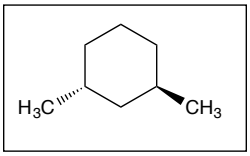
**Practice Exam 1 – This is a 60 minute exam**

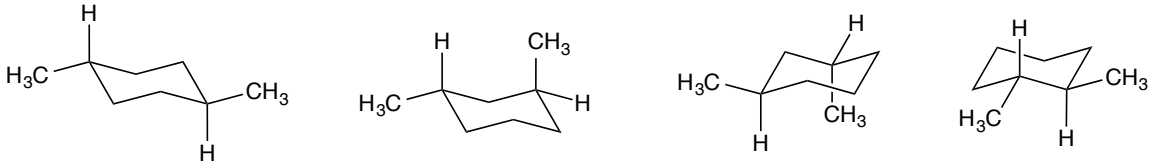
**Question 1.** Circle the <u>strongest base</u> from the list below


**Question 2.** Circle the compound with the <u>most angle strain</u> from the list below

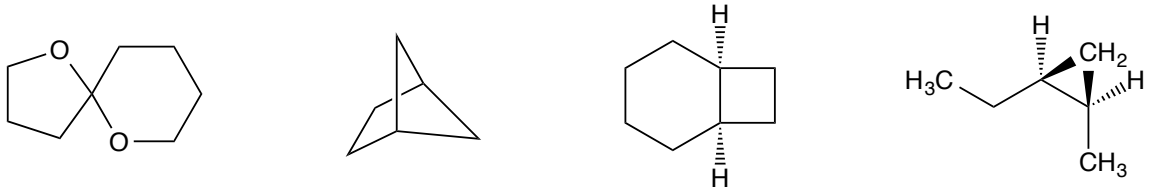
cyclobutane cyclopentane cyclohexane cycloheptane

**Question 3.** Which of the following chair drawings is an accurate depiction of the compound shown in the box (circle your answer)?




**Question 4.** Circle the <u>spiro bicyclic compound</u> shown below.



**Question 5.** Label each of the following pairs of molecules as **identical**, **structural isomers**, **conformational isomers, enantiomers** or **diastereomers** (***Note: if the 2 compounds can be interconverted via allowed bond rotation(s), then you should pick "conformational isomer"***).

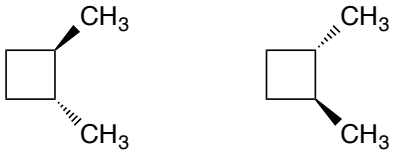
a) 2-chloropentane 3-chloropentane

Answer:

b)

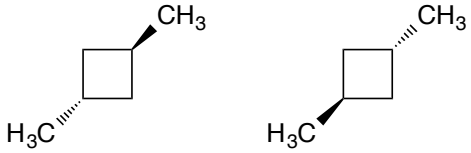

Answer:

c)



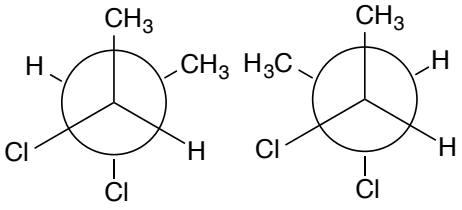

Answer:

d)



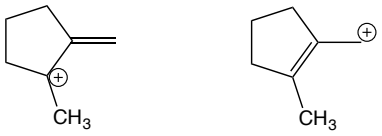

Answer:

e)




Answer:

**Question 6.** A student made the assertion that carbocation **A** (below) is more stable than carbocation **B**. Is this correct? Why or why not? *Make sure to be clear and complete in your explanation, and pictures can be helpful.*




**A** **B**

**Question 7.** Consider the two dichlorocyclohexanes below:


**A** **B**

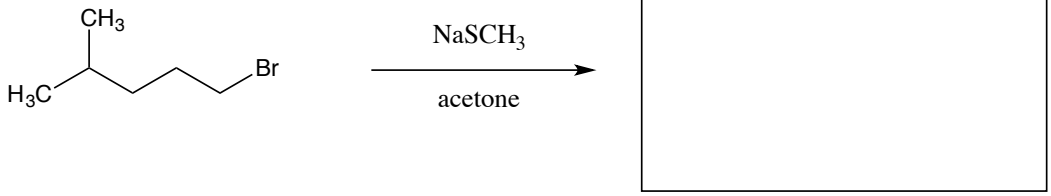
a) Draw compounds **A** and **B** in their most stable chair forms.

**A** **B**

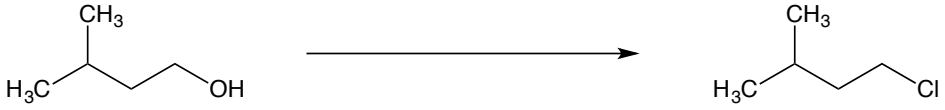
b) Which compound is more stable? Briefly explain your reasoning.

**Question 8.** Supply the missing reagents or products to most efficiently complete the following substitution reactions. Multiple reagents/steps may be needed.

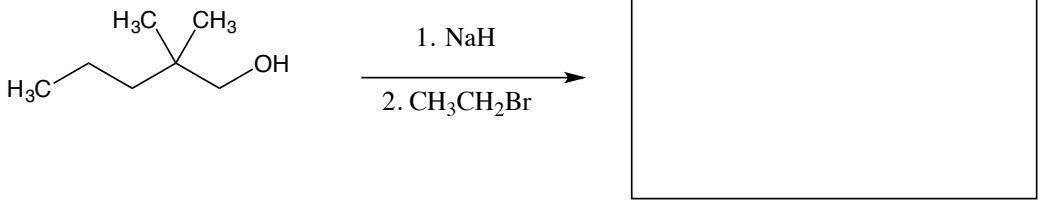
a)



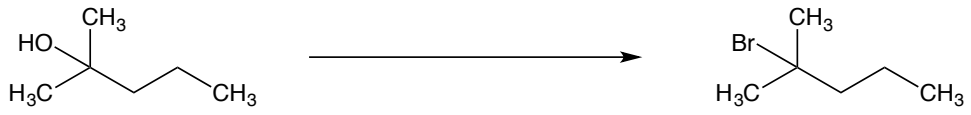

b)




c)




d)



**Question 9.** Provide a complete mechanism for the following transformation. *Don't skip any mechanistic steps, including $H^+$ transfers. Draw all intermediates and resonance structures.*