



THE UNIVERSITY OF
TOLEDO
1872

CHEM 2410 – Organic Chemistry I

CHEM 2410 Fall 2016 – Mid-Term Exam 2 10-26-16

Time: 5:45pm – 6:45pm

Student Name: _____

Student Number: _____

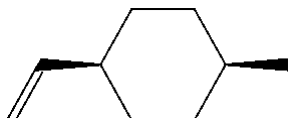
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|------------------------------------|
| Instructor: Prof. Andreeana |
| Room #: RH 1520 |

Exam #2 Chem 2410

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. What is the name of the following compound?

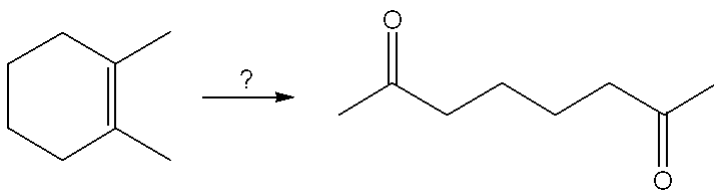


- a. *cis*-4-methyl-1-allylcyclohexane
- b. *cis*-4-allyl-1-methylcyclohexane
- c. *trans*-4-allyl-1-methylcyclohexane
- d. *cis*-4-methyl-1-vinylcyclohexane

2. Which of the following reactions is a net *syn* stereospecificity?

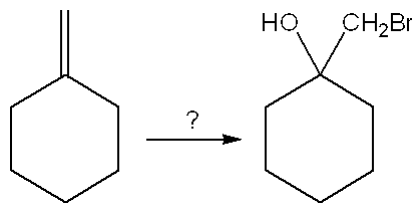
- a. addition of bromine (treatment with Br₂)
- b. hydrogenation (treatment with H₂/Pt)
- c. addition of HBr (treatment with HBr)
- d. acid-catalyzed hydration (treatment with aqueous H₂SO₄)

3. What is the best choice of reagent(s) to perform the following transformation?



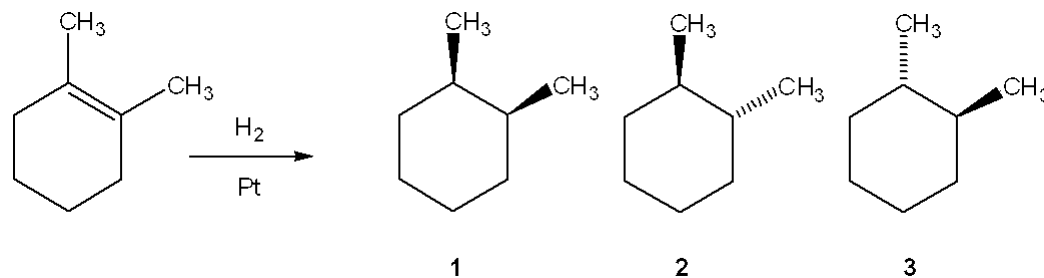
- a. O₃; followed by (CH₃)₂S
- b. H₂,
- c. BH₃; followed by H₂O₂, NaOH
- d. OsO₄; followed by NaHSO₃

4. What is the best choice of reagent to perform the following transformation?



- a. Br_2
- b. HBr
- c. $\text{Br}_2, \text{H}_2\text{O}$
- d. *N*-bromosuccinimide

5. What is (are) the major organic product(s) obtained from the following reaction?



- a. only **1**
- b. only **2**
- c. only **3**
- d. only **2** and **3**

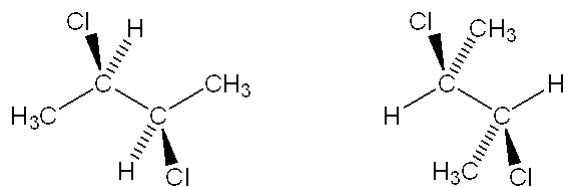
6. What is (are) the major organic product(s) obtained from the following reaction?



- 1. (2*R*,3*R*)-dibromobutane
- 2. (2*S*,3*S*)-dibromobutane
- 3. *meso*-2,3-dibromobutane

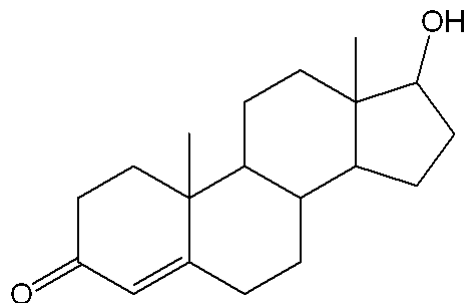
- a. only **1**
- b. only **2**
- c. only **3**
- d. only **1** and **2**

7. What is the relationship between the following pair of structures?



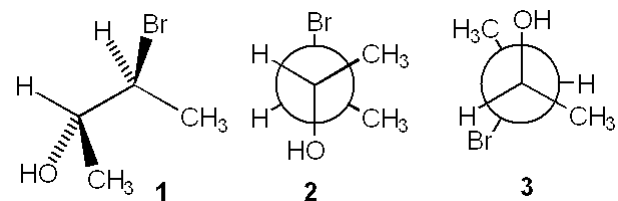
- They are enantiomers
- They are diastereomers
- They are constitutional isomers
- They are identical

8. How many stereogenic centers are there in the following molecule (the naturally occurring stereoisomer is the male hormone testosterone)?



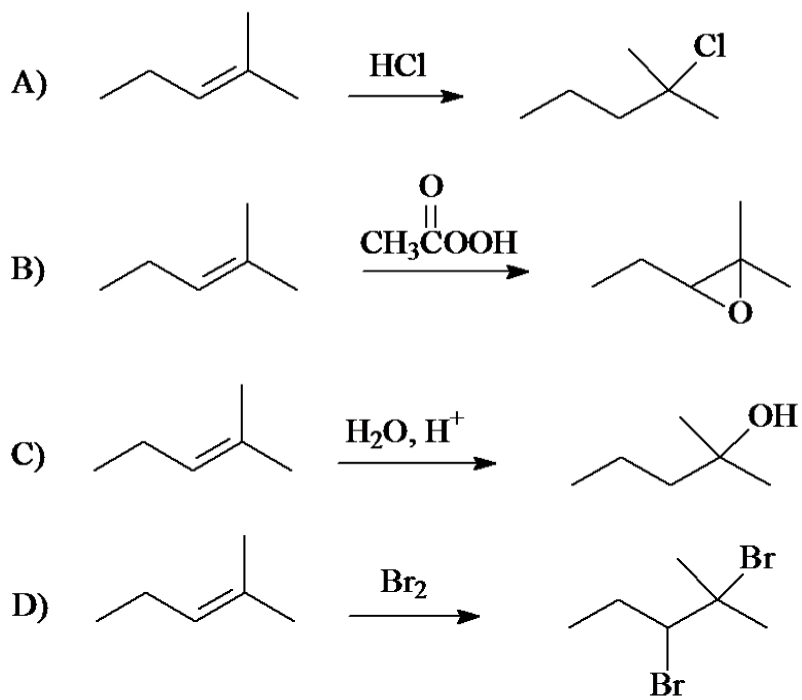
- Three
- Four
- Six
- Seven

9. Which of the following structures represent the same stereoisomer?



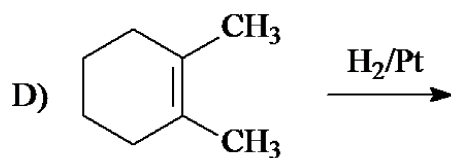
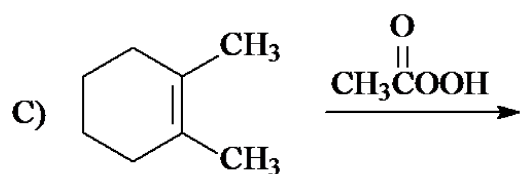
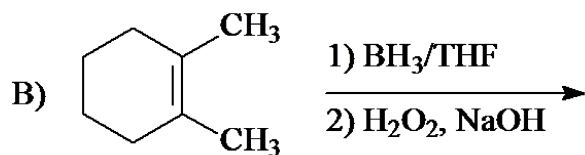
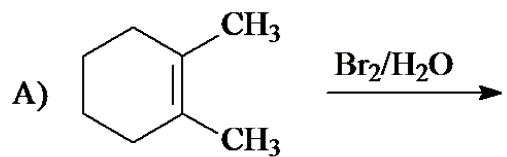
- only 1 and 2
- only 1 and 3
- only 2 and 3
- 1, 2 and 3

10. Which of the following reactions occurs by a one-step mechanism as opposed to a two-step mechanism?



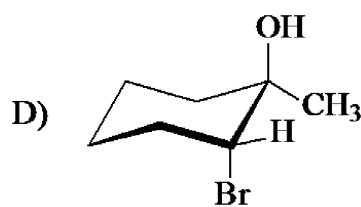
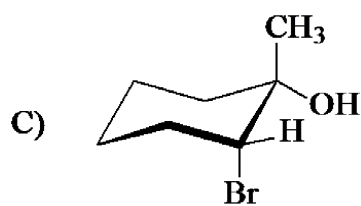
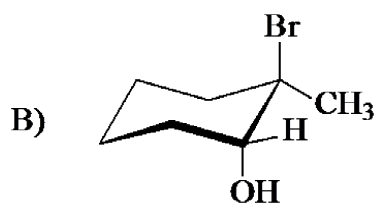
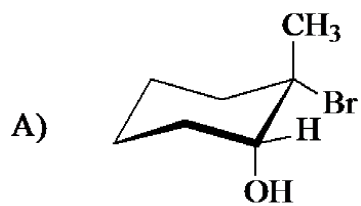
- A. A
- B. B
- C. C
- D. D

11. Which reaction proceeds by an overall net *anti* addition?



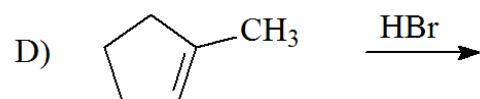
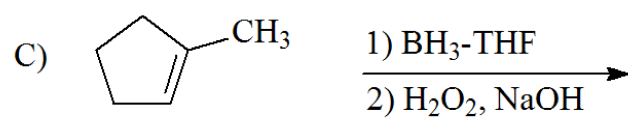
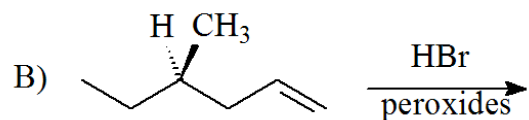
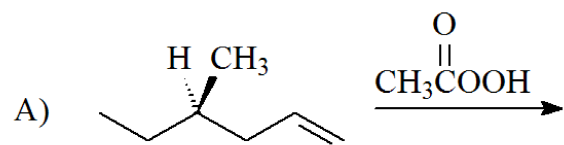
- A. A
- B. B
- C. C
- D. D

12. Addition of Br₂ and H₂O to 1-methylcyclohexene gives:



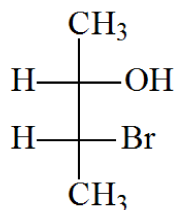
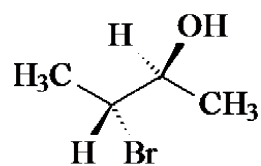
- A. A
- B. B
- C. C
- D. D

13. Which reaction below gives only enantiomers of a chiral product?

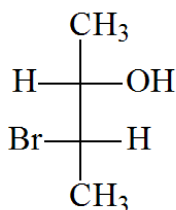


- A. A
- B. B
- C. C
- D. D

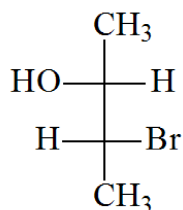
14. Which of the following Fischer projections corresponds to the compound shown below?



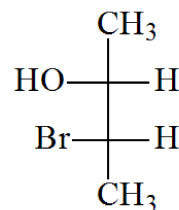
A)



B)



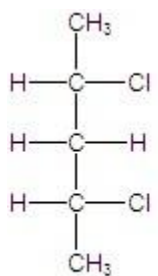
C)



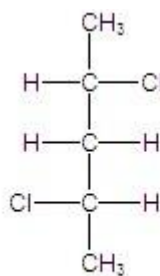
D)

- A. A
- B. B
- C. C
- D. D

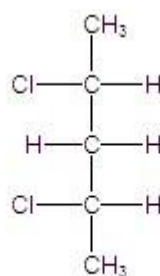
15. Identify all configurational isomers.



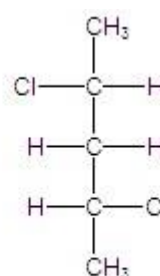
A



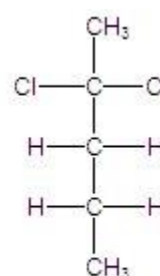
B



C



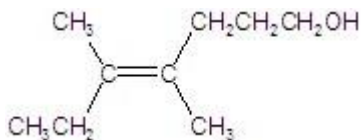
D



E

- A) B and D, A and C
- B) B and D
- C) A and B, A and D, B and C, C and D
- D) B and D, A and B, A and D, B and C, C and D

16. Name the structure. NB - The alcohol takes priority over the olefin.



- A) *cis*-4,5-dimethyl-4-hepten-1-ol
- B) *trans*-3,4-dimethyl-3-hepten-7-ol
- C) *cis*-3,4-dimethyl-3-hepten-7-ol
- D) *trans*-4,5-dimethyl-4-hepten-1-ol
- E) *trans*-4,5-dimethyl-4-heptenol

17. Identify the products of *cis*-3-methyl-3-hexene with hydrogen bromide.

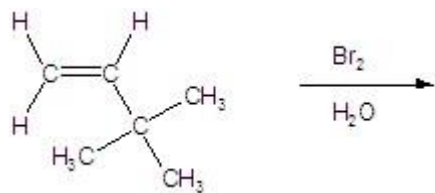
- A) (2*R*, 3*S*)-3-bromo-3-methylhexane
- B) (2*R*, 3*R*)-3-bromo-3-methylhexane
- C) (2*S*, 3*R*)-3-bromo-3-methylhexane
- D) (2*S*, 3*S*)-3-bromo-3-methylhexane
- E) All of the above answers

18. What configurations are found in the product(s) of the reaction below?

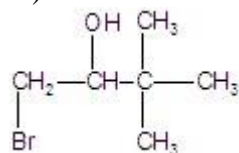


- A) 1*R*,2*R* only
- B) 1*S*,2*S* only
- C) 1*R*,2*S* only
- D) an equal mixture of 1*R*,2*R* and 1*S*,2*S*
- E) an equal mixture of 1*R*,2*R* and 1*R*,2*S*

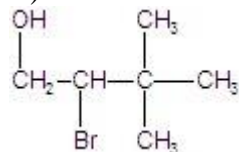
19. Provide the major organic product in the reaction below.



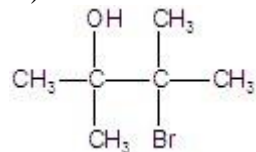
A)



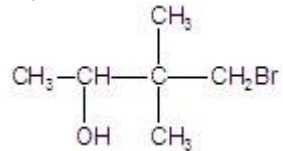
B)



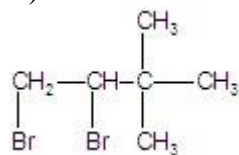
C)



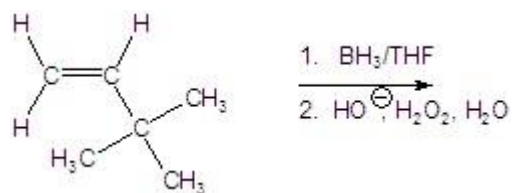
D)



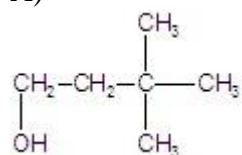
E)



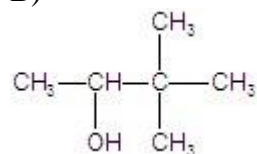
20. Provide the major organic product in the reaction below.



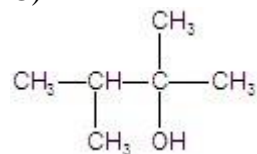
A)



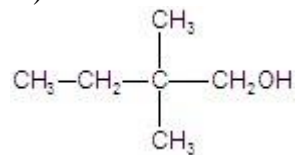
B)



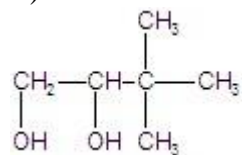
C)



D)



E)



Exam #2 Chem 2410
Answer Section

MULTIPLE CHOICE

1. D
2. B
3. A
4. C
5. A
6. C
7. A
8. C
9. A
10. B
11. A
12. D
13. C
14. A
15. D
16. D & E
17. All are correct
18. D
19. A
20. A