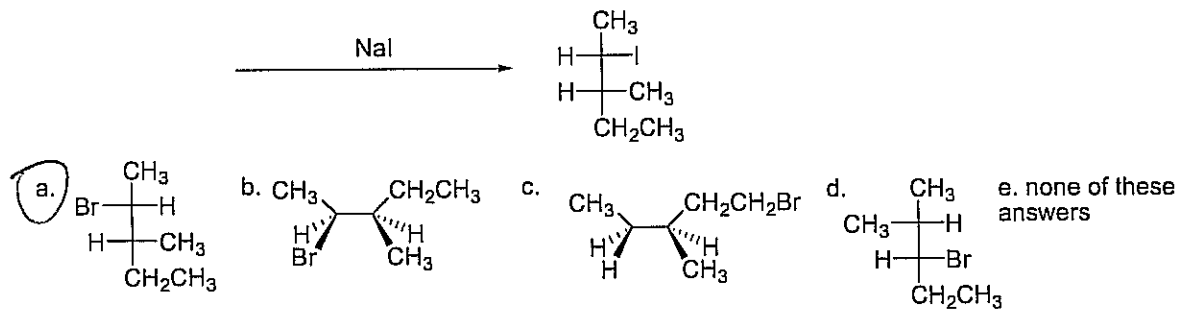


Sample Exam 3

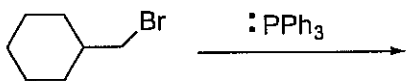
Instructor: ML Kwan

Part A. multiple choice (80 pts)

. What is the structure of the reactant that would yield the product shown?



What is the expected major pathway for the reaction shown?



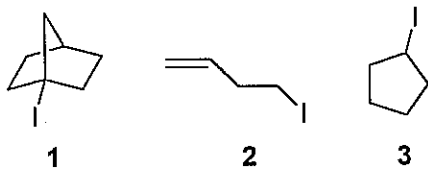
- (a) E2 (b) E1 (c) S_N2 (d) S_N1

What is the expected major pathway for the reaction shown?



- (a) E2 (b) E1 (c) S_N2 (d) S_N1 (e) radical substitution reaction

Which is the order from fastest to slowest for the S_N1 reactions of these alkyl iodides with CH₃CH₂OH?



(a) 1>2>3

(b) 2>3>1

(c) 3>1>2

(d) 1>3>2

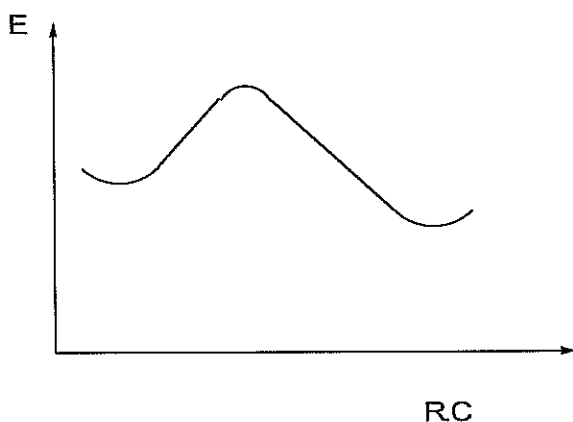
Predict the product of the reaction shown below.



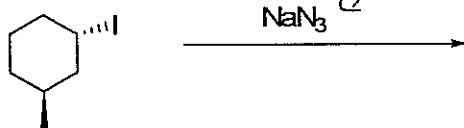
- a) product with R configuration b) product with S configuration c) racemic mixture d) none of these answers

The reaction coordination diagram shown below represents a _____ reaction.

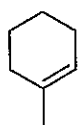
- a) $\text{S}_{\text{N}}2$ b) $\text{S}_{\text{N}}1$ c. none of these answers



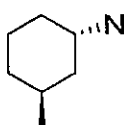
Predict the product of the reaction shown below.



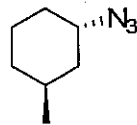
a.



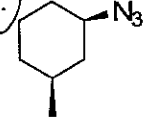
b.



c.

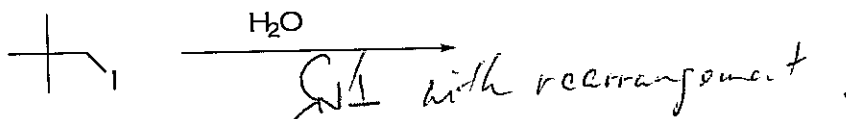


d.



e. none of these answers

Predict the product of the reaction shown below.

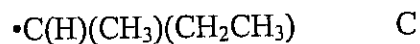


- a. CC(C)(C)COC b. CC(C)(C)C(O)C c. CC(C)(C)CO d. CC(C)=C e. None of these answers

S_N1 produces intermediate(s)

- (a) True (b) False

Rank the free radicals (A, B, C) show below in order of decreasing stability.



- a) $A > B > C$ b) $B > C > A$ c) $C > B > A$ d) $A > C > B$ e) $B > C > A$

Which of the following is a secondary alkyl halide?

- a) Methyl bromide b) 1-propyl fluoride c) t-butyl iodide d) isopropyl bromide e) isobutyl bromide

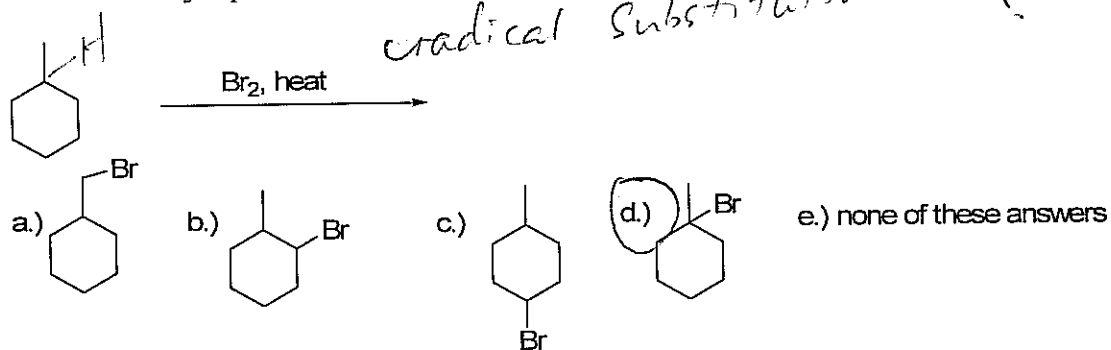
Which one of the following groups is not a strong nucleophile?

- a) CN^- b) H_2O c) OH^- d) I^- e) SH^-

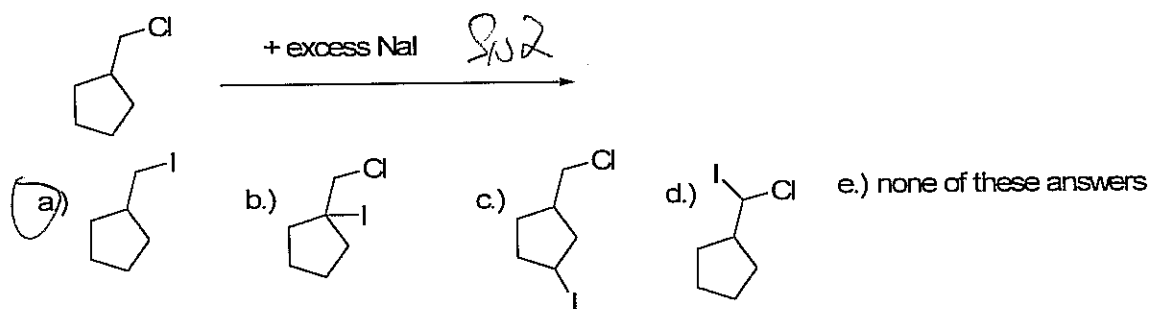
S_N2 reaction will not take place on _____

- a. 1° substrates b. Methyl substrates c. 2° substrates d. 3° substrates e. none of these answers

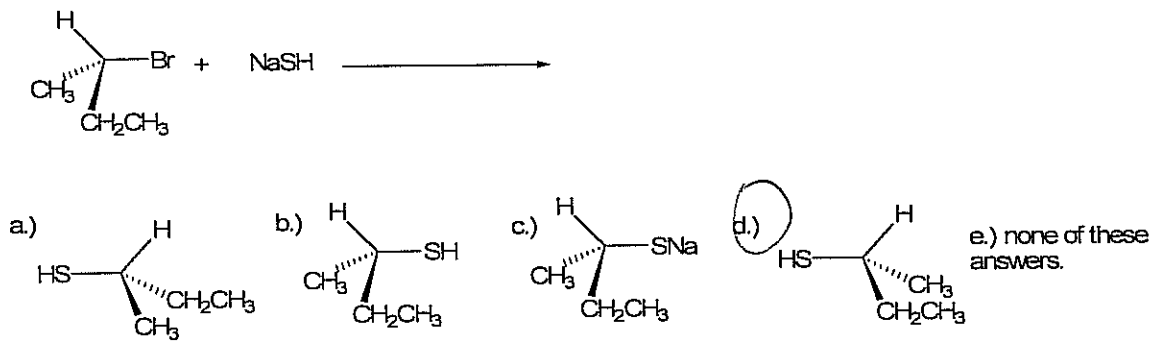
Predict the major product of the following reaction.



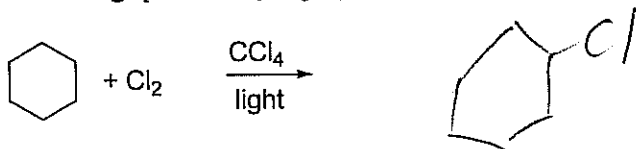
Predict the major product of the following reaction.

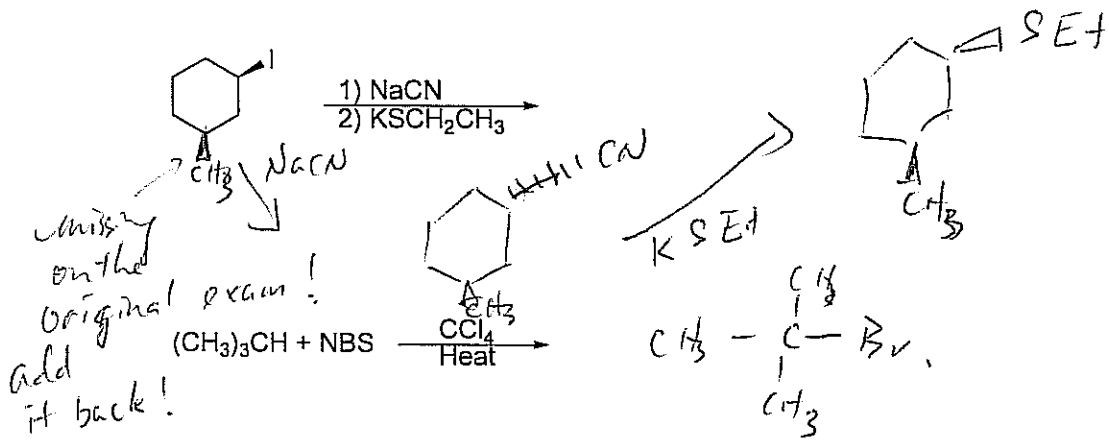
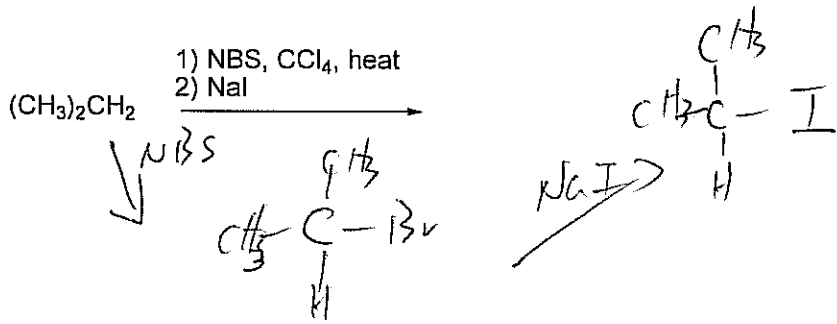


Predict the major product of the following reaction.



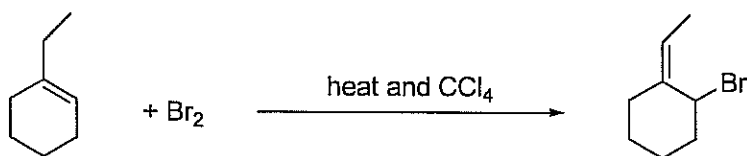
Predict the major products (with correct stereochemistry if applicable) for each of the following question (13 pts).



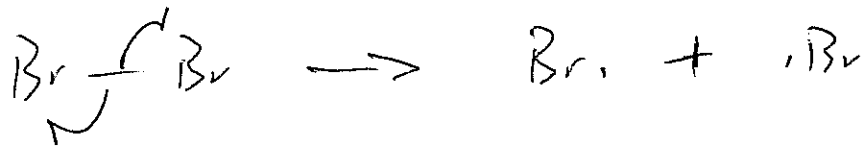


Mechanism:

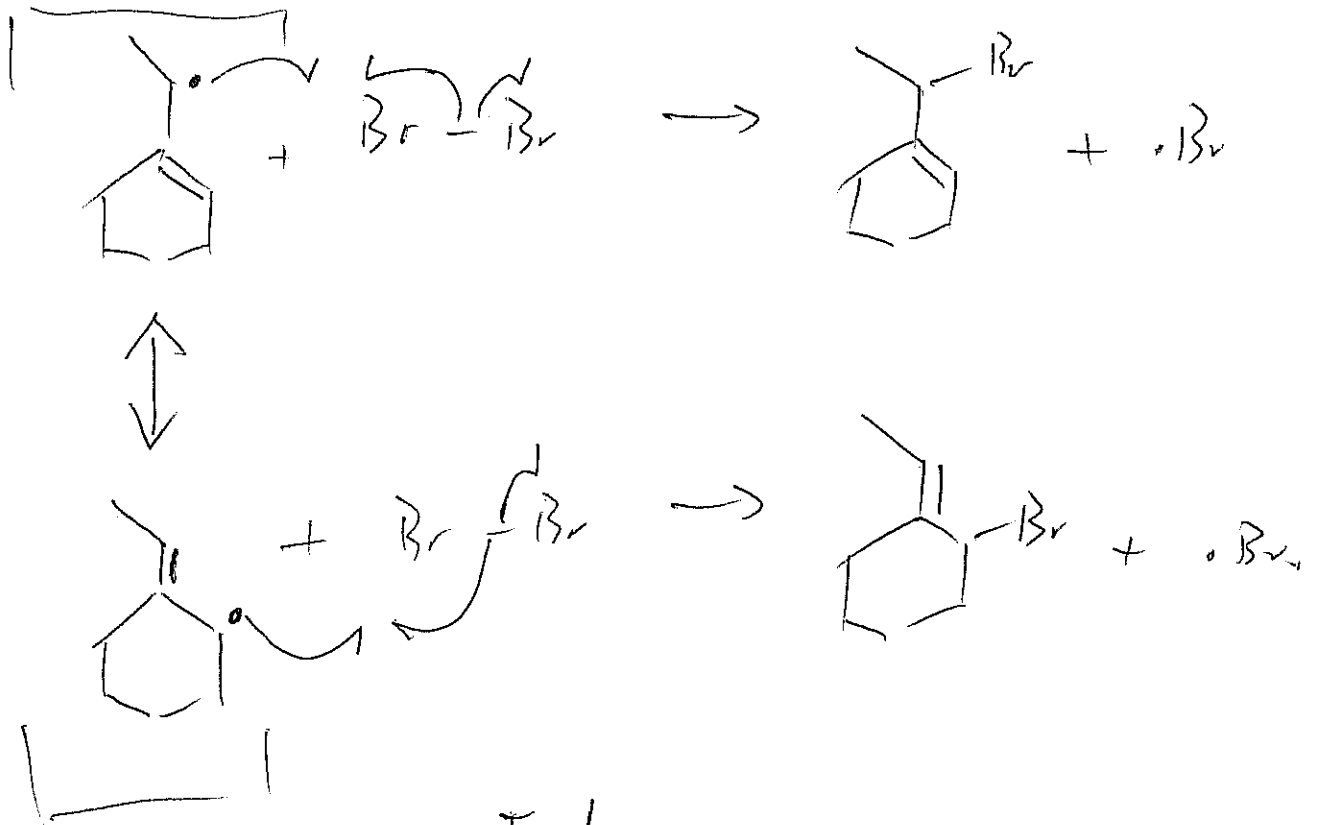
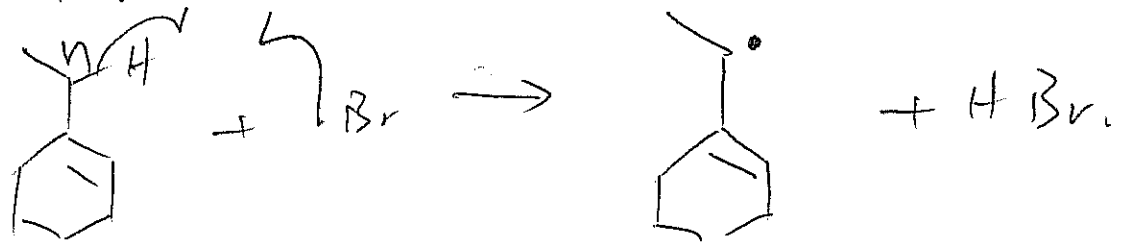
14. Draw a detailed mechanism for the reaction shown below (answer this question on the next page; 10 pts).



Initiation:

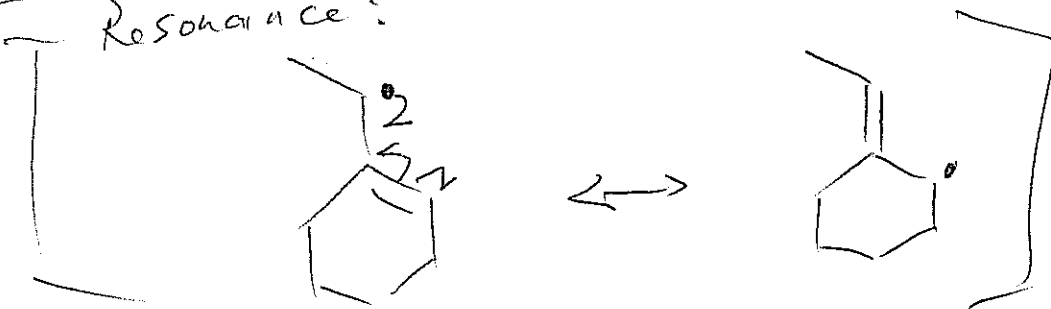


Propagation:



End.

Resonance:



Practice
Final Exam

Exam 1

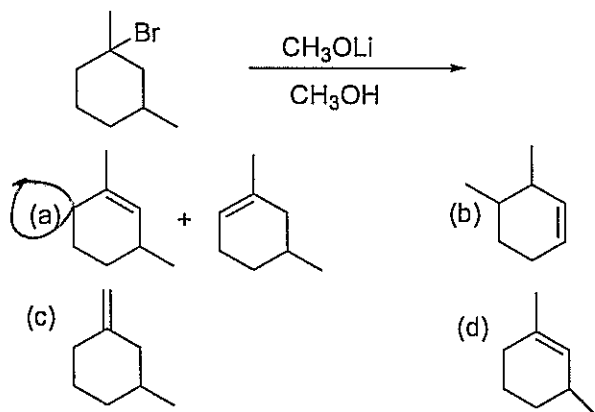
Instructor: ML Kwan

Print your name _____

Use a pencil to mark your answers on the scantron sheet.

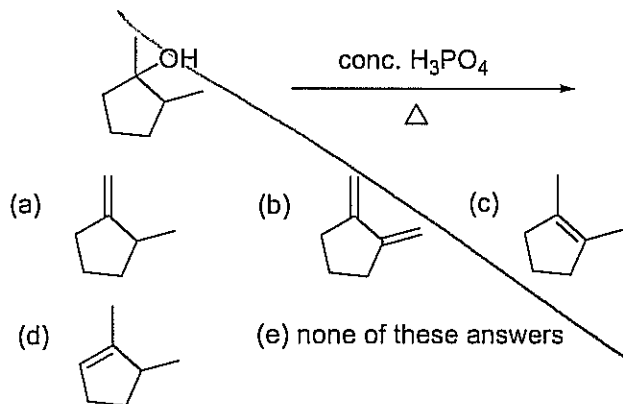
Part A. multiple choice (80 pts)

1. What is the principal (major) product(s) of the reaction shown?

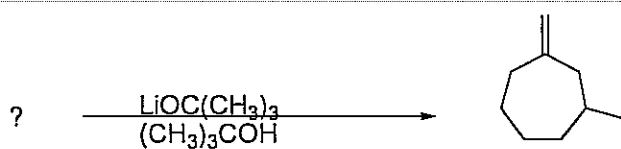


(e) none of these

2. What is the major product of the reaction shown?

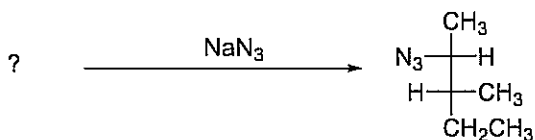


3. What is the structure of the reactant that would yield the product shown?



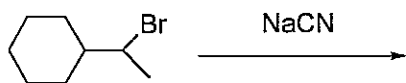
- a. b. c. d. e. none of the answers

4. What is the structure (Fischer projection) of the reactant that would yield the product shown?



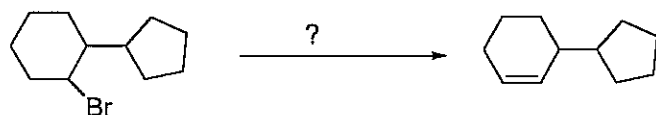
- a. b. c. d. e. none of these answers

5. What is the expected major pathway for the reaction shown?



- (a) E2 (b) E1 (c) SN2 (d) SN1 (e) none of these answers

6. Choose the most effective reagent for the synthesis shown below?



- (a) CH₃OH (b) NaOCH₃ (c) NaOH (d) LiOC(CH₃)₃ (e) none of these answers

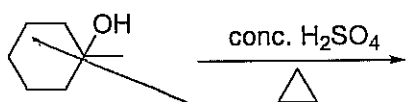
↑
bulky base favors Hoffmann product

7. What is the expected major product(s) for the reaction shown?



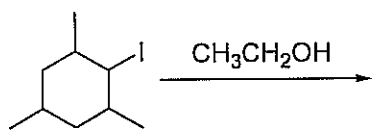
- (a) (b) (c) (d) (e) none of these answers

8. What is the expected major product(s) for the reaction shown?



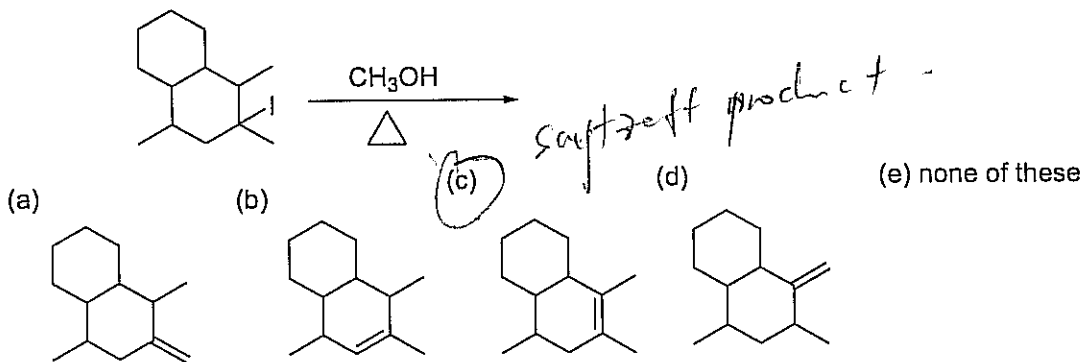
- (a) (b) (c) (d) (e) none of these answers

9. What is the reasonable product of the reaction shown?

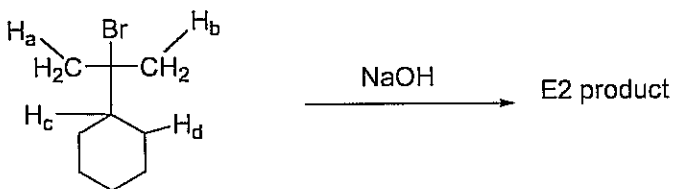


- (a) (b) (c) (d) (e) none of these
- after rearrangement*

10. What is the major product of the reaction shown?

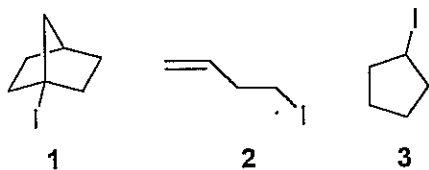


11. In the dehydrohalogenation shown below, which hydrogen atom (proton) is preferentially abstracted?



(a) H_a (b) H_b (c) H_c (d) H_d (e) none of these answers

12. Which is the order from fastest to slowest for the S_N2 reactions of these alkyl iodides with NaOH?



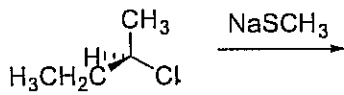
(a) 1>2>3

(b) 2>3>1

(c) 3>1>2

(d) 1>3>2

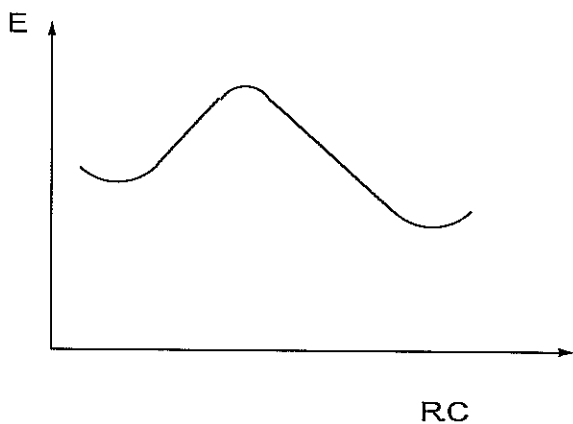
13. Predict the product of the reaction shown below.



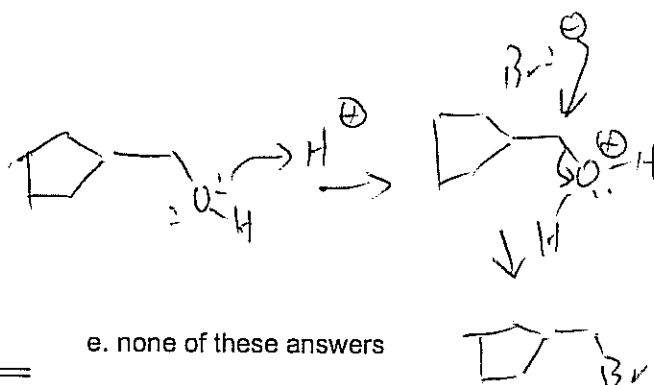
a) product with R configuration (b) product with S configuration c) racemic mixture d) none of these answers

14. The reaction coordination diagram shown below represents a _____ reaction.

(a). E2 (b). E1 (c). S_N1 (d). radical substitution reaction (e). none of these answers

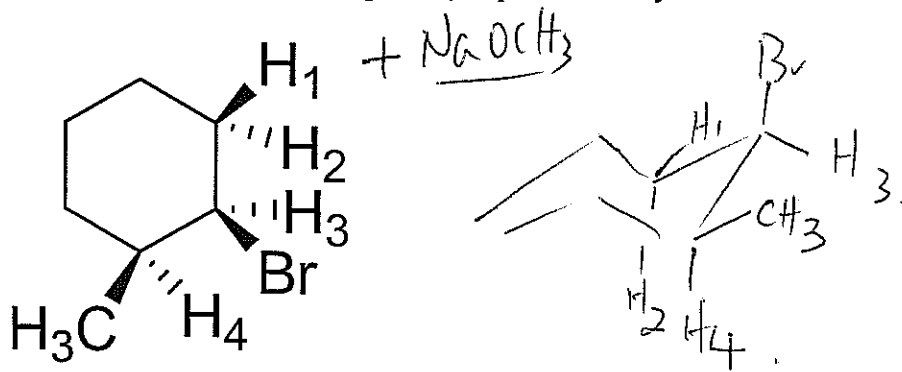


15. Predict the product of the reaction shown below.



- a.
 b.
 c.
 d.
 e. none of these answers

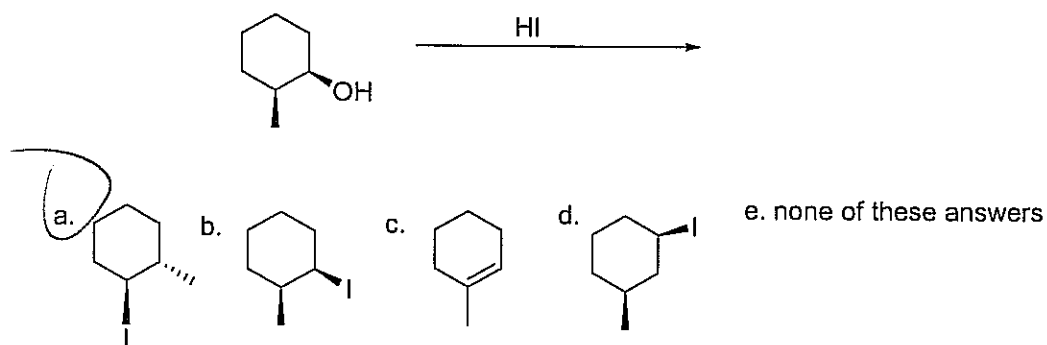
16. Which hydrogen atom (proton) is preferentially abstracted in the following reaction?



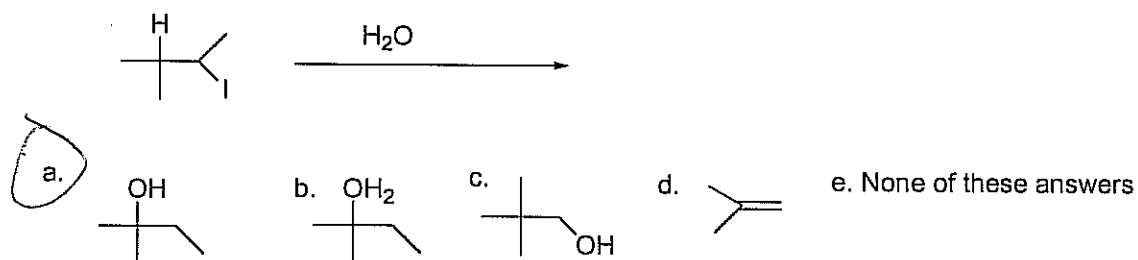
- a. H₁
 b. H₂
 c. H₃
 d. H₄
 e. none of these answers

← anti-coplanar. If a non-bulky base is used!!

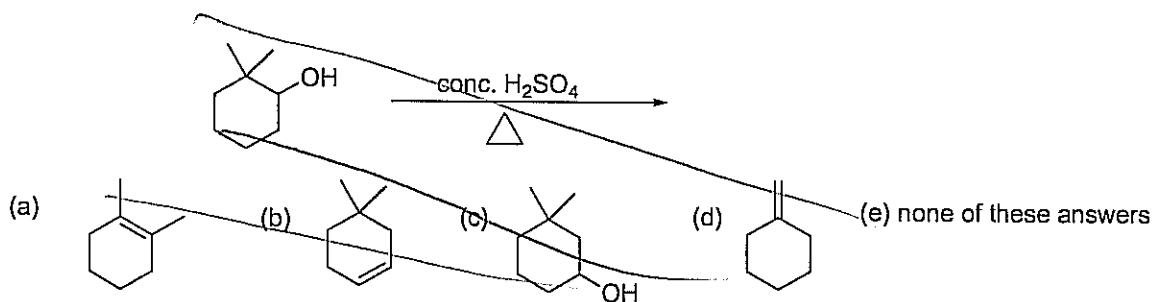
17. Predict the product of the reaction shown below.



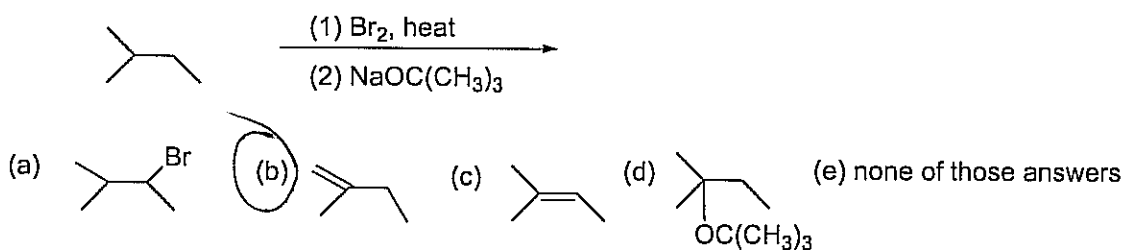
18. Predict the product of the reaction shown below.



19. Predict the product of the reaction shown below.



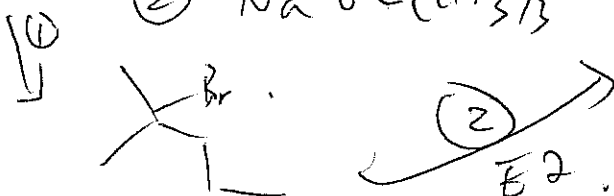
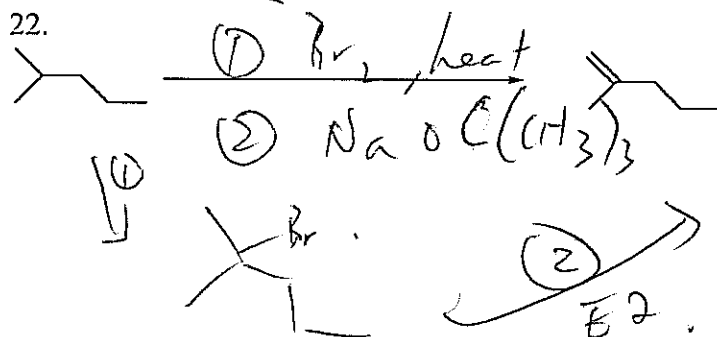
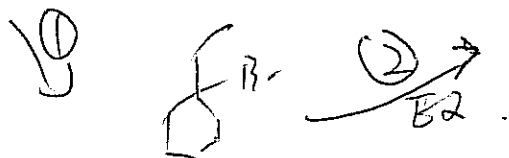
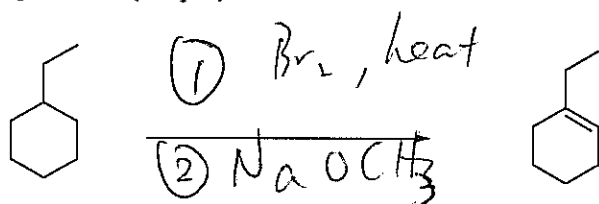
20. Predict the final product(s) of the synthesis shown below.



Part B.

Radical, nucleophilic substitution and elimination reactions.

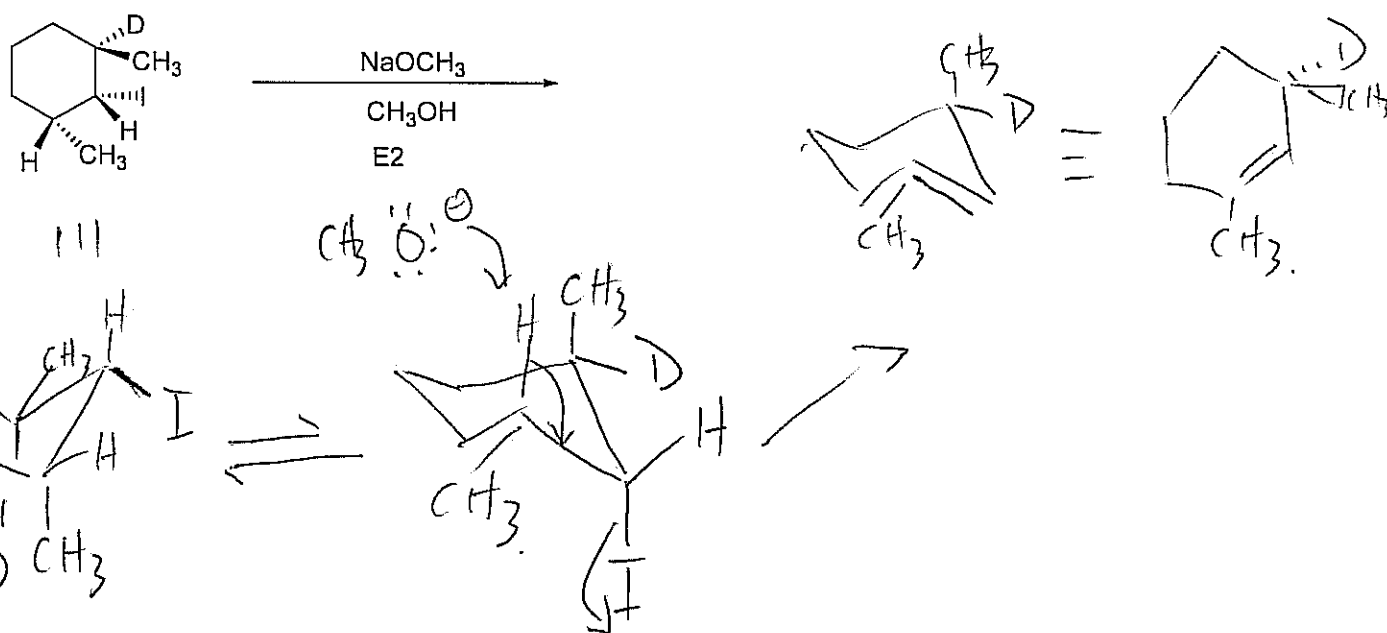
21. List all required reagents (in order; see question #20) to effect the following synthesis (10 pts)



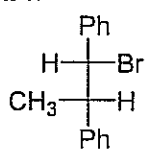
Mechanism (10 pts)

Propose reasonable mechanisms and predict the major product(s) for the following reactions.

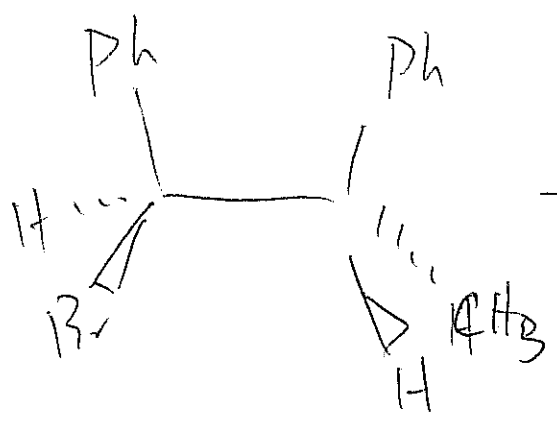
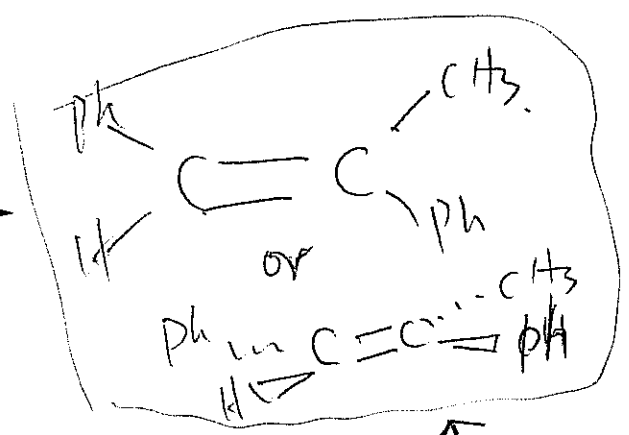
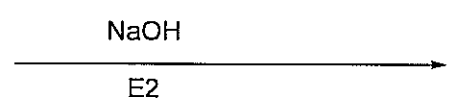
23.



24.



Fischer Projection



Rotate \rightarrow

