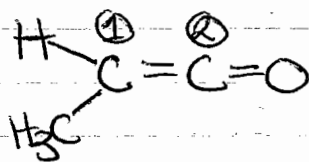


Colonna  
Organic Chem TEST #1 Fall 2009

1.) Identify the hybridization of the two indicated carbons.

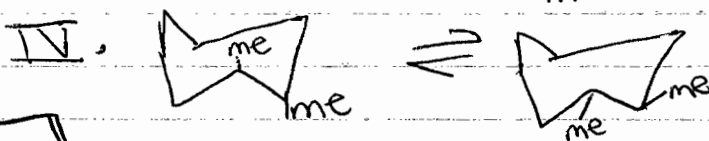
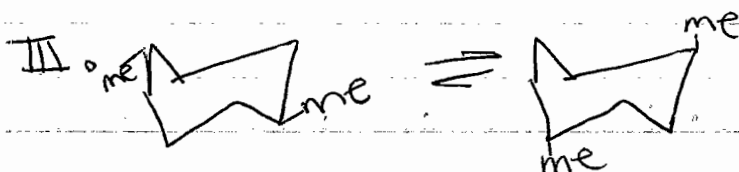
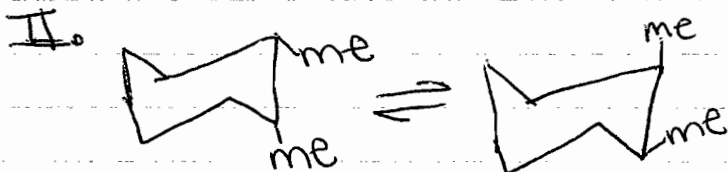
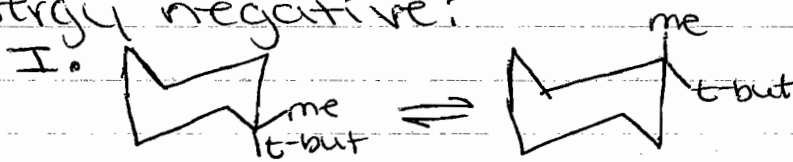


- a. C1  $sp^2$  C2  $sp$
- b. C1  $sp$  C2  $sp$
- c. C1  $sp^2$  C2  $sp^2$
- d. C1  $sp$  C2  $sp^2$

2.) What is hyperconjugation?

b. stabilizing interaction due to the overlap of a filled  $\sigma$  bonding molecular orbital and an empty  $\sigma^*$  antibonding molecular orbital.

3.) For which of the following is the energy negative?



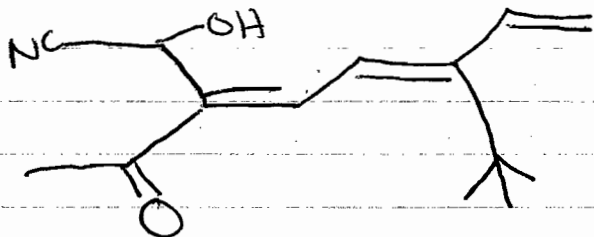
- a. I only
- b. II and III
- c. I and III
- d. III only

Need help? Visit [premedtutoring.com](http://premedtutoring.com) to see videos on how to solve all these test questions!

4.) what is the formal charge of Nitrogen in  $\text{HNO}_3$ ?

- a. 0   b. -1    c. +1   d. -2   e. +2

5.) Which is the correct configurational prefix for triene below? list from L to R



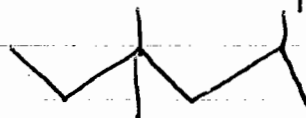
- A (E,E)  
B (Z,E)  
C (Z,Z)  
 D (E,Z)  
E (E,E,E)

6.) Which has the highest boiling point?

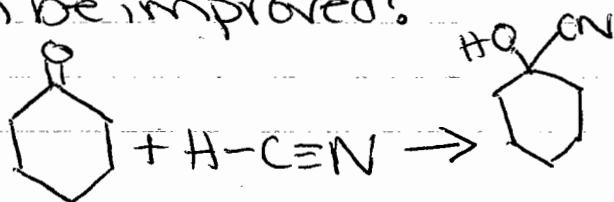
- A.  $\text{CH}_3\text{CH}=\text{O}$     B.  $\text{C}_2\text{H}_5\text{OH}$   
C.  $\text{CH}_3\text{OCH}_3$    D.  $\text{CH}_3\text{CH}_2\text{CH}_3$

7.) The alkane below has how many 1°, 2°, 3°, and 4° carbons?

	1°	2°	3°	4°
A	4	4	2	1
B	5	1	2	1
<input checked="" type="checkbox"/> C	5	2	1	1
D	6	1	1	1

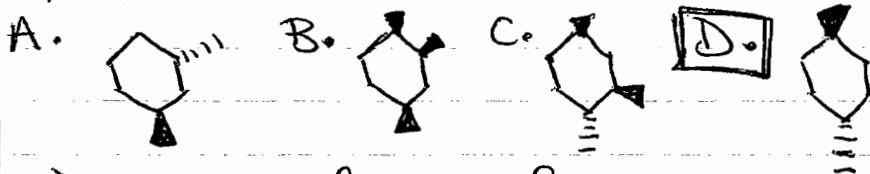


8.) Can the yield of the following rxn be improved?

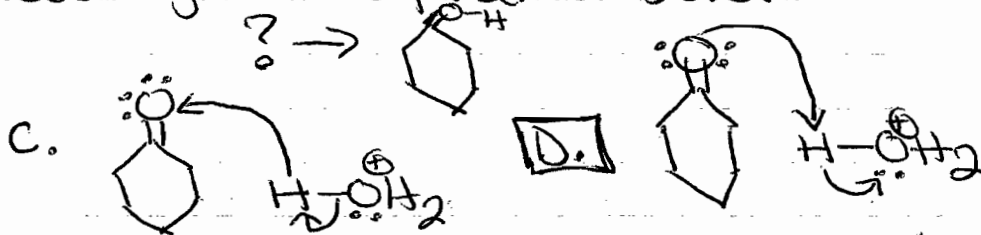


- A. Yes by higher Temp.  
 B. Yes by lowering Temp.  
C. Yes by high dilution  
D. No the yield can't be influenced.

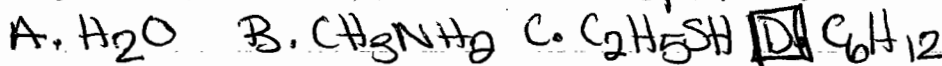
9.) Which structure has lowest energy?



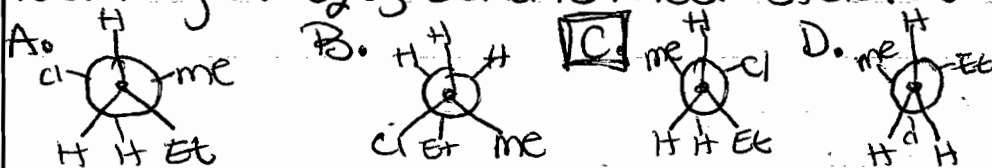
10.) Which of the following mechanisms would give the product below?



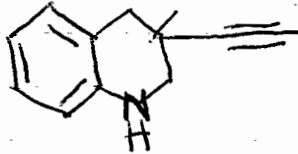
11.) Which is not a nucleophile?



12.) Which conformation of a 2-chloropentane looking at  $C_2C_3$  bond is most stable?

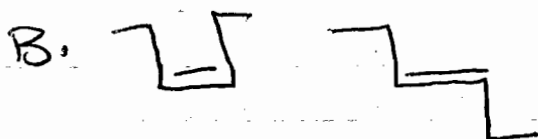
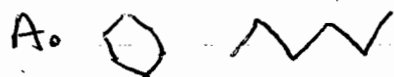


13.) How many degrees of unsaturation does this have?



**7**

14.) Which are constitutional isomers?



A. A only

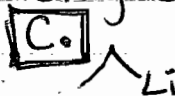
B. B only

C. C only

D. A+B

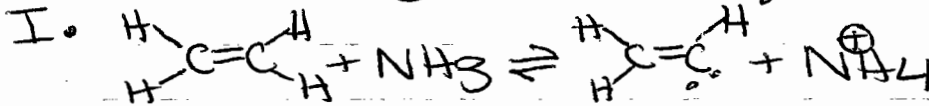
E. B+C

15.) Which is the strongest base?

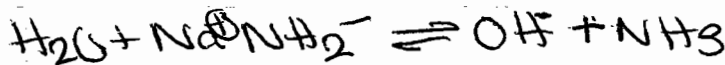


D. LiOH

16.) Predict the favorable direction of the 2 following acid-base equilibria



II.



A.  $\rightarrow \rightarrow$  B.  $\rightarrow \leftarrow$  C.  $\leftarrow \leftarrow$   D.  $\leftarrow \rightarrow$

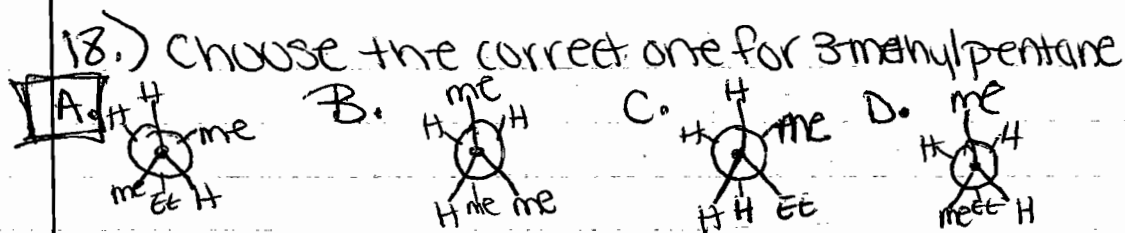
17.) Which conformation of 3,4-dibromobutane has the lowest dipole moment?

A. Br-Br anti

B. Br-Br gauche

C. Br-Br eclipsed

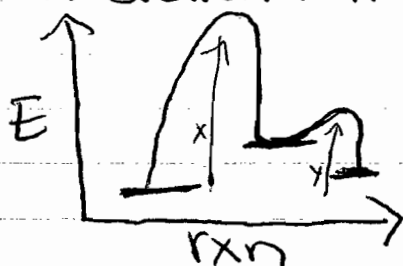
D. Br-H anti



19.) Calculate the energy of the most stable conformation of cis-1-Isopropyl-4-methylcyclohexane.

- A.  $3.6 \frac{\text{kJ}}{\text{mol}}$   B.  $7.2 \frac{\text{kJ}}{\text{mol}}$  C.  $11.8 \frac{\text{kJ}}{\text{mol}}$  D.  $4.6 \frac{\text{kJ}}{\text{mol}}$   
E.  $8.2 \frac{\text{kJ}}{\text{mol}}$

20.) Interpret graph and choose the correct statement



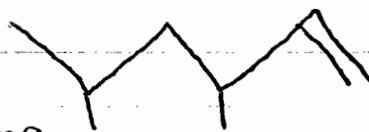
The second step of the rxn is fast and forms low yield.

21.) IUPAC name



- A. 4-sec-butyl-4,8-dimethyldecane  
 B. 3,4,8-trimethyl-4-propyldecane  
C. 3,7,8-trimethyl-7-propyldecane

22.) IUPAC name



- A. 2,4-dimethyl-5-hexane  
 C. 3,5-dimethyl-1-hexane

23.) Calculate the % of the following molecule found in its most stable chair conformation.



a. 95

b. 81

c. 72

d. 60

e. 55