

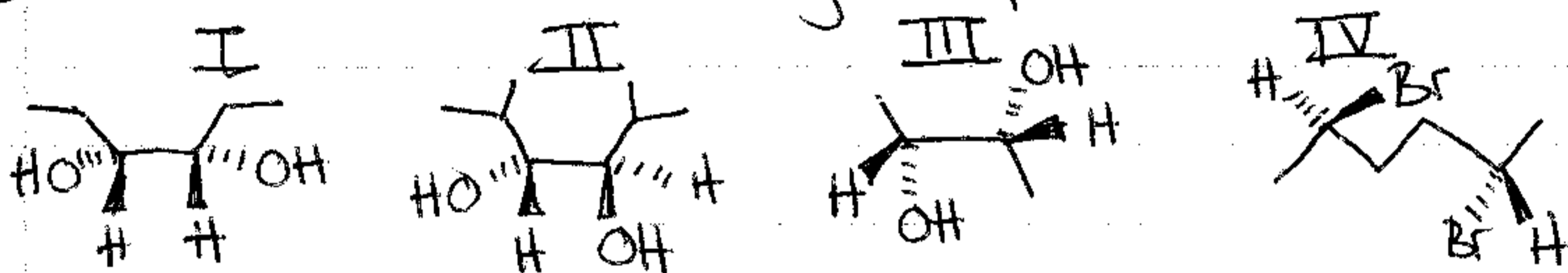
Organic Chemistry I: Exam 2 fall '05

① The total # of asymmetric carbons for the following molecules is:



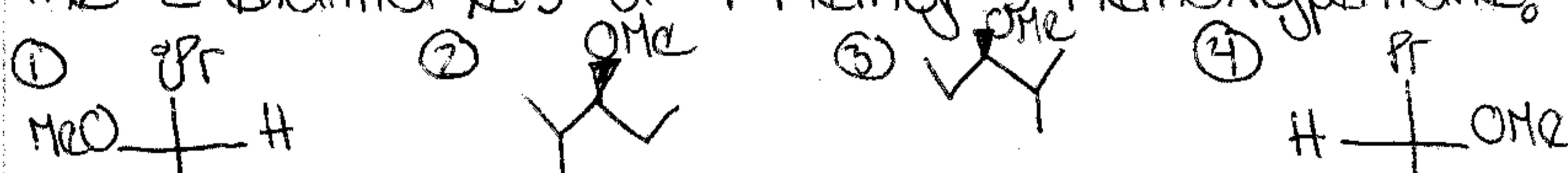
- a) 1 **b) 2** c) 3 d) 4 e) 0

② Which of the following compounds are meso?



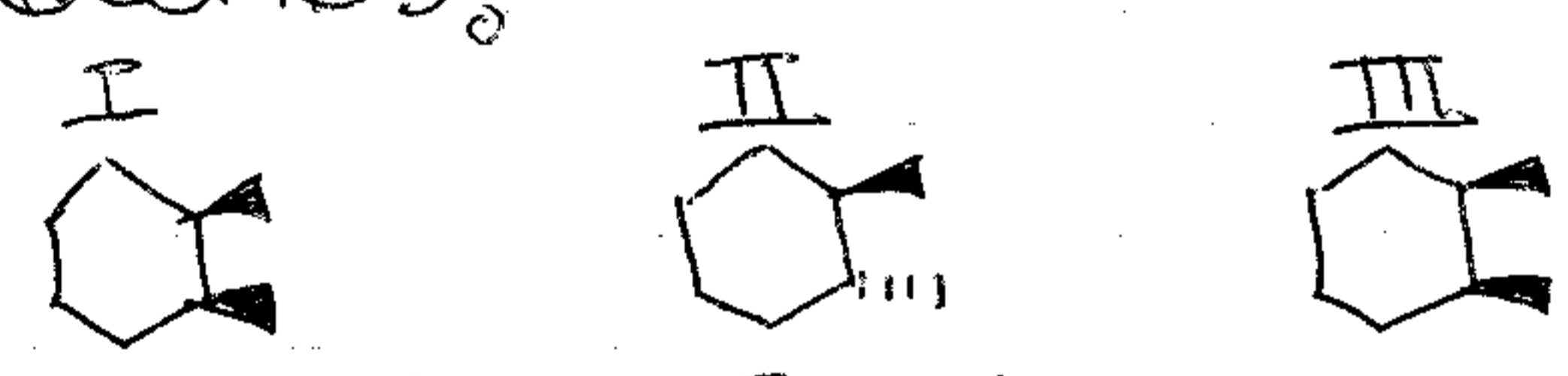
- a) I, II, and III d) I and III
 b) I and II e) II and III
c) I and IV

③ Which of the structures below corresponds to the Z enantiomers of 4-methyl-3-methoxypentane?



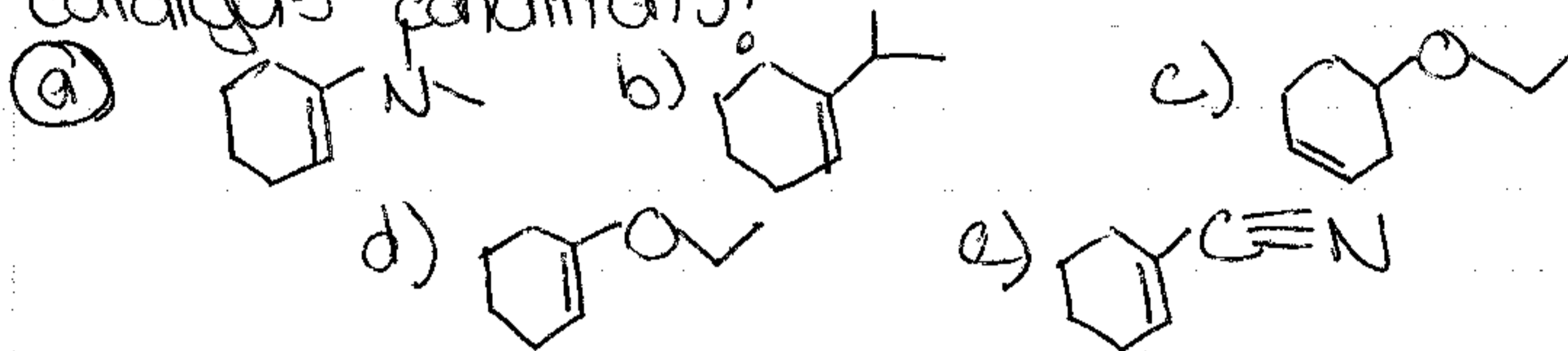
- a) 1 & 2** b) 2 & 4 c) 3 & 2 d) 1 & 4

④ Which of the following molecules are diastereomers?



Answers: I & II, I and III

6) which of the following molecules will be more reactive towards addition of H_2O under acid catalysis conditions?



7) what is the IUPAC name of the following molecule:

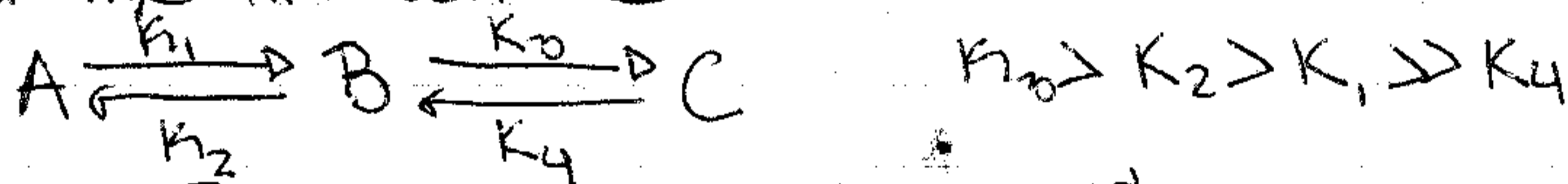


Answer: (Z, Z)-2-chloro-4-methyl-3-heptene

8) which of the following alkynes will provide an aldehyde through a hydroboration oxidation reaction sequence?



9) for the rxn scheme:



- a) the 1st step is endo. & the 2nd is exo.
 b) both steps are exo.
 c) both steps are endo.
 d) the 1st step is exo. & the 2nd is endo.

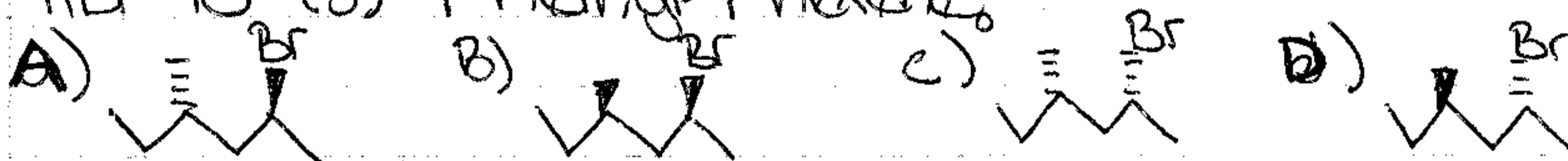
10) which energy diagram corresponds to a rxn in which an intermediate would build up to a significant concentration



10) which of the following molecules can form a 6-membered ring alkyl chloride upon rxn w/ HCl in CH_2Cl_2 (Hint: writing the rxn mech. helps!)

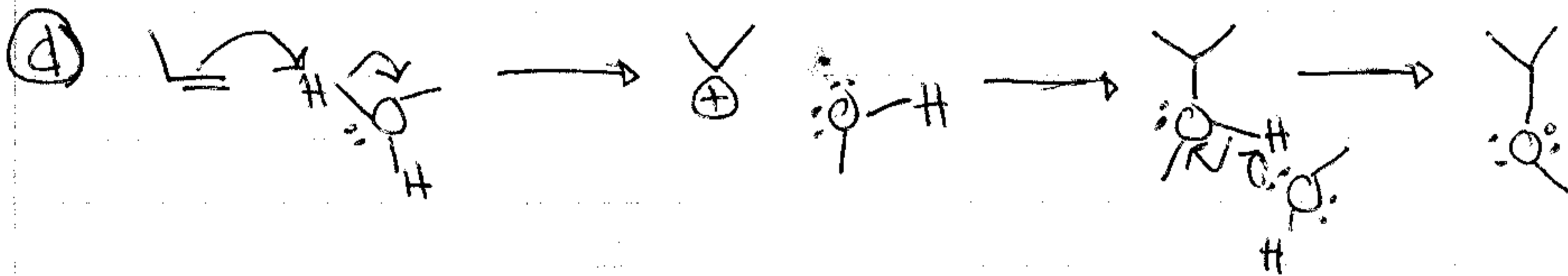
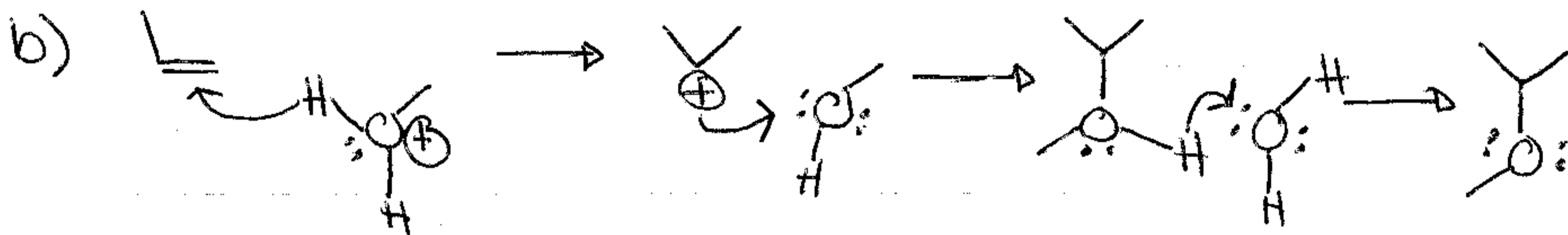
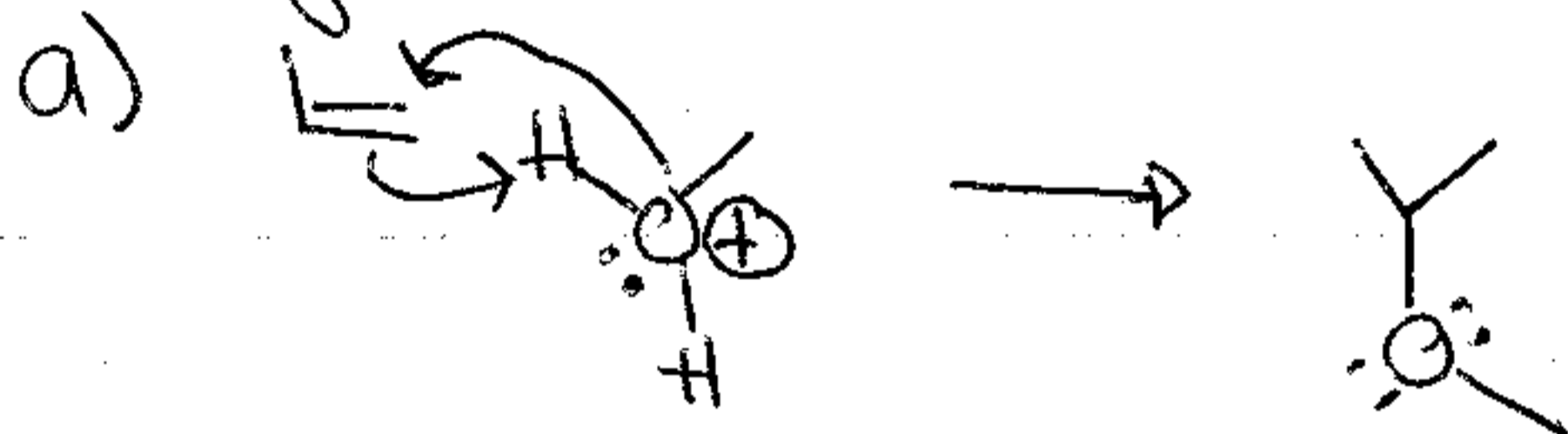


11) which products are obtained upon addition of HBr to (S)-4-methyl-1-hexene?

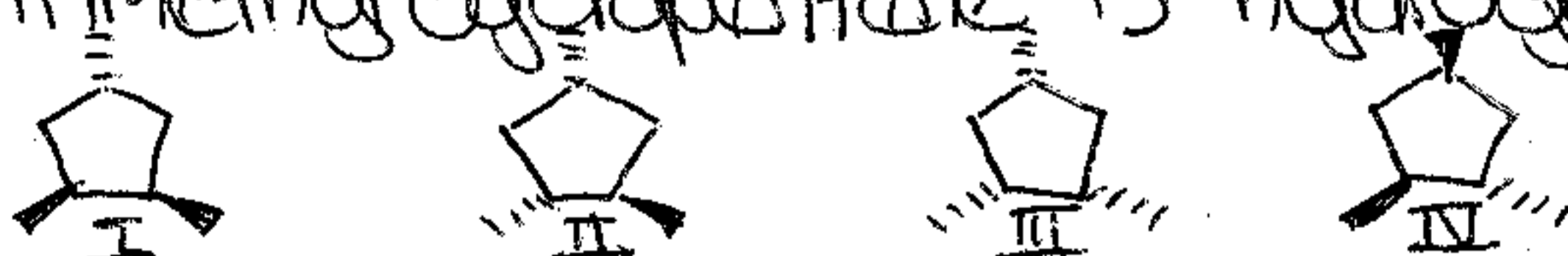


a) A & B b) A & C c) B & C d) B and D

12) what is the proper e^- mechanism for the acid catalyzed addition of methanol to an alkene?

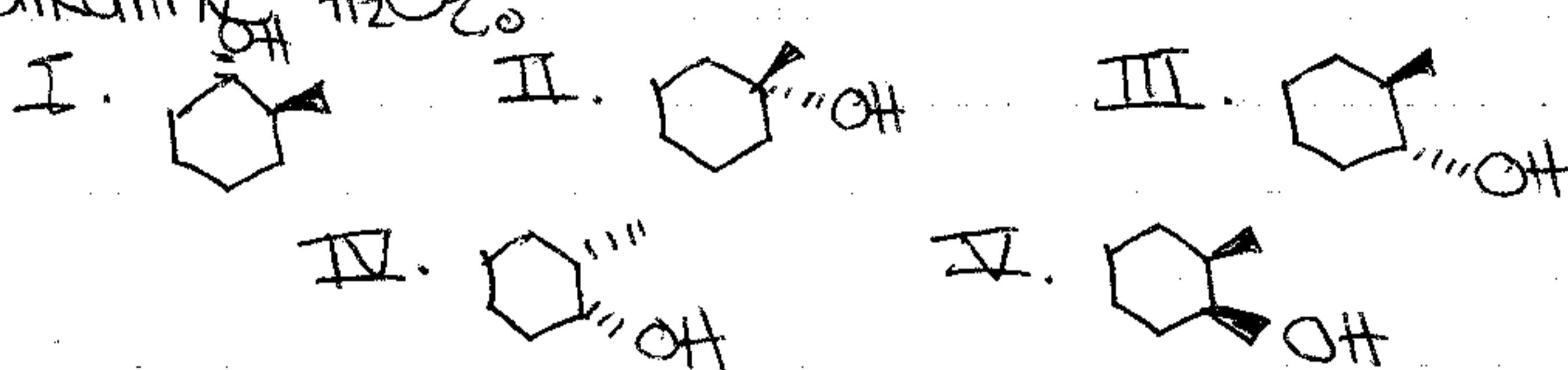


13) which of the following products is formed when 1,2,4-trimethylcyclopentene is hydrogenated?



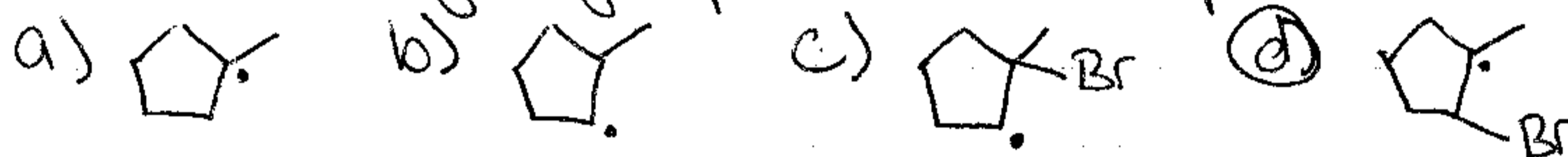
a) I b) I & III c) II d) II & IV

14) what is the product of a rxn of methylcyclohexane with BH_3 in THF followed by oxidation with alkaline H_2O_2 ?

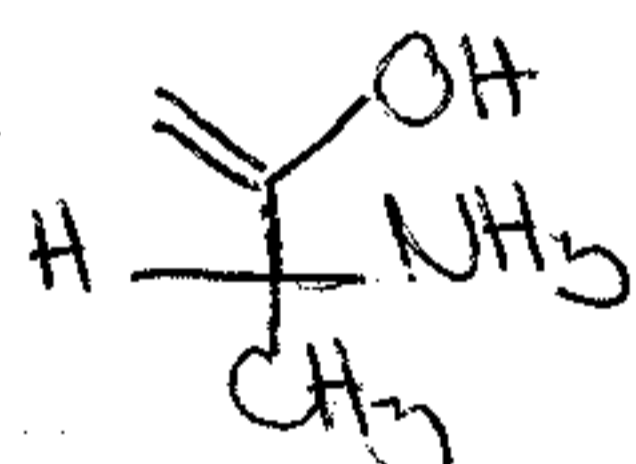


a) I & III b) II c) III & IV d) IV & V

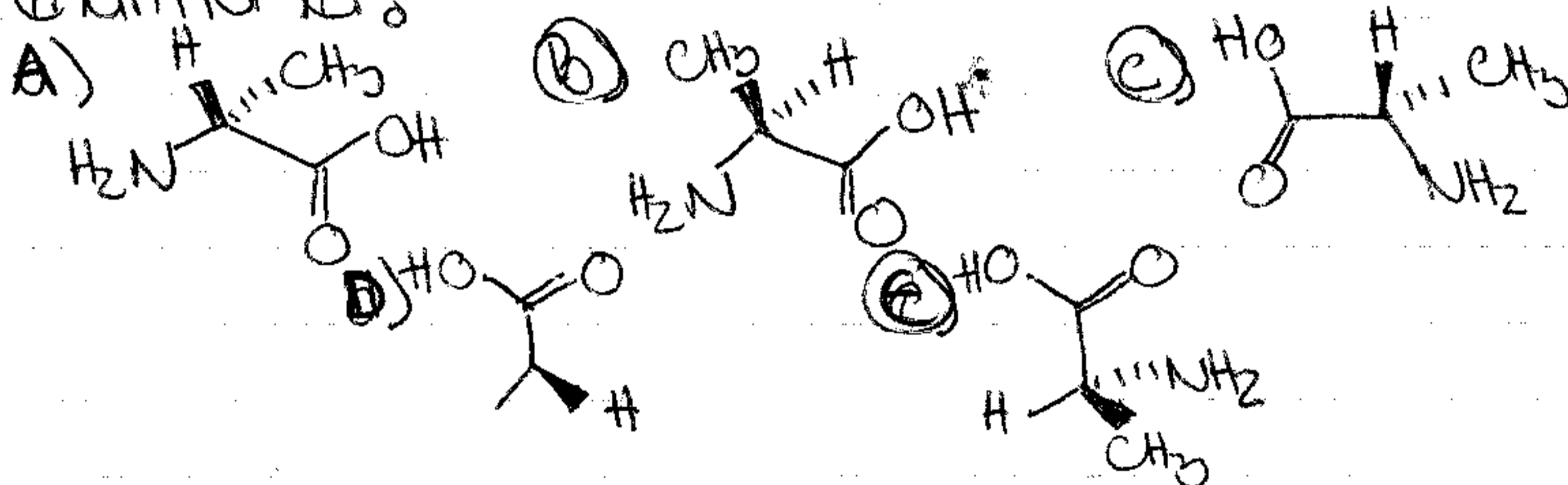
15) which is the correct structure of the radical formed as an intermediate in the addition of HBr to methylcyclopentene in the presence of H_2O_2 ?



16) consider the following Fischer projections of the amino acid alanine.

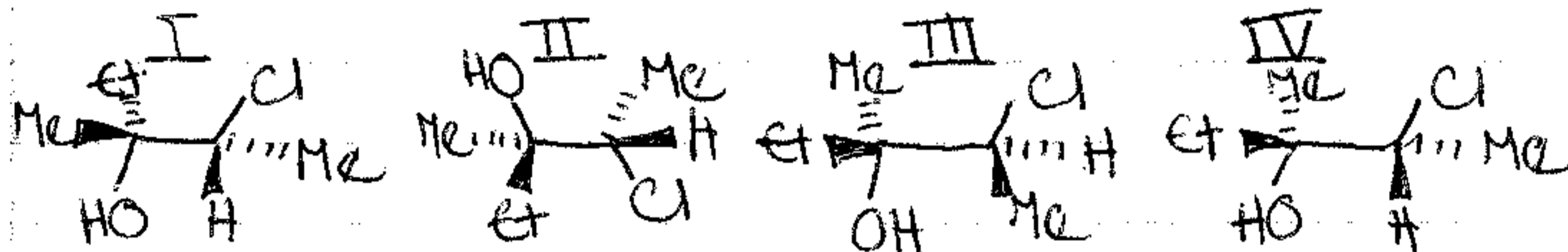
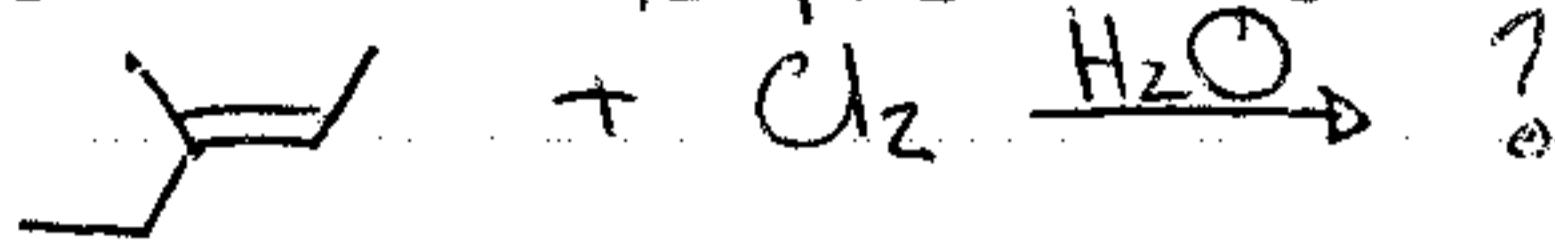


which of the structures below represent its enantiomer?



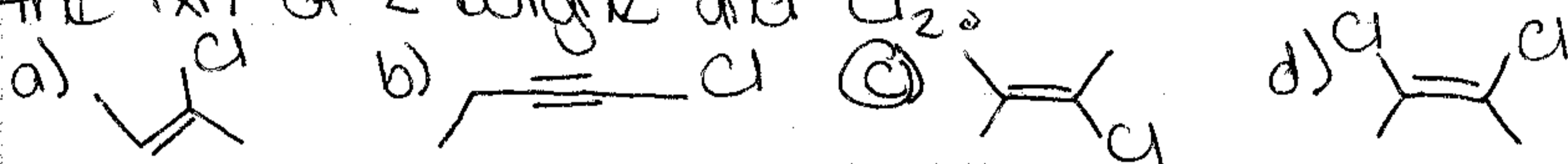
Answer: BCE

17) which are the products of the following rxn?



- a) I & II b) I & III c) II & III d) I & IV **e) II & IV**

18) what would be the expected product obtained from the rxn of 2-butyne and Cl_2 ?

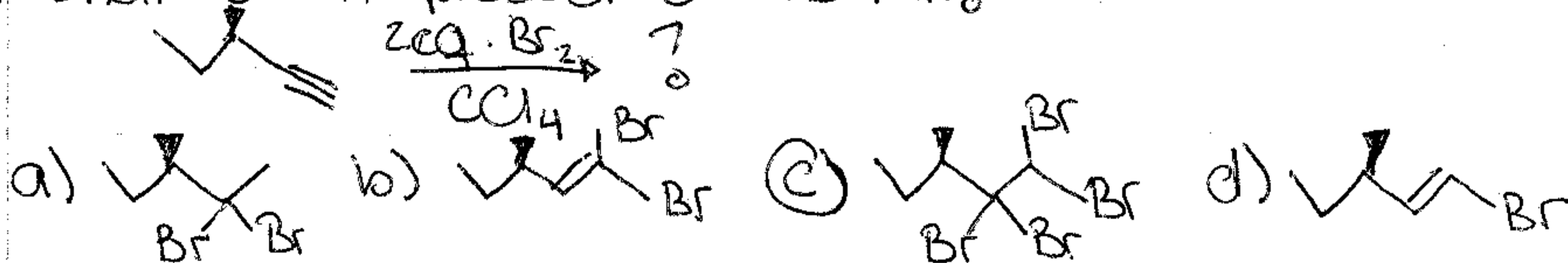


19) Indicate the rxns (in the correct forward order) required to convert 1-hexyne into 1-hexanol.

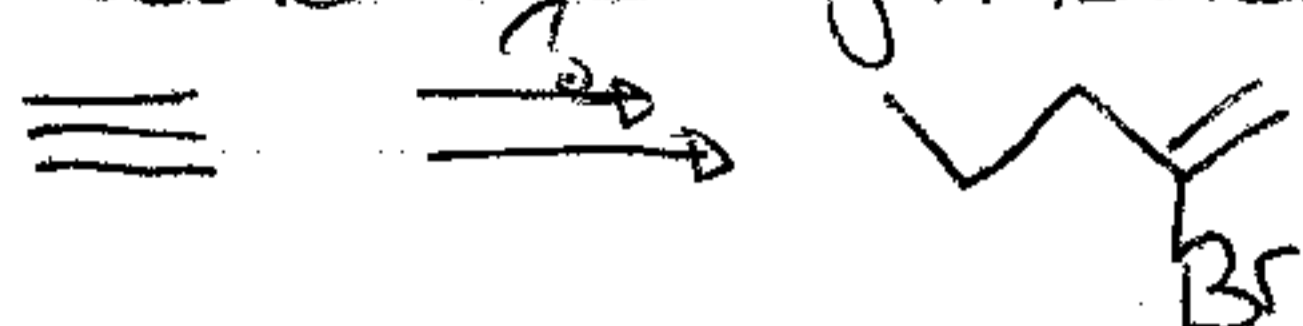
- a) $\text{Br}_2 / \text{CCl}_4$
 b) HBr , ether
 c) $\text{Br}_2 / \text{H}_2\text{O}$
 d) NaNH_2 , H_2O
 e) H_3O^+
 f) BH_3 / THF then alkaline H_2O_2
 g) H_2 , Lindlar catalyst
 h) Na / NH_3 then NH_4Cl

- a) e & g b) B & F **c) G & F** d) H & D e) H & E

20) what is the product of the rxn?

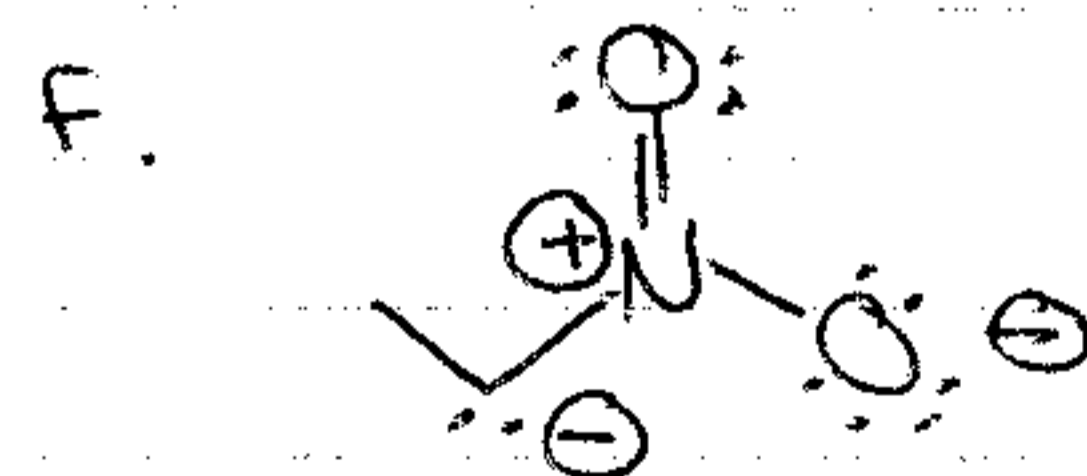
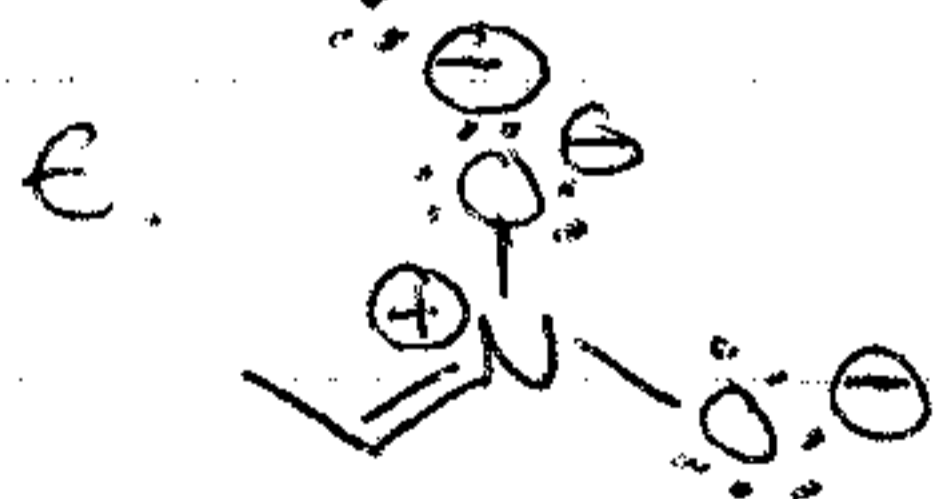
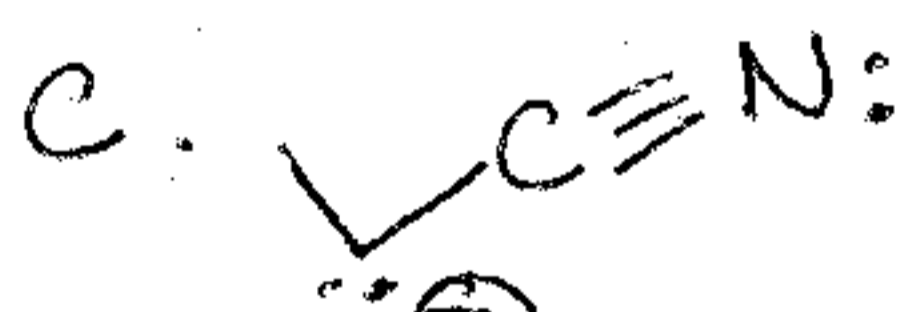
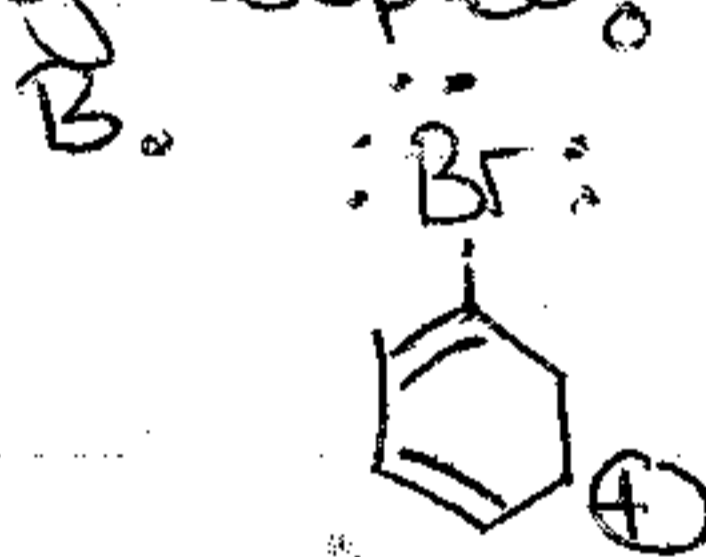
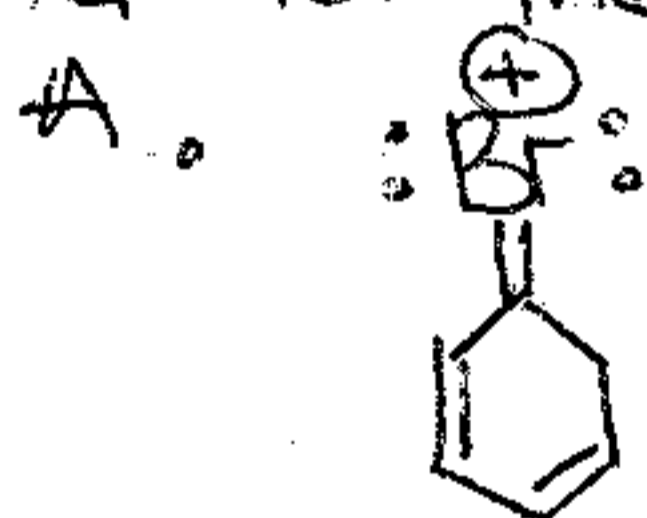


21) How would one synthesize the following compound?



- a) 1. NaNH₂, mineral oil, heat
 2. 1 eq. PrCl, DMF
 3. HBr (1 eq.) CH₂Cl₂
- b) 1. NaH, DMF
 2. 1 eq. iPrCl, DMF
 3. HBr (2 eq.) CH₂Cl₂
- c) 1. EtONa, EtOH
 2. HBr, H₂O
 3. CH₃CH₂CH₂Br, DMF
- d) 1. NaNH₂
 2. PrCl, DMF
 3. HBr, peroxide

22) Which of the following resonance contributors makes the greater contribution to the resonance hybrid for the following couples?



a) ADE

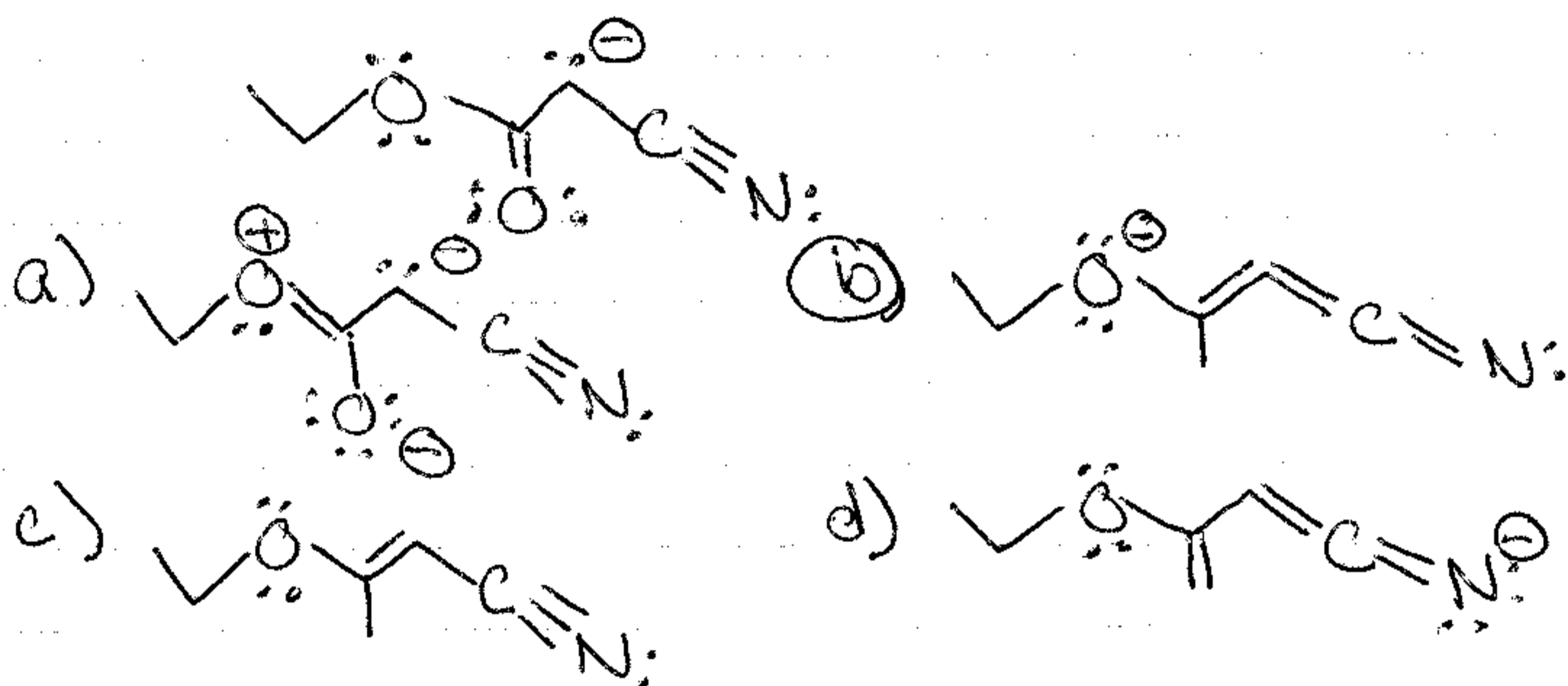
b) ACE

c) BCE

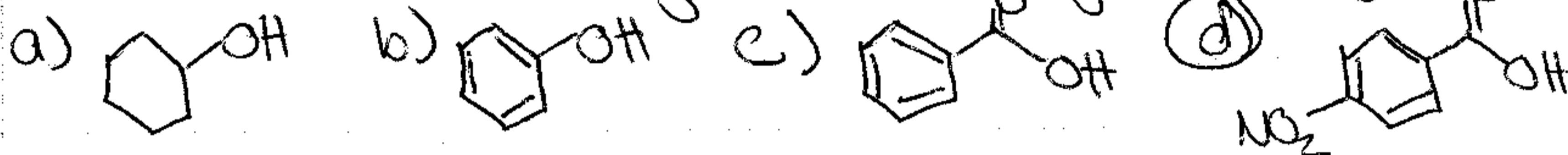
d) BDF

e) ADF

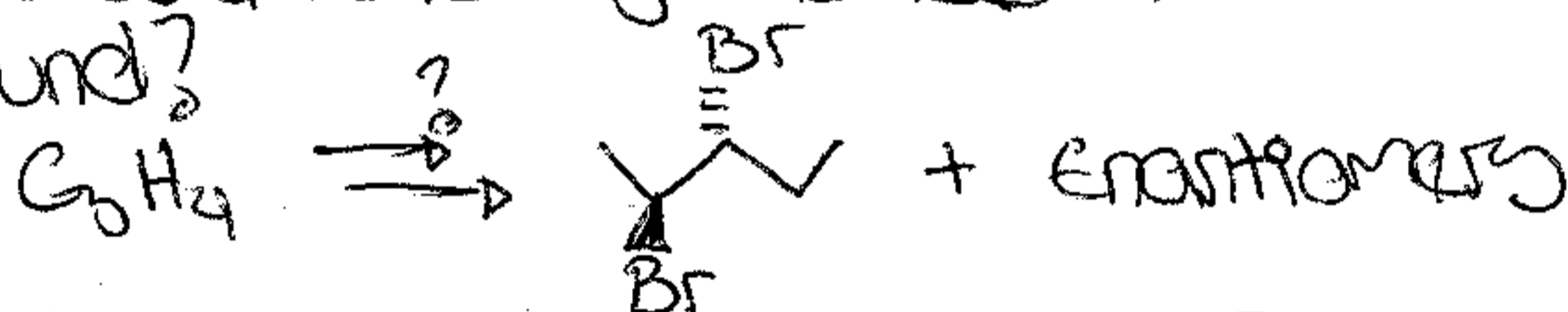
23) Which of the following is NOT a resonance contributor of compound A?



24) Which of the following is the strongest acid?



25) How would one synthesize the following compound?



- a) 1. $NaNH_2$, mineral oil, heat
 2. $EtCl$, DMF
 3. Br_2 , CCl_4

- b) 1. $NaNH_2$, mineral oil, heat
 2. $EtCl$, DMF
 3. HBr (excess), CCl_4

- c) 1. $NaNH_2$, mineral oil, heat
 2. $EtCl$, DMF
 3. H_2 Lindlar's catalyst
 4. Br_2 , CH_2Cl_2

- d) 1. $NaNH_2$, mineral oil, heat
 2. $EtCl$, DMF
 3. Na , $EtNH_2$
 4. NH_4Cl
 5. Br_2 , CCl_4