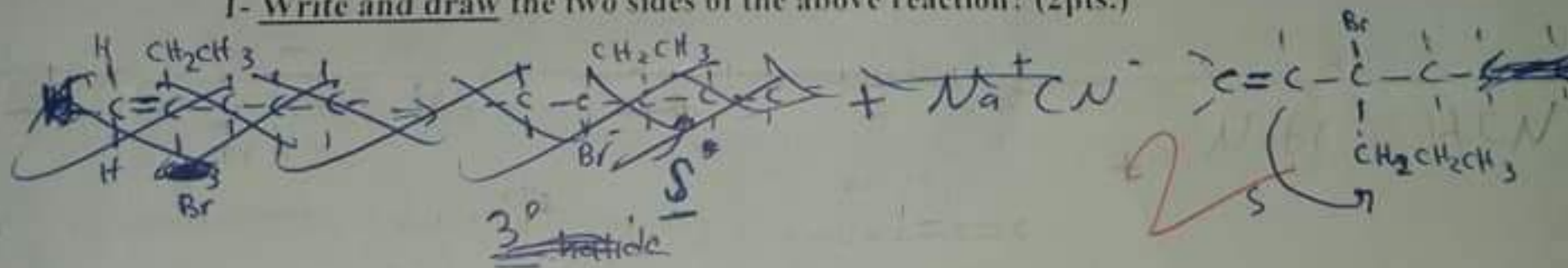


b) Arrange the following compounds in order of decreasing S_N2 ? (2pts.)

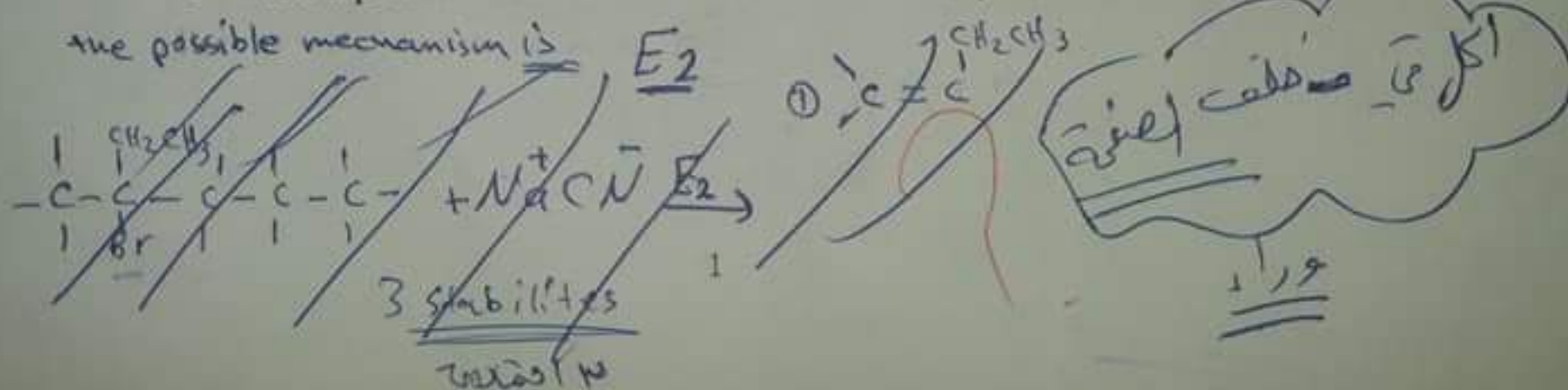


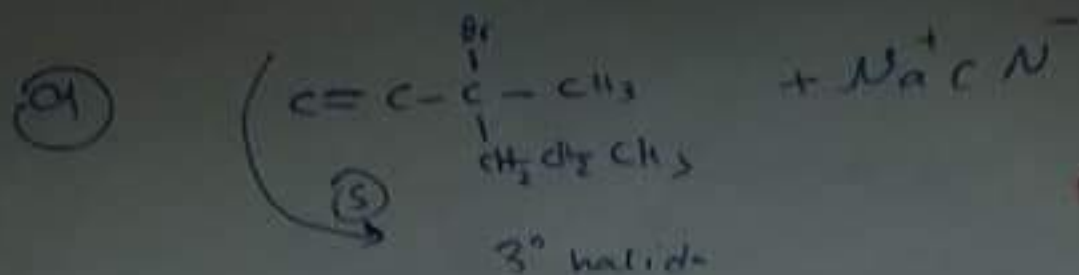
Q2) a) If (S) -3-bromo-3-methylhexene reacts with NaCN (strong nucleophile):

1- Write and draw the two sides of the above reaction? (2pts.)

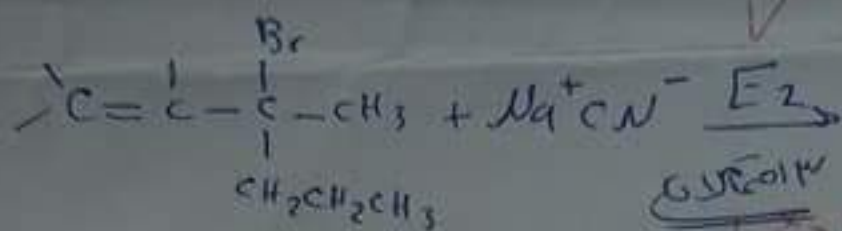


2- Write a possible mechanism for this reaction? (3pts.)

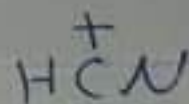
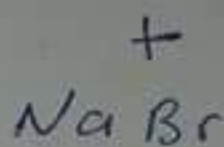
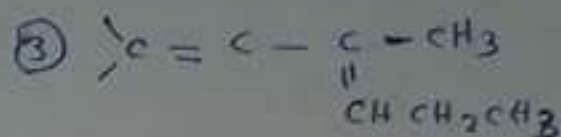
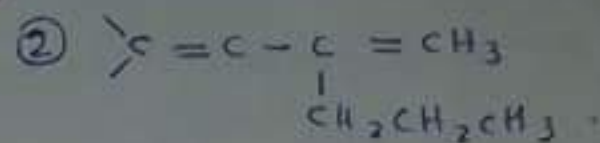
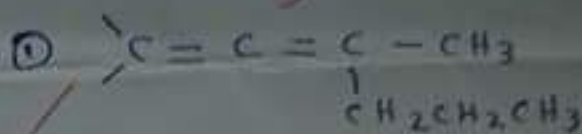




(b) the mechanism is E_2 ✓



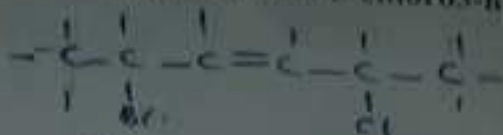
This is not the mechanism



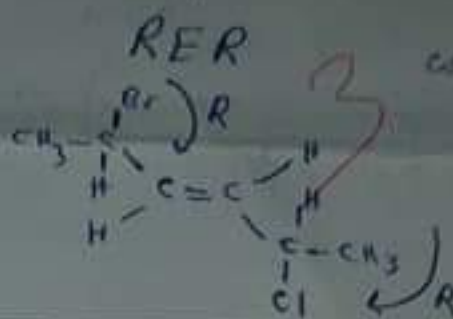
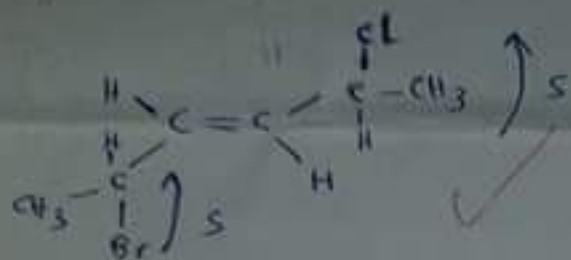
3- Draw all the possible stereoisomerism for 2-bromo-5-chloro-3-hexene (3pts.)

BES

2



BES
S 2 R
R 2 S
R 2 S
E



Q3) Which of the following scientific statements are true and which are false? (6pts.)

1- [X] Electrophilic aromatic substitution is the characteristic reactions for alcohols. benzene.

2- [X] The S_N1 reaction occurs with inversion of configuration. racemic.

3- [X] In acid dehydration of 2-methyl-2-butanol, the major product is 2-methyl-1-butene.

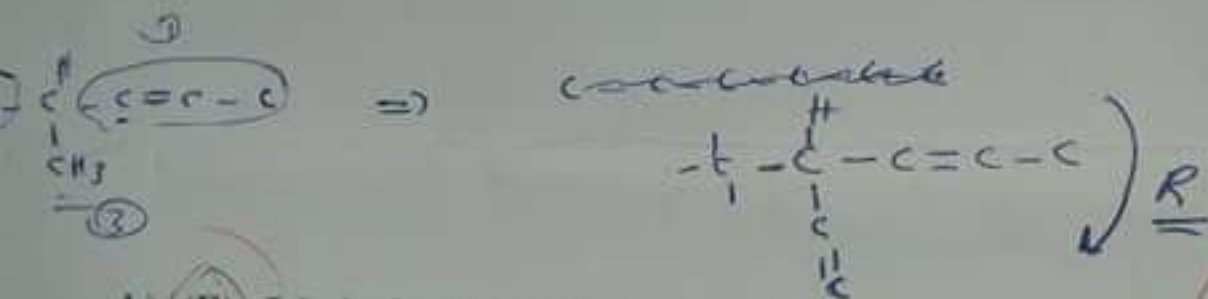
4- [✓] Rate of formation of carbocations follow the order $3^\circ > 2^\circ > 1^\circ > \text{CH}_3^+$

5- [X] E2 describes an elimination reaction in which the rate-determining step is unimolecular and does not involve the base. don't contain rate determining step

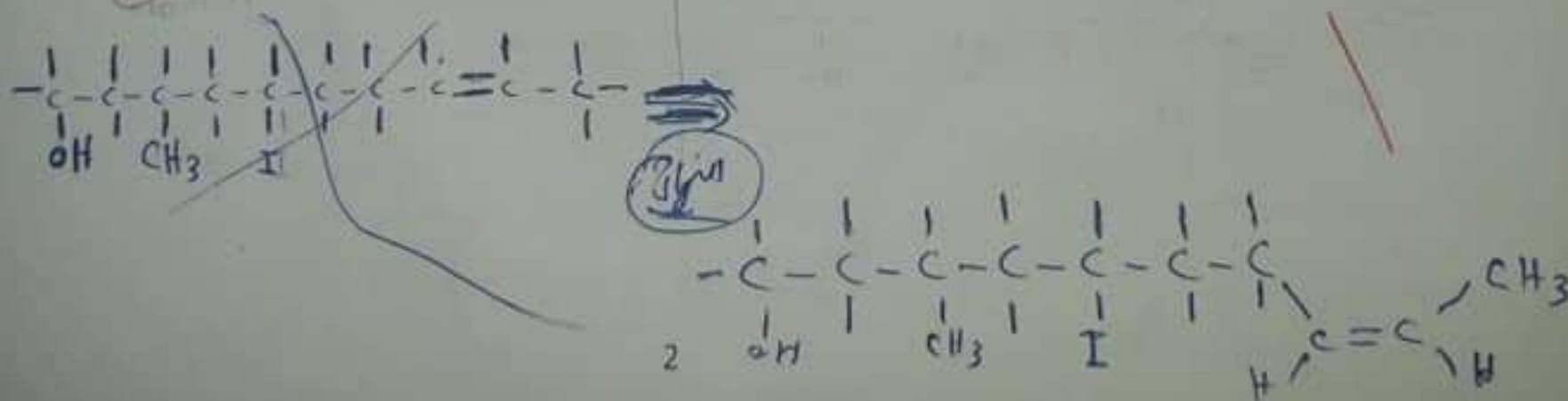
6- [✓] Mixture of equal parts of enantiomers is called racemic compound.

Q4) Draw the following: (4pts.)

a) (R)-3-methyl-1,4-hexadiene

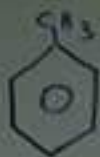


b) (E)-5-iodo-3-methyldec-8-ene-1-ol

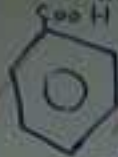


Q5) a) Which compound is more reactive toward electrophilic substitution:
(2pts.)

Toluene or benzoic acid

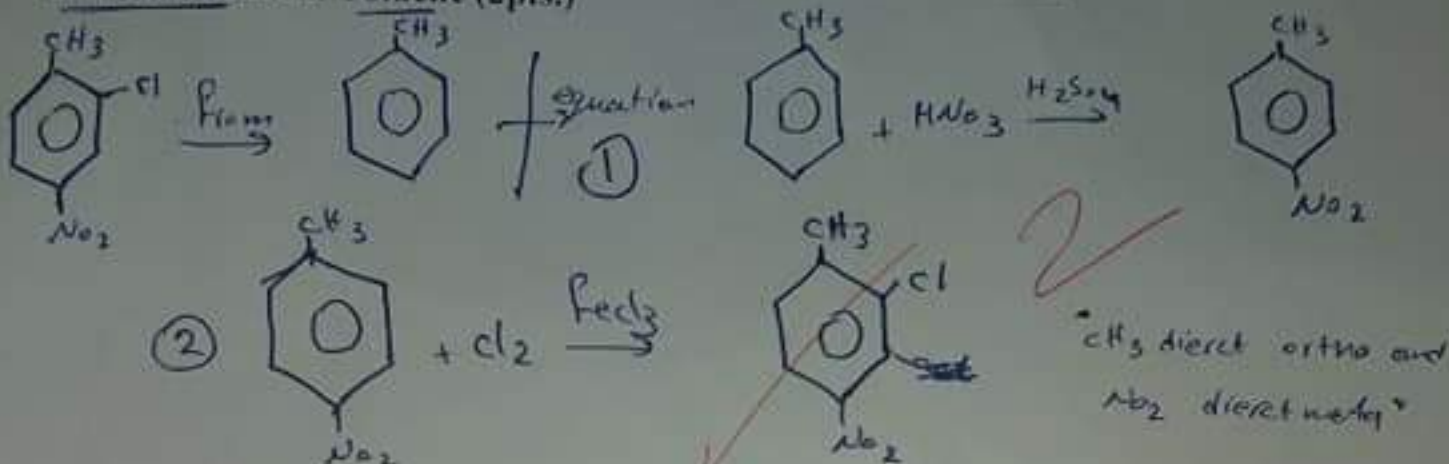


or



① the COOH withdraw e^- and destabilize the carbocation
② the CH_3 release e^- and stabilize the carbocation and activate Benzene cycle
the toluene is more reactive because the CH_3 group is activating and directs ortho and para but the COOH is deactivating and directs meta.

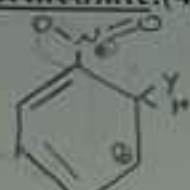
b) Using Chemical equations, show how can you prepare 2-chloro-4-nitrotoluene from Toluene (2pts.)



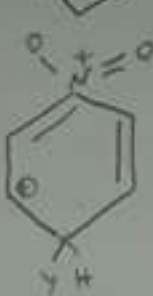
c) Nitrobenzene is deactivating group and meta directing. Explain using carbocation intermediate. (4pts.)



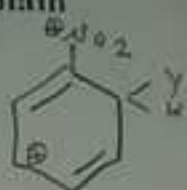
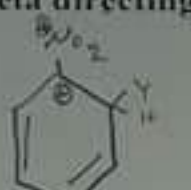
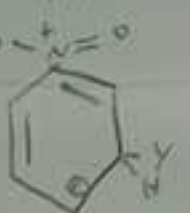
ortho



para



meta



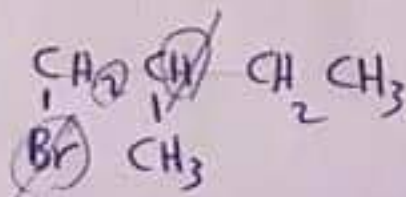
⊕ the NO_2 group when directs ortho and para because the positive charge of carbocation is adjacent to positive charge in (Nitrogen atom) they repel each other.

GOOD LUCK

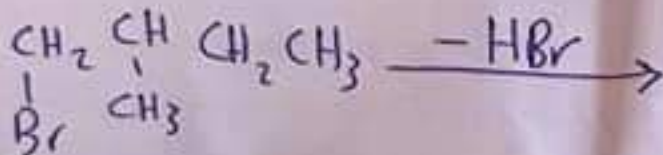
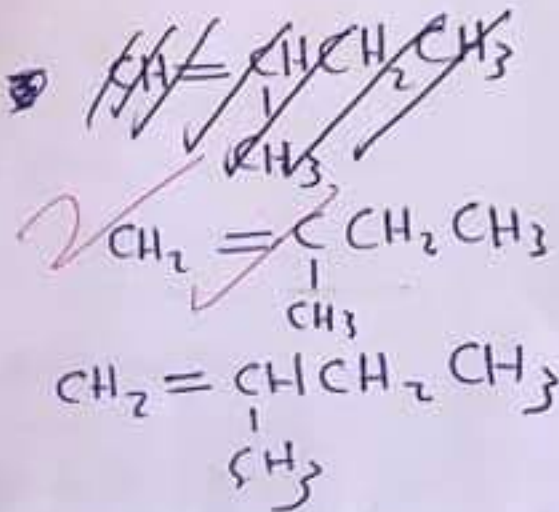
⊕ when the NO_2 directs meta the positive charge is away from the positive charge in N atom.

الاسم الطالب/ة: _____
الشعبة: _____

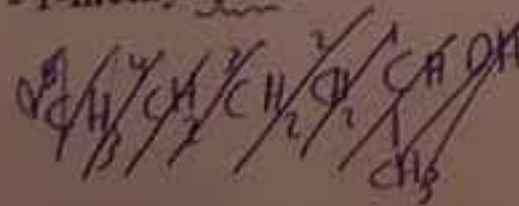
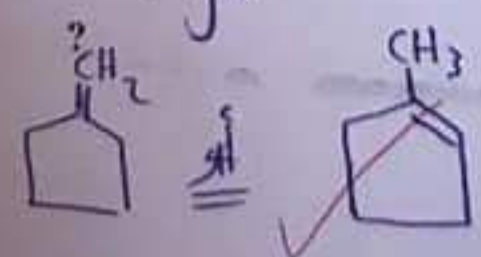
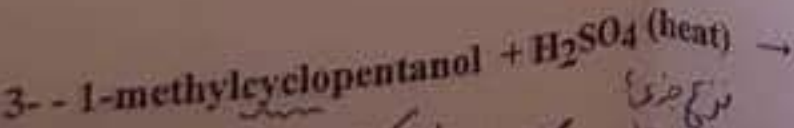
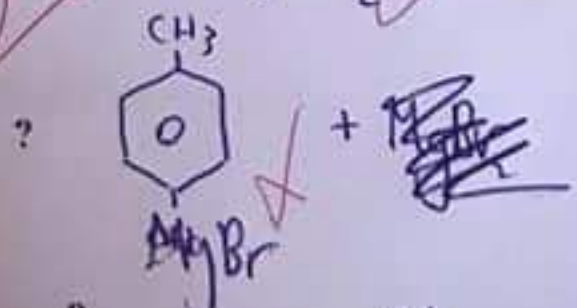
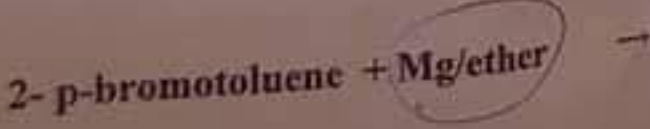
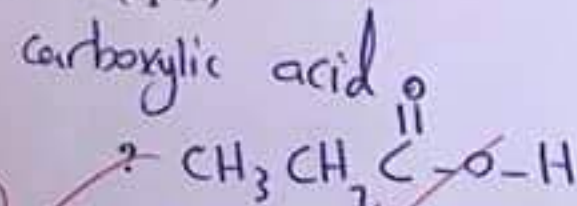
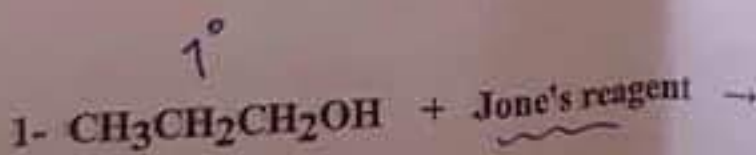
Q1) Give the structure of all the possible products (if any) when 1-bromo-2-methyl butane react by E2 mechanism, show the mechanism and tell which product is preferred and why? (5pts.)



E₂ mechanism
آلية E₂



Q2) Complete and draw each of the following equations: (3pts.)



Q3) Name and /or draw the structures of the following compounds (6pts.)

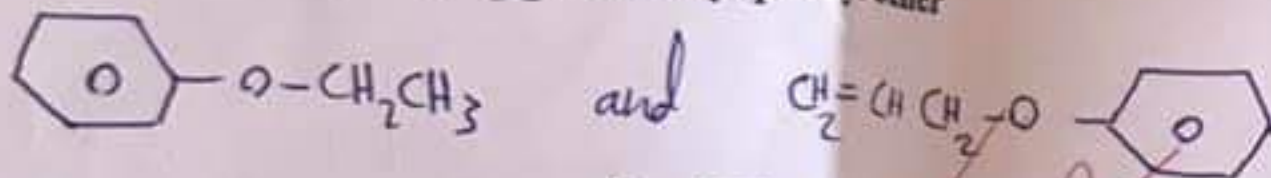
$ \begin{array}{ccccccc} 6 & 5 & 4 & 3 & 2 & 1 \\ \text{CH}_3 & & & & & \text{OH} \\ & \text{C} = \text{C} & & & & \text{C} \\ & & & & & \\ & & & & & \text{CH}_2\text{OH} \end{array} $ hexane-2,4-diene-1-ol	cyclohexene oxide
hexane-2,4-diene-1-ol	cyclohexene oxide
Ethylene glycol diethyl ether	2-cyclohexene-1-ol
$\text{CH}_3\text{CH}_2\text{CH}_2 - \text{O} - \text{CH}_2\text{CH}_2\text{CH}_3$	(S)-2-butenthio
2-ethoxy ethanol	(S)-2-butenthio
$ \begin{array}{c} 2 \quad 1 \\ \text{C} \quad \text{CH}_2\text{OH} \\ \quad \\ \text{OCH}_2\text{CH}_3 \end{array} $	$\text{CH}_3\text{CH}=\text{CHCH}_2\text{SH}$

Q4) Which of the following scientific statements are true and which are false? (5pts.)

- 1- ☒ E2 describes an elimination reaction in which the rate-determining step does not involve the base. substrate
- 2- ☒ Rate of formation of carbocations follow the order $3^\circ > 2^\circ > 1^\circ > \text{CH}_3^\circ$
- 3- ☒ Cyclohexanol is oxidized to ketone using PCC. Joh's reagent
- 4- ☒ Symmetric ethers are generally synthesized by dehydration of alcohols.
- 5- ☒ The $\text{S}_\text{N}1$ reaction occurs with inversion of configuration.

Q5) a) By chemical test, how can you distinguish between (Draw their structures): (2pts.)

Ethyl phenyl ether and allyl phenyl ether

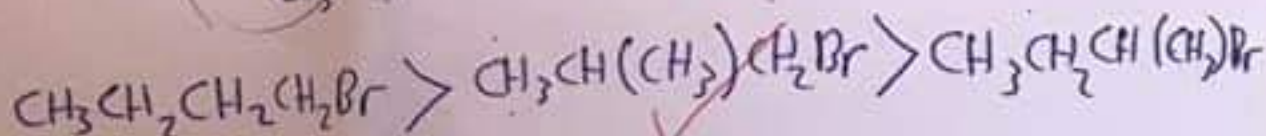
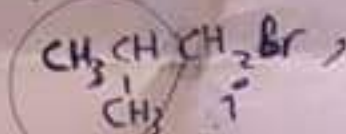
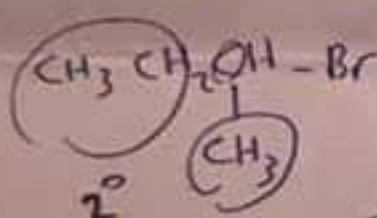
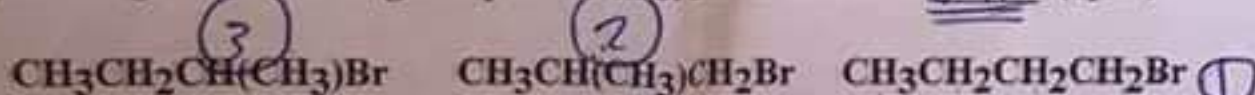


$\xrightarrow{Br_2/CCl_4}$ اللون الأحمر يختفي
المحلول يتحول إلى اللون الأصفر

b) Arrange the following in order of decreasing solubility in water (2pts.)

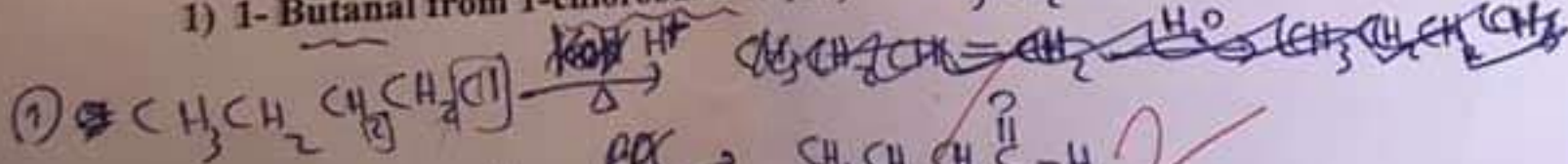
① Hexanol, ③ ethyl chloride, ② heptanol

c) Arrange the following compounds in order of decreasing S_N2 ? (2pts.) $1^\circ > 2^\circ > 3^\circ$

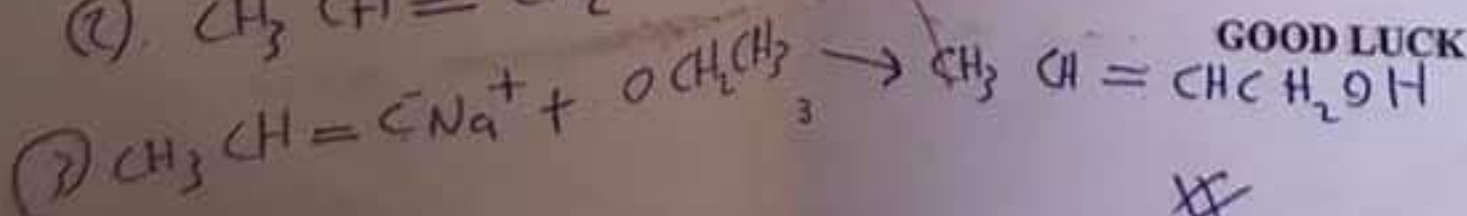
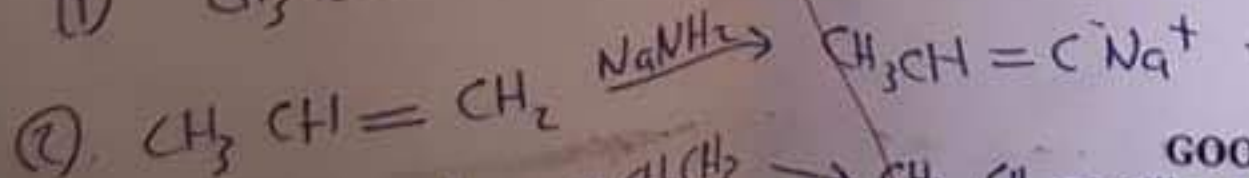
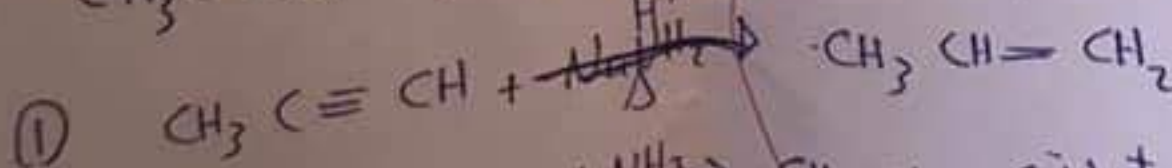
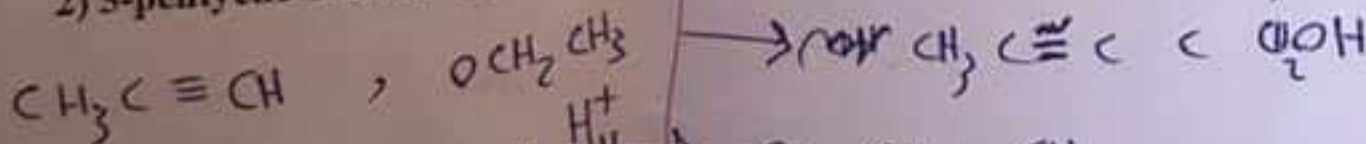


Q6) Using chemical equations, show how can you prepare:

1) 1-Butanal from 1-chlorobutane (2pts.) $CH_3CH_2CH=CH_2$



2) 3-pentyne-1-ol using propyne and ethylene oxide (3pts.)



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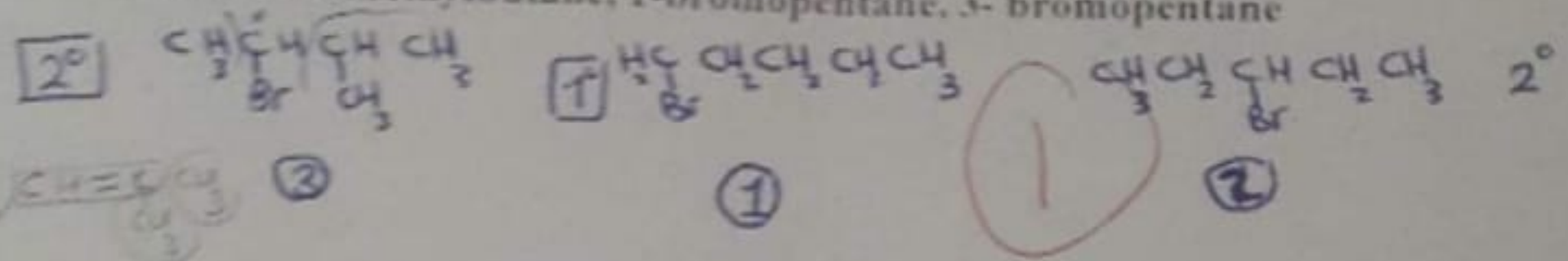
#

اسم الطالب/ة

Answer the following questions:

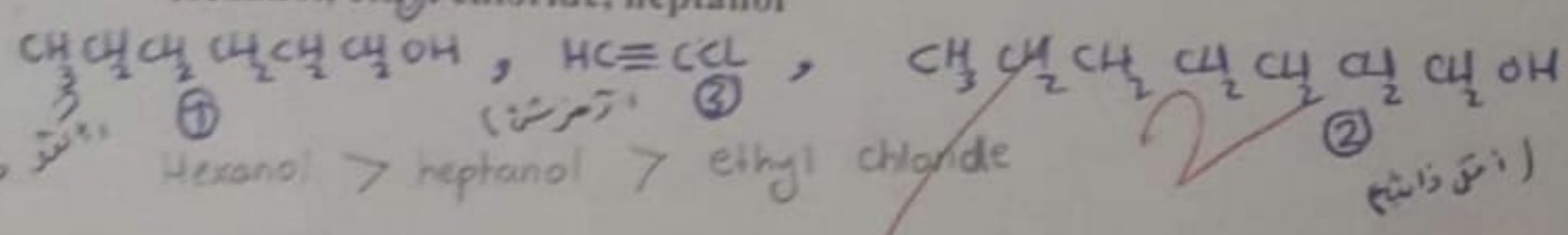
Q1) a) Arrange in order of reactivity toward dehydrohalogenation? (2pts.)

2-bromo-3-methylbutane, 1-bromopentane, 3-bromopentane



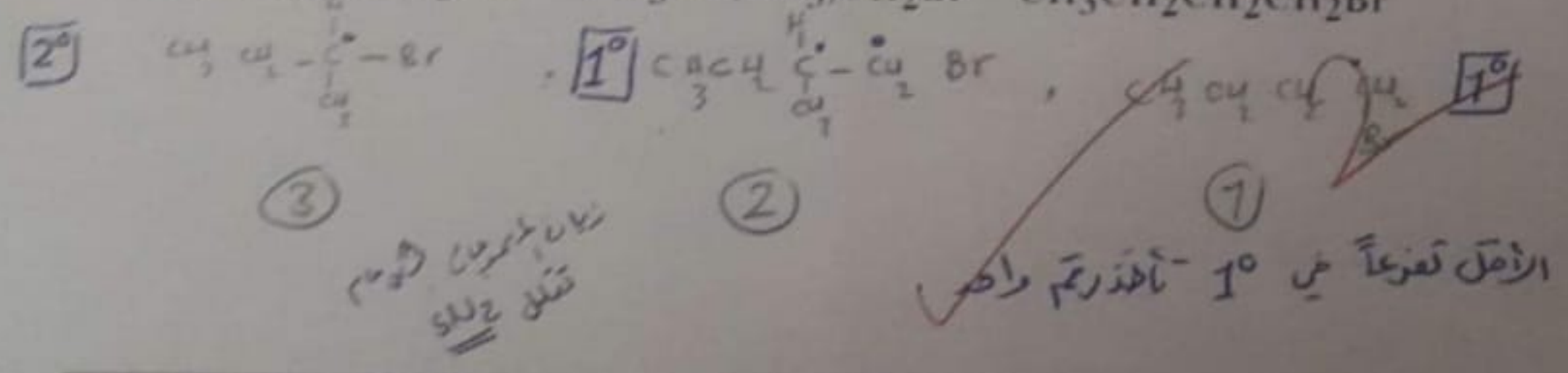
b) Arrange the following in order of decreasing solubility in water? (2pts.)

Hexanol, ethyl chloride, heptanol



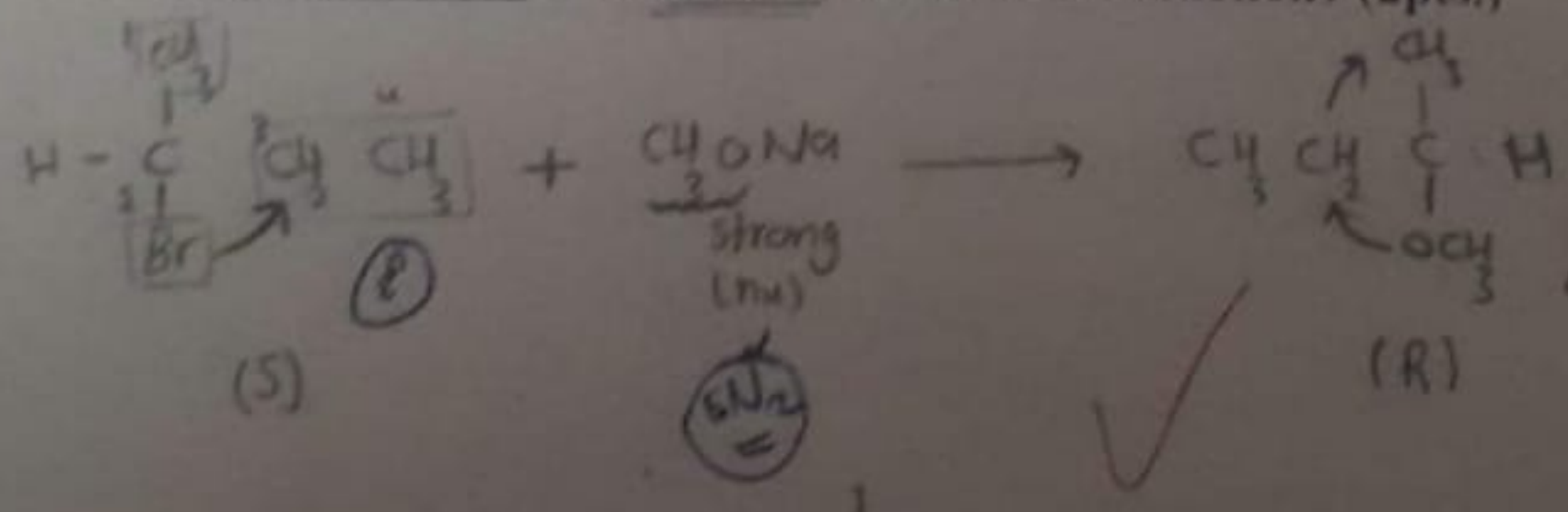
c) Arrange the following compounds in order of decreasing S_N2 ? (2pts.)

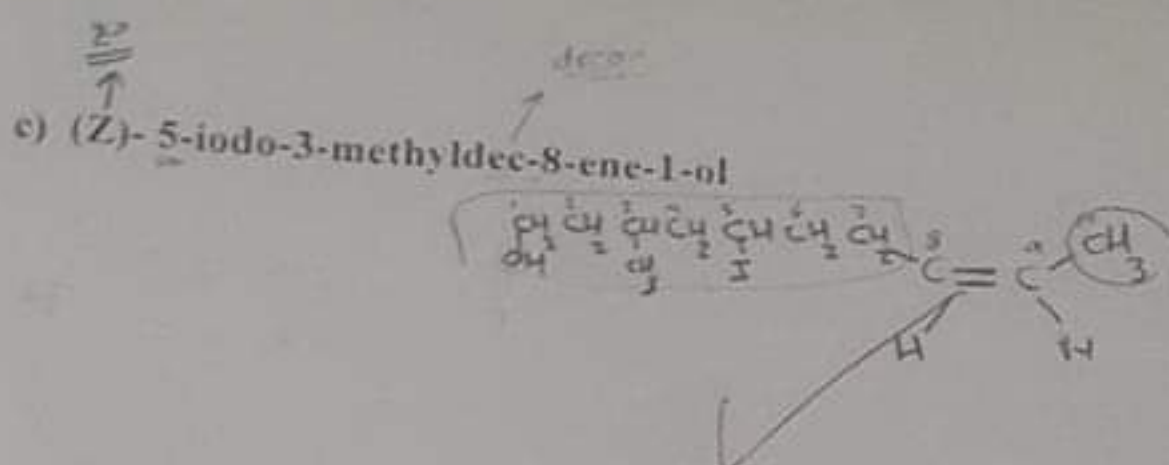
CH3CH2CH(CH3)Br CH3CH(CH3)CH2Br CH3CH2CH2CH2Br



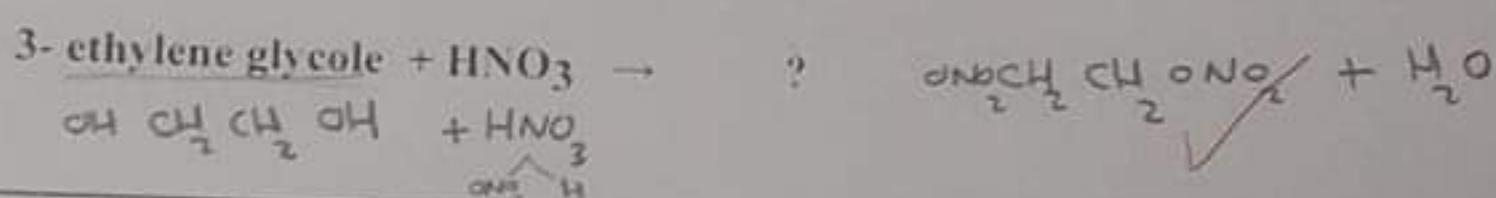
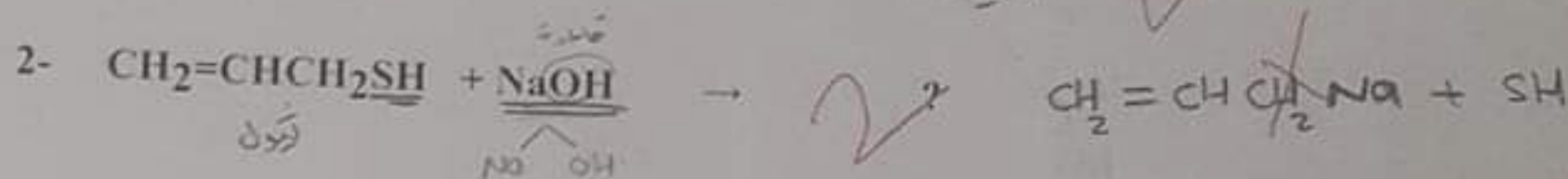
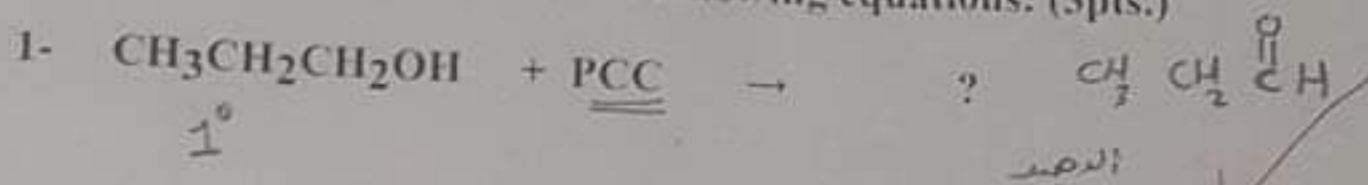
Q2) a) If (S) -2-bromobutane reacts with CH3ONa (strong nucleophile):

1- Write and draw the two sides of the above reaction? (2pts.)



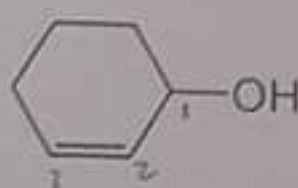


Q5) Complete and draw each of the following equations: (3pts.)



Q6) Name the following compounds: (3pts.)

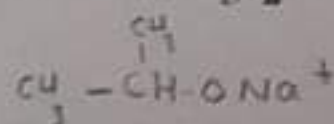
a)



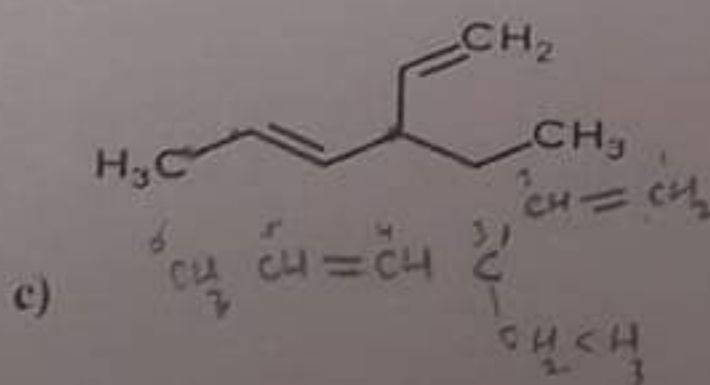
2-cyclohexene-1-ol

3

b) $(\text{CH}_3)_2\text{CHO}-\text{Na}^+$



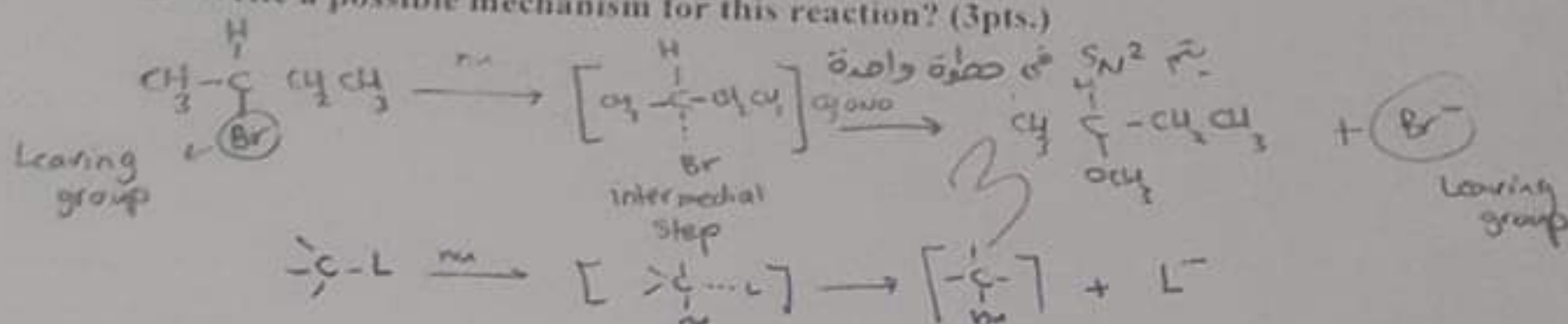
Sodium isopropoxide



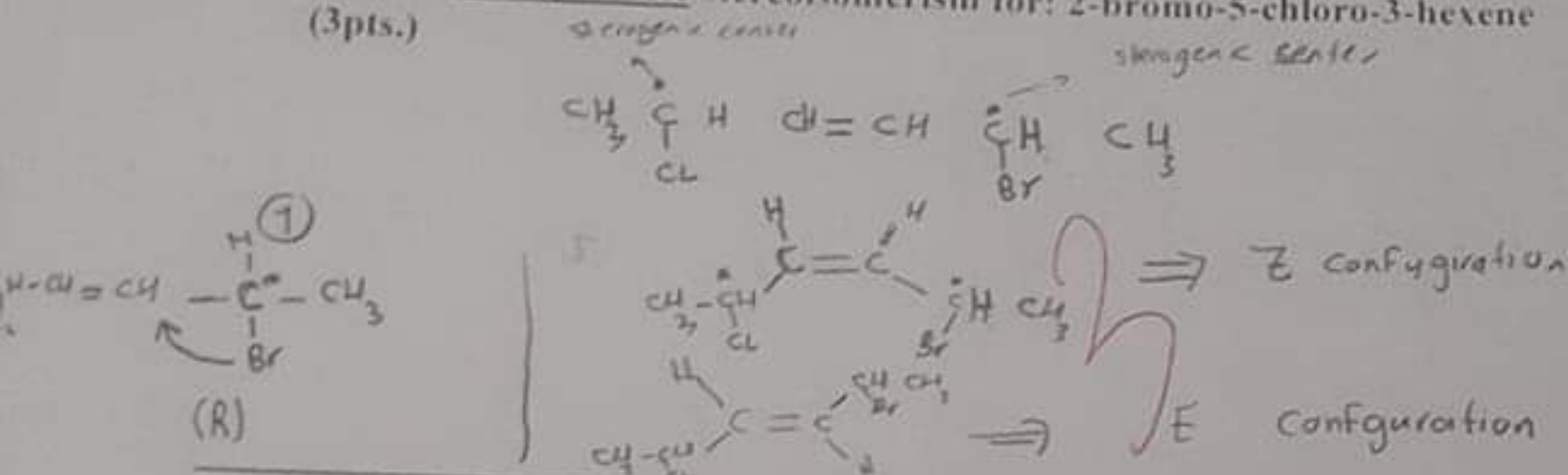
3 ethyl -1,4- hexadien

GOOD LUCK

2- Write a possible mechanism for this reaction? (3pts.)



3- Draw all the possible stereoisomerism for: 2-bromo-5-chloro-3-hexene (3pts.)

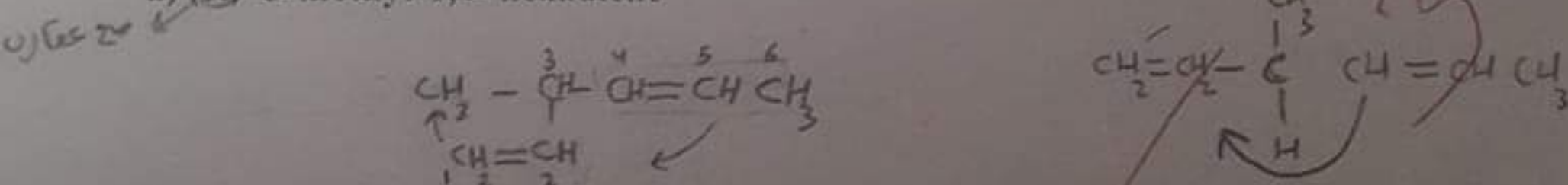


Q3) Which of the following scientific statements are true and which are false? (7pts.)

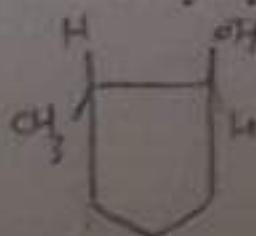
- [F] Configuration means rotation about single bond double bond
- [T] In S_N2 reaction, Rate depends on nucleophile concentration.
- [T] In acid dehydration of 2-methyl-2-butanol, the major product is 2-methyl-2-butene.
- [T] Rate of formation of carbocations follow the order $3^\circ > 2^\circ > 1^\circ > \text{CH}_3^+$
- [F] E2 describes an elimination reaction in which the rate-determining step does not involve the base.
- [T] Cyclohexanone is oxidized to an ketone using Jone's reagent.
- [F] Mixture of equal parts of enantiomers is called chiral center.

Q4) Draw the following: (3pts.)

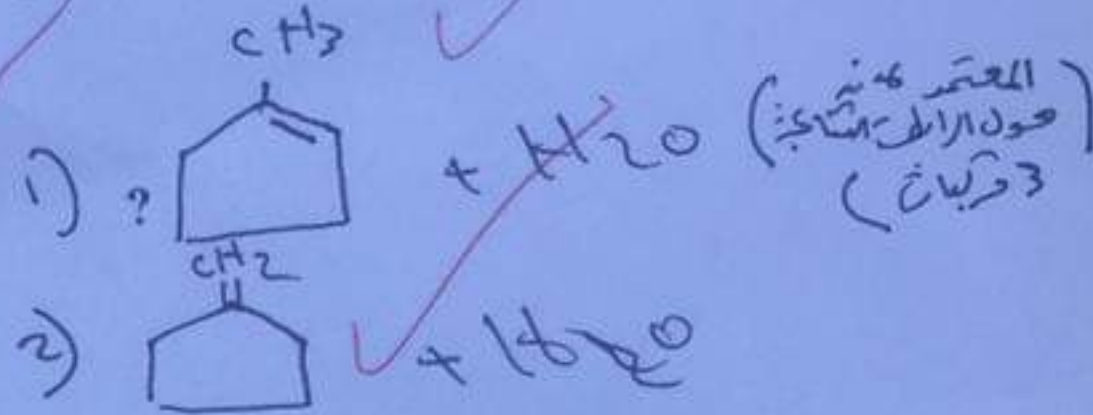
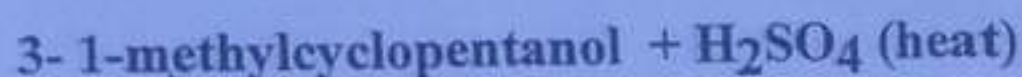
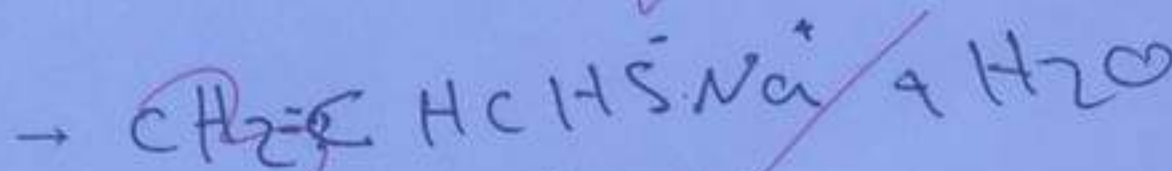
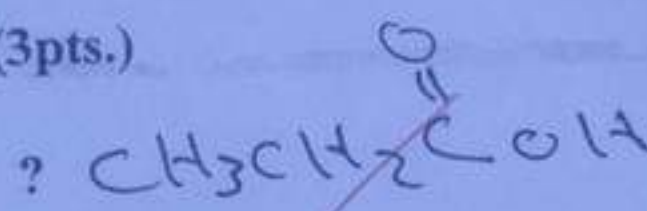
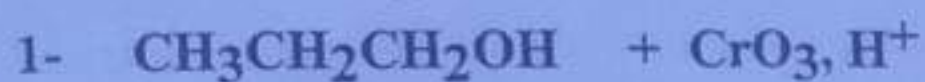
a) (R) -3-methyl-1,4-hexadiene



b) trans-2-methylcyclopentanol

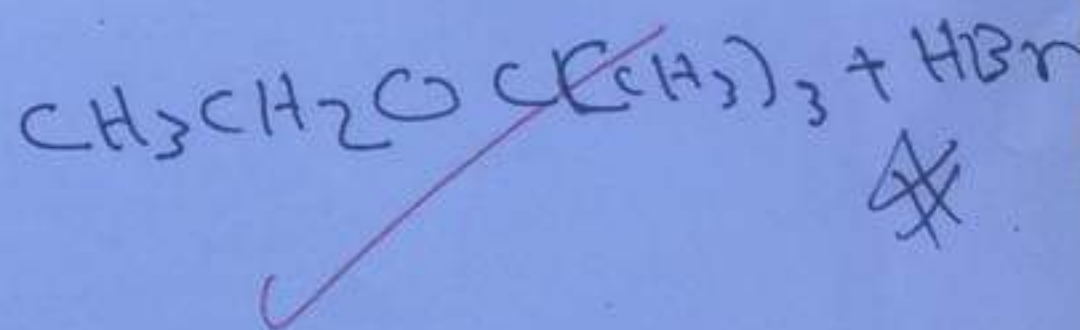
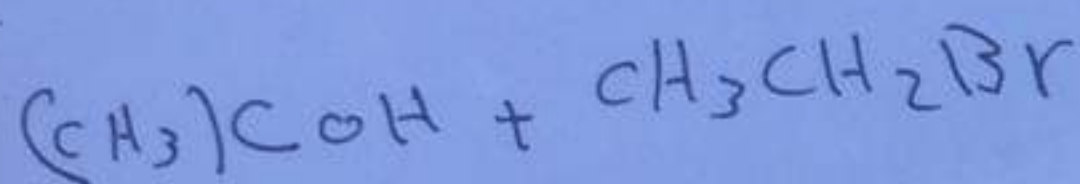
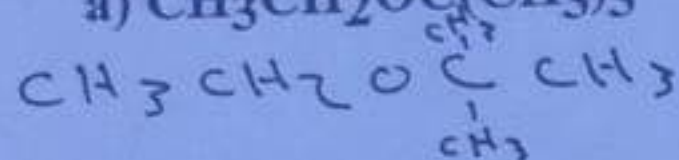


Q5) Complete and draw each of the following equations: (3pts.)

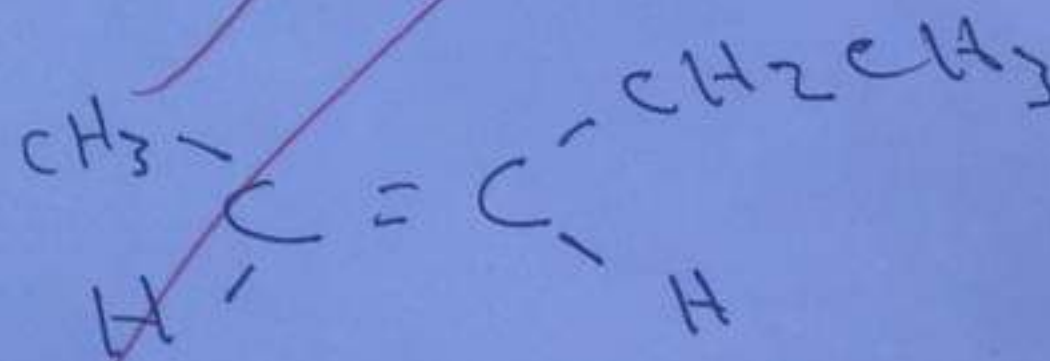
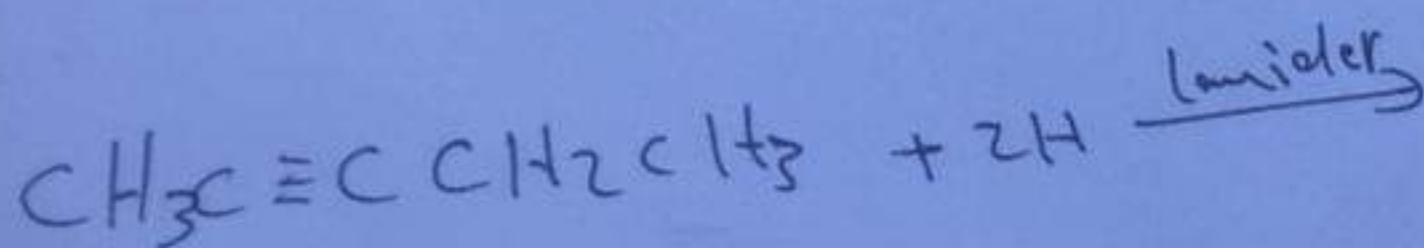
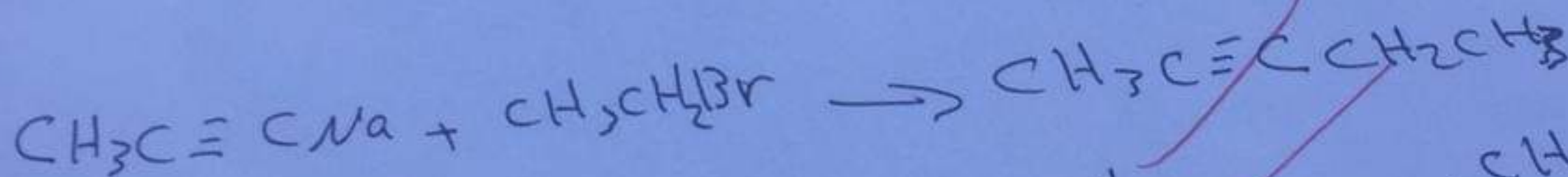
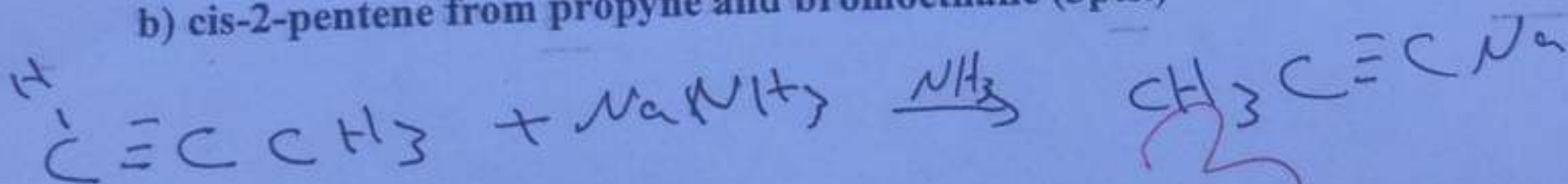


Q6) Using chemical equations, show how can you prepare:

a) $\text{CH}_3\text{CH}_2\text{OC}(\text{CH}_3)_3$ (2pts.)

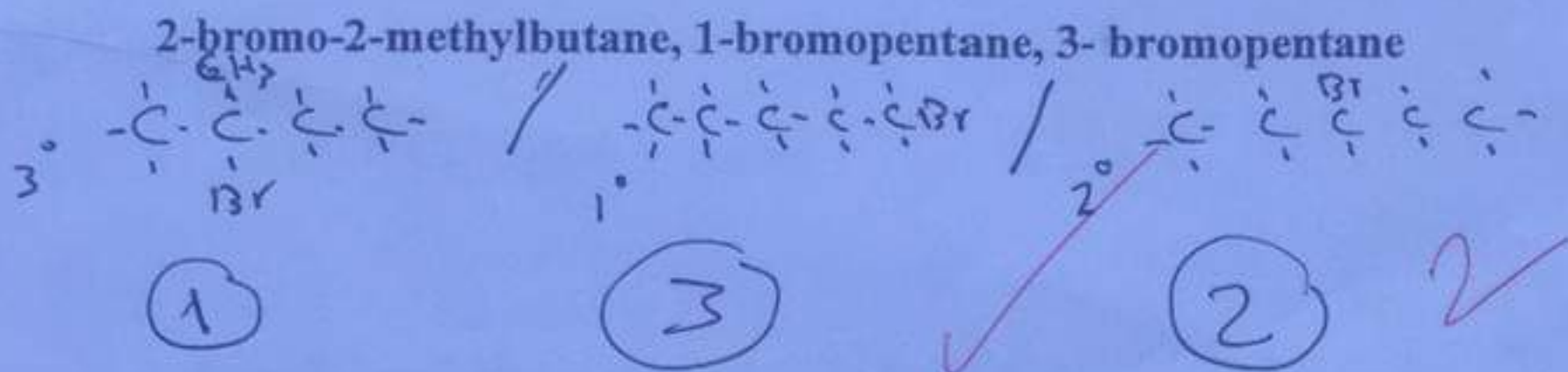


b) cis-2-pentene from propyne and bromoethane (3pts.)

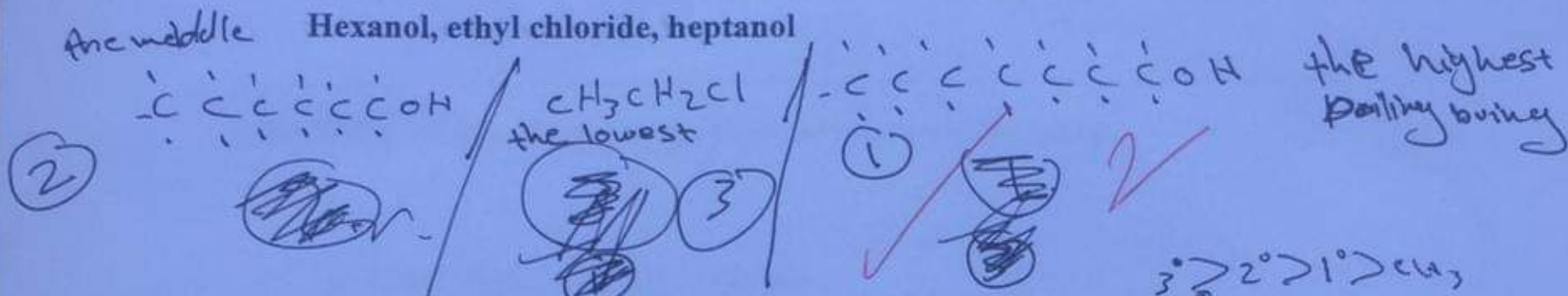


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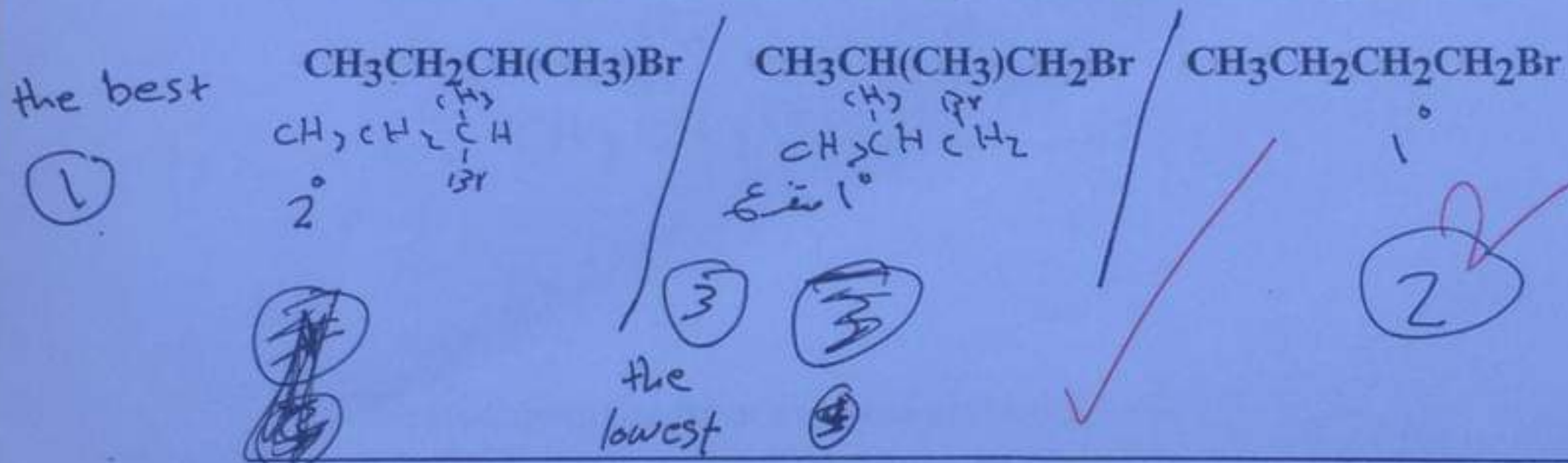
Q3) a) Arrange in order of reactivity toward dehydrohalogenation? (2pts.)



b) Arrange the following in order of decreasing Boiling point (2pts.)

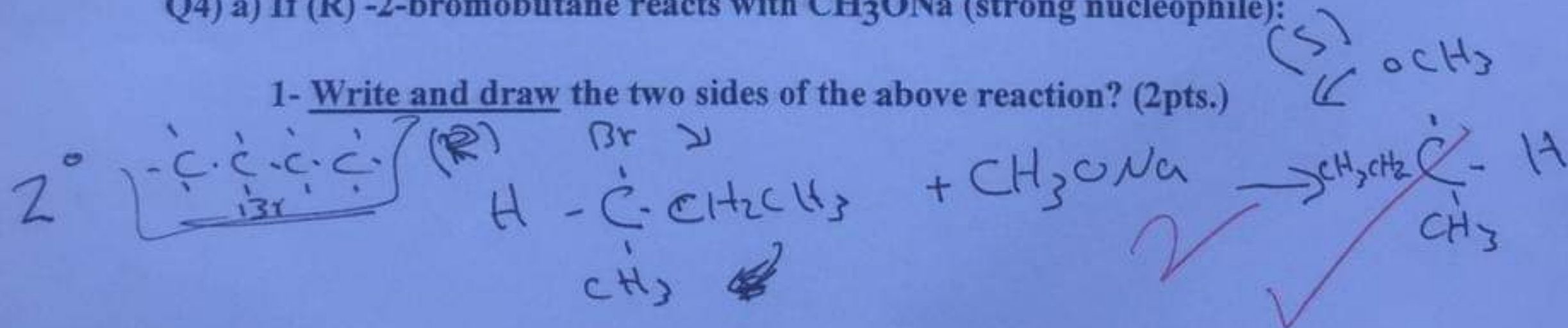


c) Arrange the following compounds in order of decreasing $\text{S}_\text{N}1$? (2pts.)

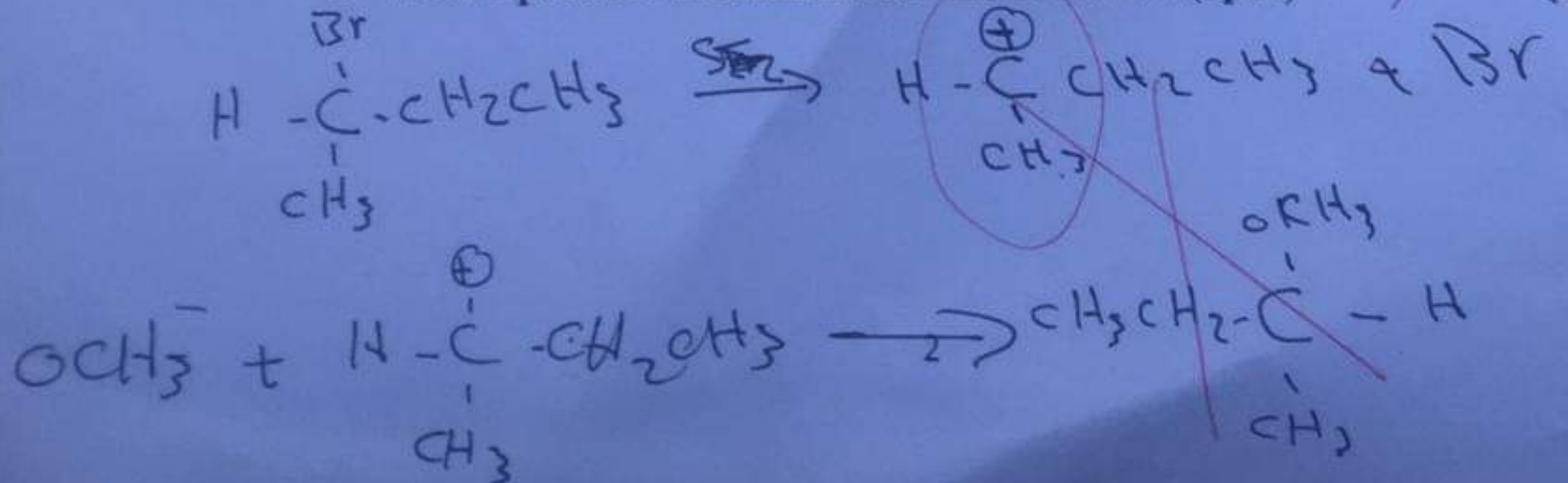


Q4) a) If (R) -2-bromobutane reacts with CH_3ONa (strong nucleophile):

1- Write and draw the two sides of the above reaction? (2pts.)



2- Write a possible mechanism for this reaction? (3pts.)



25/30

Al-Azhar University-Gaza

Organic Chemistry for Dentistry

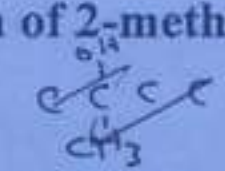
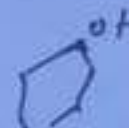
Chemistry Department

2nd Mid-Term Exam.

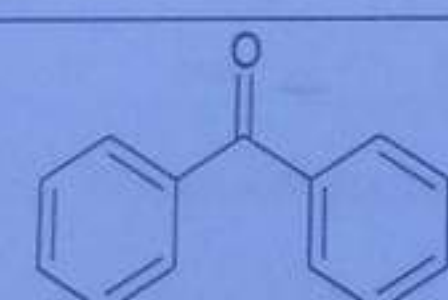
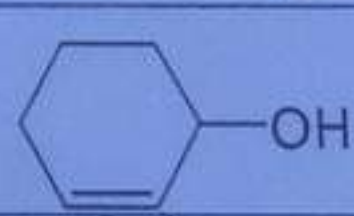
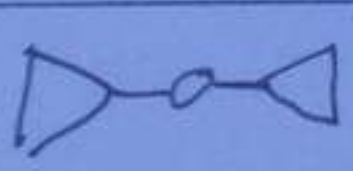
Prof. Dr. Omar Khader Melad (1A) 17/12/2018

Answer the following questions:

Q1) Which of the following scientific statements are true and which are false? (5pts.)

- 1- [F] Asymmetric ethers are generally synthesized by dehydration of alcohols.
- 2- [T] The S_N2 reaction occurs with inversion of configuration.
- 3- [T] In acid dehydration of 2-methyl-2-butanol, the major product is 2-methyl-2-butene. 
- 4- [T] E1 describes an elimination reaction in which the rate-determining step does not involve the base.
- 5- [T] Cyclohexanol is oxidized to an aldehyde using PCC. 

Q2) Name and /or draw the structures of the following compounds (6pts.)

	
diphenyl ether	cyclohexanone
Dicyclopropyl ether	
	2-cyclohexen-1-ol
Potassium isopropoxide	2-isopropyl-5-methyl phenol
