Last Name	ANSWER	First Name	KEY	MI

Student ID Number:	Total Score
Circle the name of your TA: CARI HEATHER RYAN KAUSHIK	35 / 30
Discussion Section – Day: Time:	

Chem 30A Fall 2005

QUIZ #2A

(15 Min)

Weds Nov 9th

INTERPRETATION OF THE QUESTIONS IS PART OF THE EXAM – DO NOT ASK FOR THE QUESTIONS TO BE EXPLAINED TO YOU

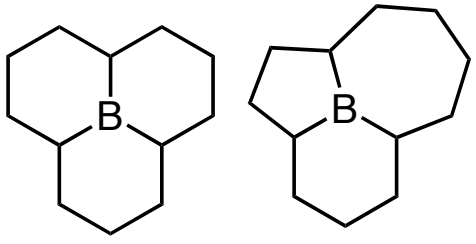
USE CAPITAL LETTERS WHEN FILLING IN THE BOXES AND BE CLEAR – IF WE CAN'T FIGURE OUT WHAT A LETTER IS, IT WILL AUTOMATICALLY BE GRADED AS INCORRECT

****DO NOT OPEN THIS EXAM UNTIL INSTRUCTED TO DO SO****

Q	1	2	3	4	5	6	7	8	9	10	Total
X	B	B	B	D	A	B	C	D	E	E	30

ANSWER TO BONUS QUESTION

Higher yield for the one with all 6-membered rings ⇨

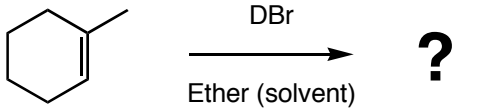


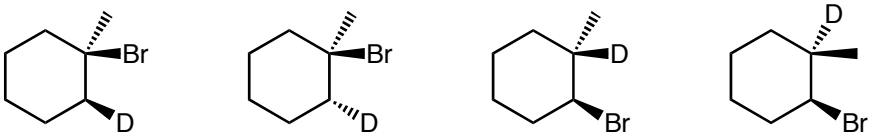
Here's a warm welcome to all the intelligent life forms out there. And to the rest of you... the trick is to bang the rocks together, guys.

– Douglas Adams

Questions 1–10 are worth **3** points each. The bonus is worth **5** points.

1. Assuming that the reaction of 1-methylcyclohexene with D–Br (the deuterium labelled version of H–Br) proceeds with absolute Markovnikov selectivity, what will the major product(s) of the reaction be?

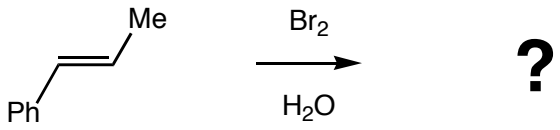


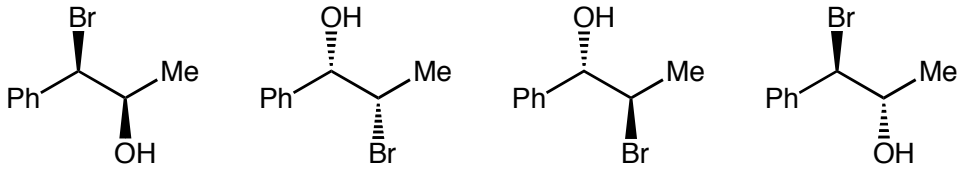


1 **2** **3** **4**

A Only 1 and 3
B Only 1 and 2
C Only 2 and 4
D All of them
E Only 3 and 4

2. The major product(s) of the reaction of the *trans*-alkene shown below with bromine in water are?

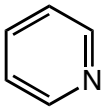




1 **2** **3** **4**

A Only 2
B Only 3
C Only 1 and 4
D Only 3 and 4
E Only 2 and 3

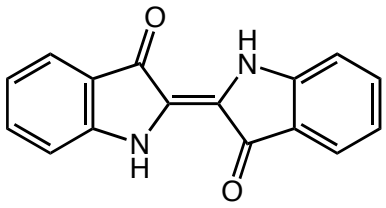
3. Pyridine, shown below, is most accurately described as:



Pyridine

A A Lewis acid and a Lewis base
B A Lewis base and a Bronsted base
C A Lewis acid and a Bronsted base
D A Bronsted base but NOT a Lewis base
E A Lewis base but NOT a Bronsted base

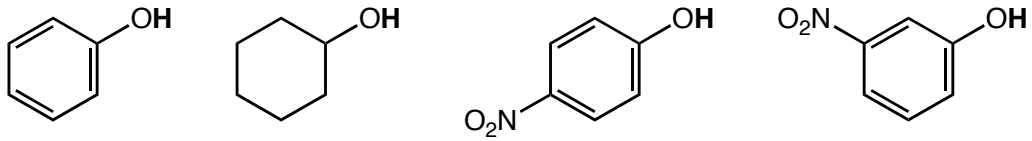
4. What is the Index of Hydrogen Deficiency (number of double bond equivalents) for the compound drawn below?



Indigo

A 7 **B** 9 **C** 11 **D** 13 **E** 15

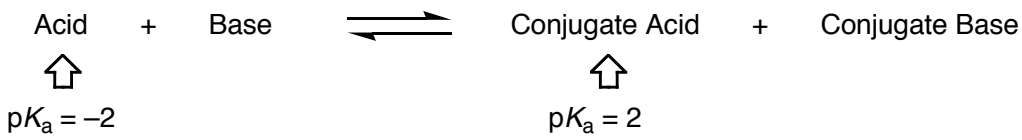
5. What is the order of acidity (from lowest pK_a value to highest pK_a value) of the bold hydrogen (**H**) atoms shown highlighted in the compounds drawn below?



1 **2** **3** **4**

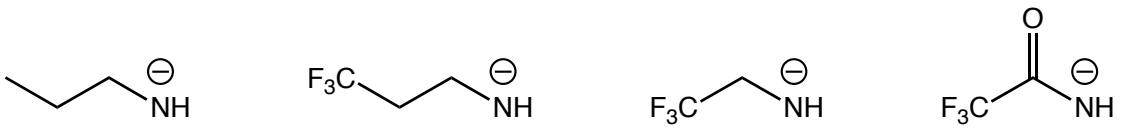
A 3, 4, 1, 2 **B** 2, 1, 4, 3 **C** 4, 3, 1, 2 **D** 1, 3, 4, 2 **E** 2, 1, 4, 3

6. The equilibrium constant (K_{eq}) for the reaction shown below is...?



A 0 **B** 10000 **C** 4 **D** –1 **E** 0.0001

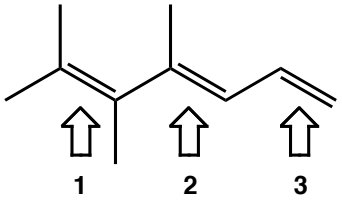
7. What is the order of basicity (from least basic to most basic) of the nitrogen-based anions drawn below?



1 **2** **3** **4**

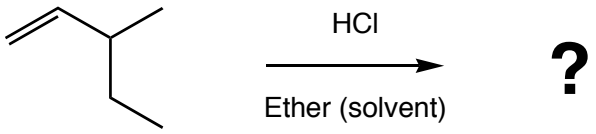
A 1, 2, 3, 4 **B** 3, 2, 1, 4 **C** 4, 3, 2, 1 **D** 4, 1, 2, 3 **E** 3, 4, 2, 1

8. For the triene shown below, for which double bond(s) is it possible to assign *E* or *Z* descriptors?



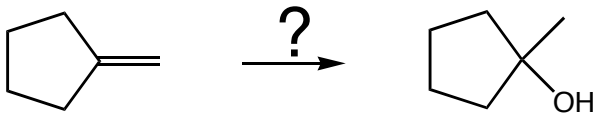
A **1**, **2**, and **3**
B Only **1** and **2**
C Only **2** and **3**
D Only **2**
E Only **1**

9. What is the major product of the reaction shown below?



A 1-chloro-3-methylpentane
B 2-chloro-3-ethylbutane
C 3-chloro-2-methylpentane
D 2-chloro-3-methylpentane
E 3-chloro-3-methylpentane

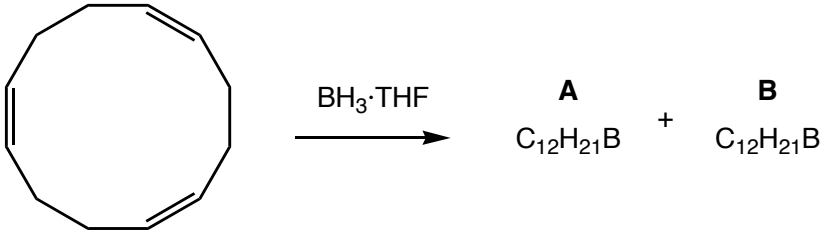
10. Which combination(s) of reagents would give rise to the reaction shown below?



#1 (i) BH_3·THF (ii) H_2O_2 / NaOH **#2** (i) $Hg(OAc)_2/H_2O$ (ii) $NaBH_4$ **#3** H_2O/H_2SO_4(cat.)

A #1, #2, and #3 **B** Only #1 **C** Only #2 **D** Only #3 **E** Only #2 and #3

BONUS: 1,5,9-Cyclododecatriene reacts with borane·THF to form two different compounds (**A** and **B**) with the formula $C_{12}H_{21}B$. Neither **A** nor **B** contains any B–H bonds. On the FRONT PAGE of this quiz, fill in the structures of **A** and **B**, and indicate which one is likely to be formed in higher yield.



***** *End of Quiz* *****

Last Name	ANSWER	First Name	KEY	MI

Student ID Number:	Total Score
Circle the name of your TA: CARI HEATHER RYAN KAUSHIK	35 / 30
Discussion Section – Day: Time:	

Chem 30A Fall 2005

QUIZ #2B

(15 Min)

Weds Nov 9th

INTERPRETATION OF THE QUESTIONS IS PART OF THE EXAM – DO NOT ASK FOR THE QUESTIONS TO BE EXPLAINED TO YOU

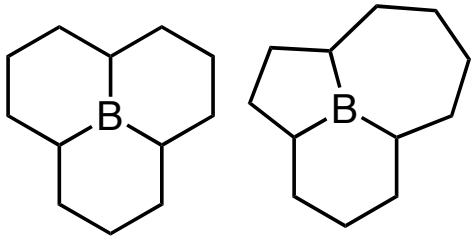
USE CAPITAL LETTERS WHEN FILLING IN THE BOXES AND BE CLEAR – IF WE CAN'T FIGURE OUT WHAT A LETTER IS, IT WILL AUTOMATICALLY BE GRADED AS INCORRECT

****DO NOT OPEN THIS EXAM UNTIL INSTRUCTED TO DO SO****

Q	1	2	3	4	5	6	7	8	9	10	Total
X	C	C	A	B	E	A	A	E	C	C	30

ANSWER TO BONUS QUESTION

Higher yield for the one with all 6-membered rings ⇨

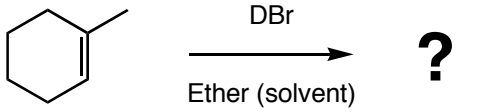


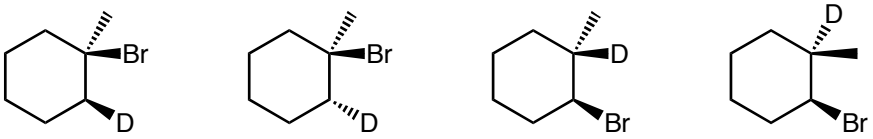
Here's a warm welcome to all the intelligent life forms out there. And to the rest of you... the trick is to bang the rocks together, guys.

– Douglas Adams

Questions 1–10 are worth **3** points each. The bonus is worth **5** points.

1. Assuming that the reaction of 1-methylcyclohexene with D–Br (the deuterium labelled version of H–Br) proceeds with absolute Markovnikov selectivity, what will the major product(s) of the reaction be?

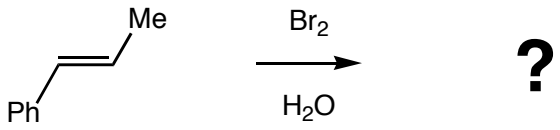


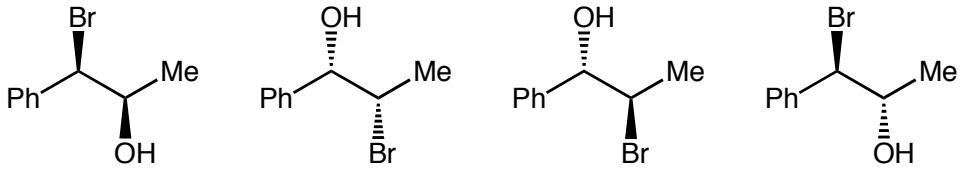


1 **2** **3** **4**

A Only 3 and 4
B Only 2 and 4
C Only 1 and 2
D All of them
E Only 1 and 3

2. The major product(s) of the reaction of the *trans*-alkene shown below with bromine in water are?

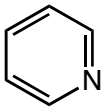




1 **2** **3** **4**

A Only 2 and 3
B Only 2
C Only 3
D Only 1 and 4
E Only 3 and 4

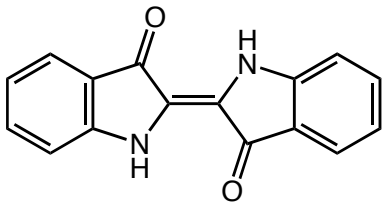
3. Pyridine, shown below, is most accurately described as:



Pyridine

A A Lewis base and a Bronsted base
B A Lewis acid and a Bronsted base
C A Bronsted base but NOT a Lewis base
D A Lewis base but NOT a Bronsted base
E A Lewis acid and a Lewis base

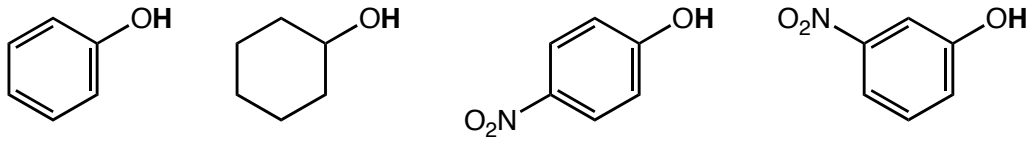
4. What is the Index of Hydrogen Deficiency (number of double bond equivalents) for the compound drawn below?



Indigo

A 15 **B** 13 **C** 11 **D** 9 **E** 7

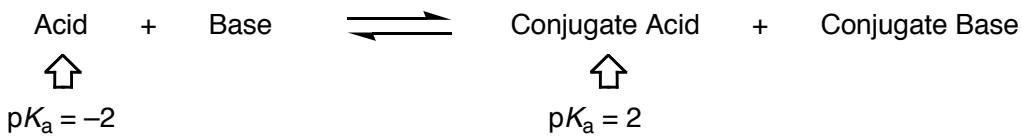
5. What is the order of acidity (from lowest pK_a value to highest pK_a value) of the bold hydrogen (**H**) atoms shown highlighted in the compounds drawn below?



1 **2** **3** **4**

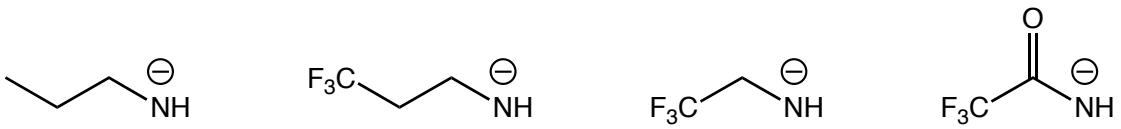
A 2, 1, 4, 3 **B** 1, 3, 4, 2 **C** 4, 3, 1, 2 **D** 2, 1, 4, 3 **E** 3, 4, 1, 2

6. The equilibrium constant (K_{eq}) for the reaction shown below is...?



A 10000 **B** 0 **C** –1 **D** 4 **E** 0.0001

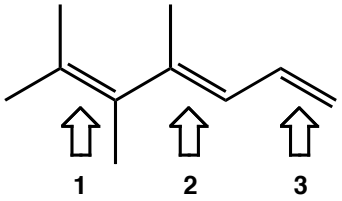
7. What is the order of basicity (from least basic to most basic) of the nitrogen-based anions drawn below?



1 **2** **3** **4**

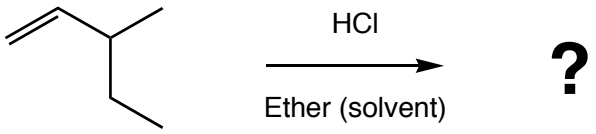
A 4, 3, 2, 1 **B** 3, 2, 1, 4 **C** 1, 2, 3, 4 **D** 4, 1, 2, 3 **E** 3, 4, 2, 1

8. For the triene shown below, for which double bond(s) is it possible to assign *E* or *Z* descriptors?



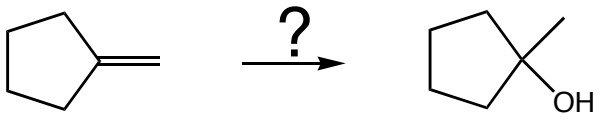
A **1**, **2**, and **3**
B Only **2** and **3**
C Only **1** and **2**
D Only **1**
E Only **2**

9. What is the major product of the reaction shown below?



A 1-chloro-3-methylpentane
B 2-chloro-3-ethylbutane
C 3-chloro-3-methylpentane
D 3-chloro-2-methylpentane
E 2-chloro-3-methylpentane

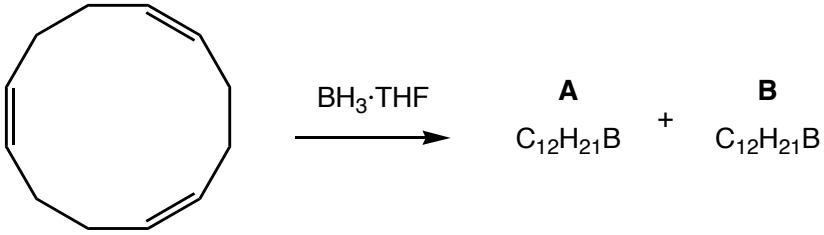
10. Which combination(s) of reagents would give rise to the reaction shown below?



#1 (i) BH_3·THF (ii) H_2O_2 / NaOH **#2** (i) $Hg(OAc)_2/H_2O$ (ii) $NaBH_4$ **#3** H_2O/H_2SO_4(cat.)

A #1, #2, and #3 **B** Only #3 **C** Only #2 and #3 **D** Only #1 **E** Only #2

BONUS: 1,5,9-Cyclododecatriene reacts with borane·THF to form two different compounds (**A** and **B**) with the formula $C_{12}H_{21}B$. Neither **A** nor **B** contains any B–H bonds. On the FRONT PAGE of this quiz, fill in the structures of **A** and **B**, and indicate which one is likely to be formed in higher yield.



***** *End of Quiz* *****

Last Name	ANSWER	First Name	KEY	MI

Student ID Number:	Total Score
Circle the name of your TA: CARI HEATHER RYAN KAUSHIK	35 / 30
Discussion Section – Day: Time:	

Chem 30A Fall 2005

QUIZ #2C

(15 Min)

Weds Nov 9th

INTERPRETATION OF THE QUESTIONS IS PART OF THE EXAM – DO NOT ASK FOR THE QUESTIONS TO BE EXPLAINED TO YOU

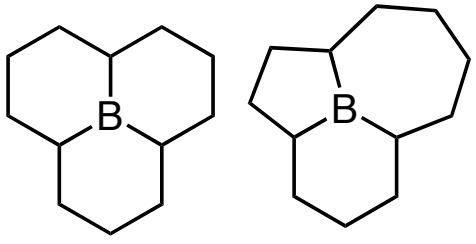
USE CAPITAL LETTERS WHEN FILLING IN THE BOXES AND BE CLEAR – IF WE CAN'T FIGURE OUT WHAT A LETTER IS, IT WILL AUTOMATICALLY BE GRADED AS INCORRECT

****DO NOT OPEN THIS EXAM UNTIL INSTRUCTED TO DO SO****

Q	1	2	3	4	5	6	7	8	9	10	Total
X	D	E	E	A	C	E	B	B	A	B	30

ANSWER TO BONUS QUESTION

Higher yield for the one with all 6-membered rings ⇨

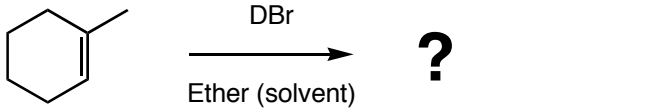


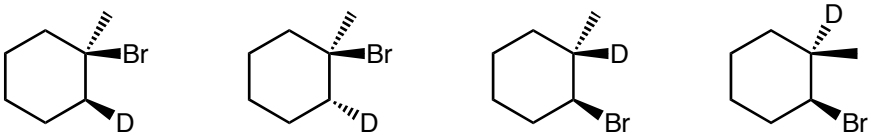
Here's a warm welcome to all the intelligent life forms out there. And to the rest of you... the trick is to bang the rocks together, guys.

– Douglas Adams

Questions 1–10 are worth **3** points each. The bonus is worth **5** points.

1. Assuming that the reaction of 1-methylcyclohexene with D–Br (the deuterium labelled version of H–Br) proceeds with absolute Markovnikov selectivity, what will the major product(s) of the reaction be?

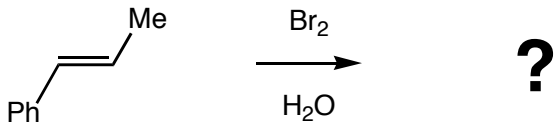


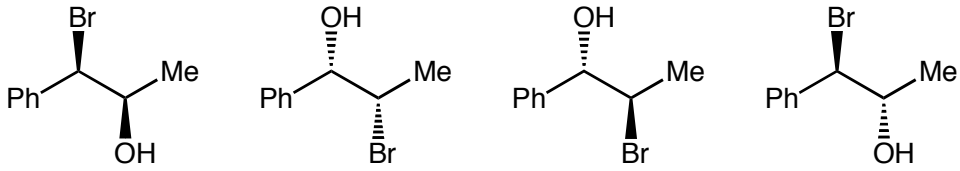


1 **2** **3** **4**

A Only 1 and 3
B Only 2 and 4
C Only 3 and 4
D Only 1 and 2
E All of them

2. The major product(s) of the reaction of the *trans*-alkene shown below with bromine in water are?

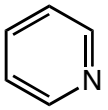




1 **2** **3** **4**

A Only 2 and 3
B Only 2
C Only 3 and 4
D Only 1 and 4
E Only 3

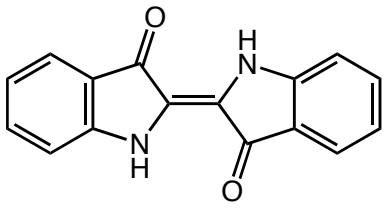
3. Pyridine, shown below, is most accurately described as:



Pyridine

A A Lewis acid and a Lewis base
B A Lewis acid and a Bronsted base
C A Bronsted base but NOT a Lewis base
D A Lewis base but NOT a Bronsted base
E A Lewis base and a Bronsted base

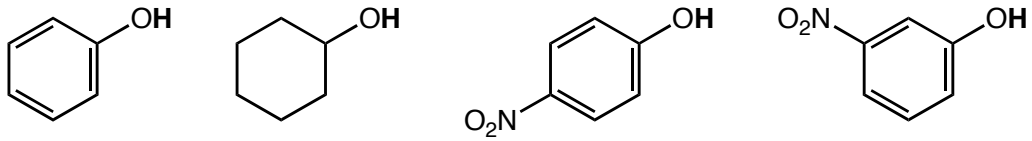
4. What is the Index of Hydrogen Deficiency (number of double bond equivalents) for the compound drawn below?



Indigo

A 13 **B** 15 **C** 9 **D** 11 **E** 7

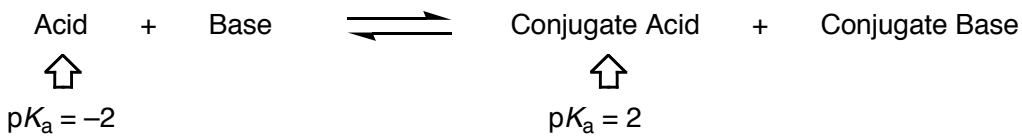
5. What is the order of acidity (from lowest pK_a value to highest pK_a value) of the bold hydrogen (**H**) atoms shown highlighted in the compounds drawn below?



1 **2** **3** **4**

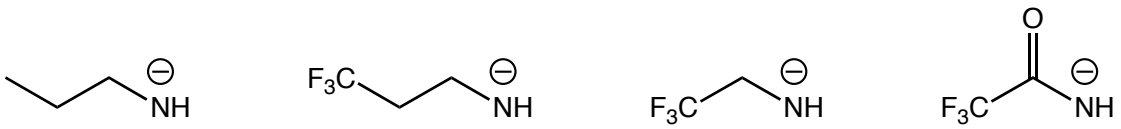
A 2, 1, 4, 3 **B** 1, 3, 4, 2 **C** 3, 4, 1, 2 **D** 2, 1, 4, 3 **E** 4, 3, 1, 2

6. The equilibrium constant (K_{eq}) for the reaction shown below is...?



A 0.0001 **B** 0 **C** –1 **D** 4 **E** 10000

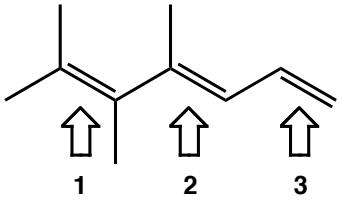
7. What is the order of basicity (from least basic to most basic) of the nitrogen-based anions drawn below?



1 **2** **3** **4**

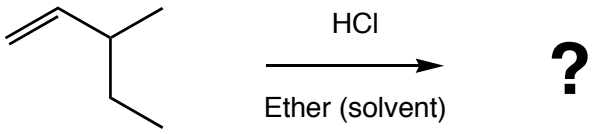
A 3, 2, 1, 4 **B** 4, 3, 2, 1 **C** 1, 2, 3, 4 **D** 4, 1, 2, 3 **E** 3, 4, 2, 1

8. For the triene shown below, for which double bond(s) is it possible to assign *E* or *Z* descriptors?



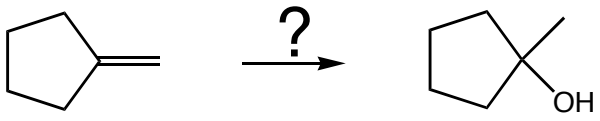
A **1**, **2**, and **3**
B Only **2**
C Only **1** and **2**
D Only **1**
E Only **2** and **3**

9. What is the major product of the reaction shown below?



A 3-chloro-3-methylpentane
B 2-chloro-3-ethylbutane
C 1-chloro-3-methylpentane
D 3-chloro-2-methylpentane
E 2-chloro-3-methylpentane

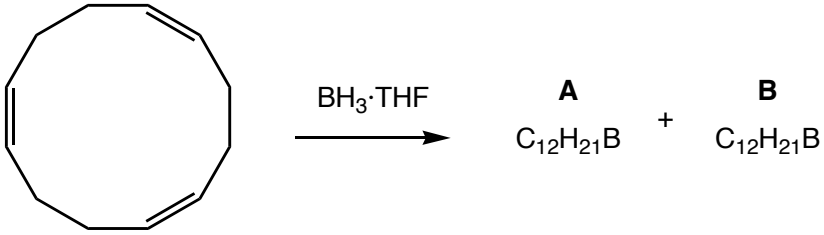
10. Which combination(s) of reagents would give rise to the reaction shown below?



#1 (i) BH_3·THF (ii) H_2O_2 / NaOH **#2** (i) $Hg(OAc)_2/H_2O$ (ii) $NaBH_4$ **#3** H_2O/H_2SO_4(cat.)

A #1, #2, and #3 **B** Only #2 and #3 **C** Only #3 **D** Only #1 **E** Only #2

BONUS: 1,5,9-Cyclododecatriene reacts with borane·THF to form two different compounds (**A** and **B**) with the formula $C_{12}H_{21}B$. Neither **A** nor **B** contains any B–H bonds. On the FRONT PAGE of this quiz, fill in the structures of **A** and **B**, and indicate which one is likely to be formed in higher yield.



***** *End of Quiz* *****