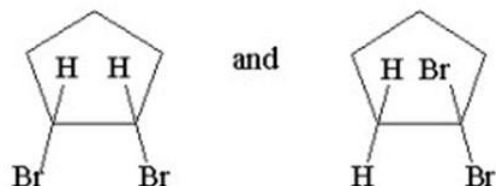


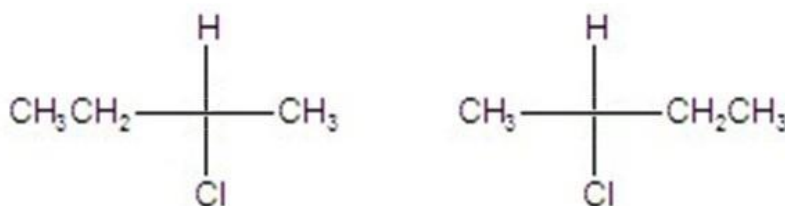
CHE 251 - Practice Test Questions – Exam 2 – Chapters 4,5,6

1. What is the relationship between the following compounds?



- A) diastereomers  
B) constitutional isomers; C) conformers  
D) configurational isomers; E) enantiomers

2. What is the relationship between the following compounds?

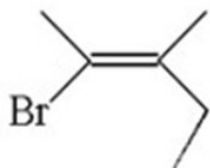


- A) identical compounds; B) conformational isomers; C) constitutional isomers  
D) configurational isomers; E) diastereomers

3. Which of the following can have cis-trans isomers?

- A) 1-butene; B) 1-pentene; C) cyclohexene; D) ethane; E) 2-butene

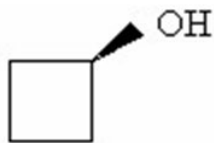
4. Does the following compound have the *E* or *Z* configuration?



5. Which of the following compounds are not chiral?

- A) 2,3-dibromobutane; B) 1,3-dibromobutane; C) 1,2-dichlorobutane  
D) 1,4-dibromobutane; E) 1-bromo-2-chlorobutane

6. Is the compound shown below chiral or achiral?

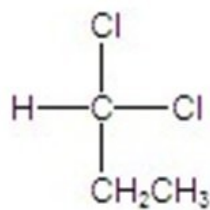


7. How many asymmetric centers does 2,4,6-trimethylheptane have?

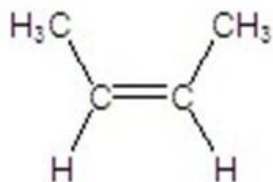
- A) 0; B) 1; C) 2; D) 3; E)

8. Which of the following compounds have an asymmetric center?

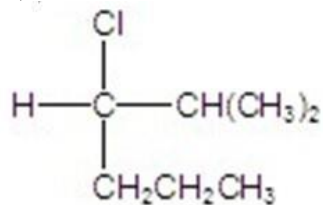
A)



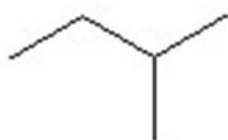
B)



C)



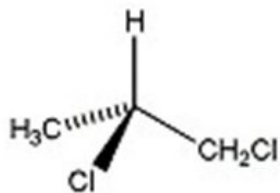
D)



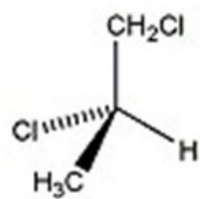
E)



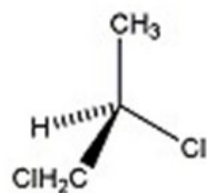
9. Which of the following is the enantiomer of the compound shown below?



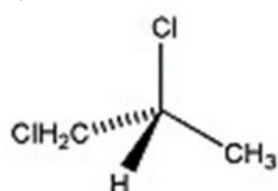
A)



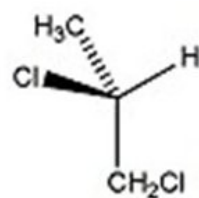
B)



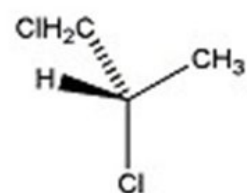
C)



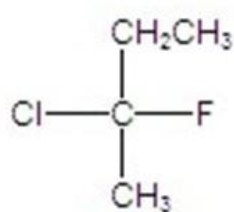
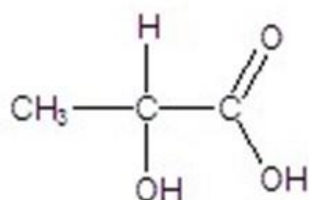
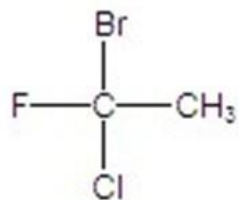
D)



E)



10. What is the configuration of the asymmetric center in each of the following compounds?



A) *S, S, R*

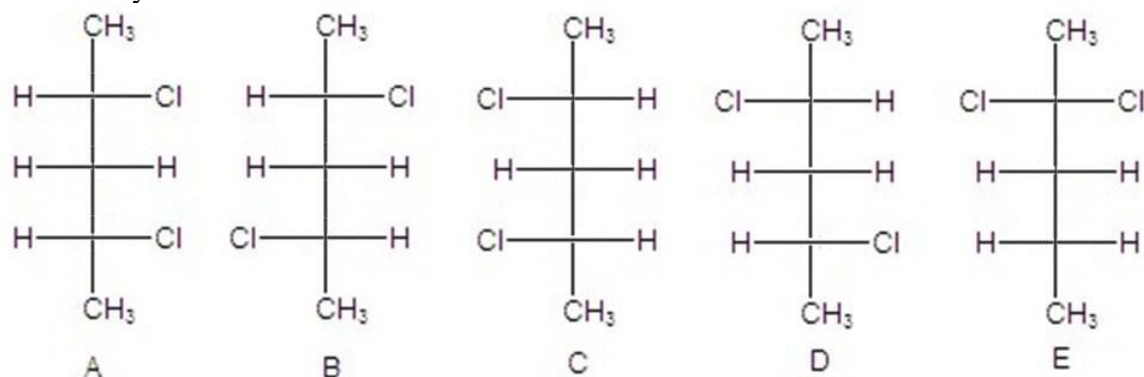
B) *S, R, S*

C) *R, S, S*

D) *S, S, S*

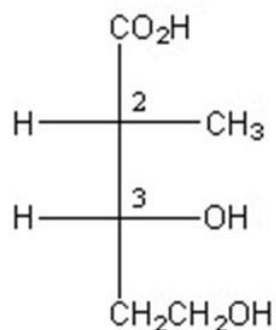
E) *R, R, R*

11. Identify enantiomers.



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

12. What is the configuration of the asymmetric centers in the compound shown below?

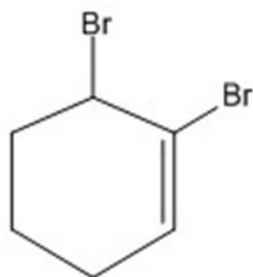


- A) 2*R*, 3*R*  
 B) 2*R*, 3*S*  
 C) 2*S*, 3*R*  
 D) 2*S*, 3*S*  
 E) cannot be determined from the structure

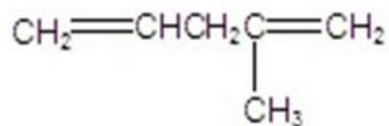
13. What is the degree of saturation of a hydrocarbon with molecular formula  $\text{C}_{20}\text{H}_{34}$ ?

- A) 2  
 B) 3  
 C) 4  
 D) 5  
 E) 6

14. Name the following compound:

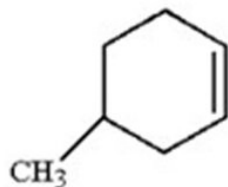


15 Name the following compound:



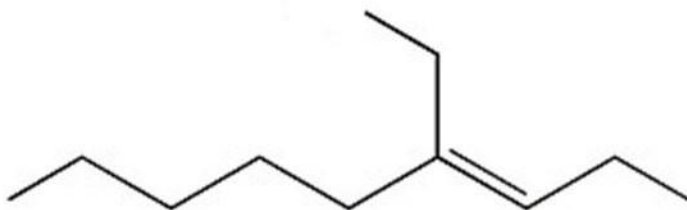
- A) 2-methyl-2,4-pentadiene
- B) 4-methyl-1,4-pentadiene
- C) 2-methylene-4-pentene
- D) 4-methylene-2-pentene
- E) 2-methyl-1,4-pentadiene

16. What is the name of the following compound?



- A) 5-methylcyclohexene
- B) 4-methylcyclohexene
- C) 1-methyl-3-cyclohexene
- D) 1-methyl-4-cyclohexene
- E) methylcyclohexene

17. Name the following compound. Include *E* or *Z*, if necessary.

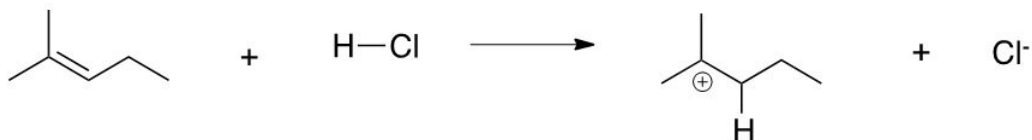


18. Draw curved arrows to show how  $\text{CH}_3\text{CH}=\text{CHCH}_3$  reacts with  $\text{HBr}$  to form a carbocation.  
Answer:

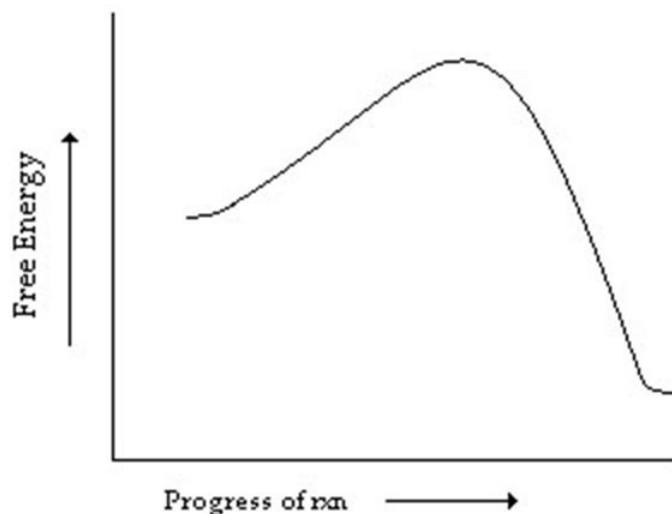
19. Which are nucleophiles and which are electrophiles?

$\text{-OH}$ ,  $\text{BH}_3$ ,  $\text{H}_2\text{O}$ ,  $\text{+CH}_3$ ,  $\text{NH}_3$ ,  $\text{Br}^-$

20. Using curved arrows, show the movement of electrons in the following reaction step:

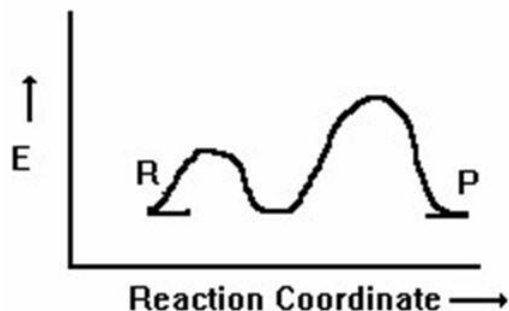


21. Which of the following correctly describes the reaction whose reaction coordinate diagram is shown?



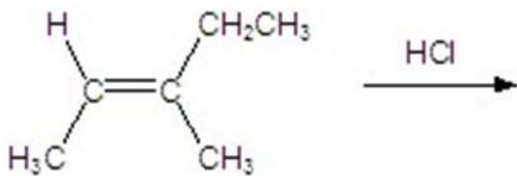
- A) endergonic with no transition state
- B) exergonic with no transition state
- C) endergonic with a transition state
- D) exergonic with a transition state
- E) endergonic with an intermediate

22. How many transition states are in the following reaction coordinate diagram?



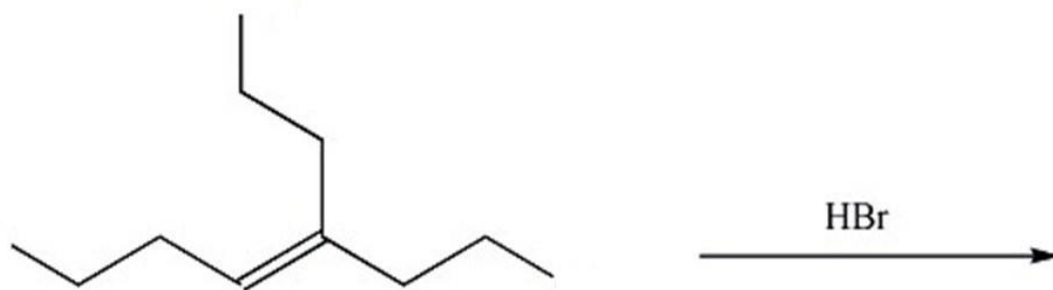
- A) 3
- B) 4
- C) 5
- D) 2
- E) 1

23. Draw the major product of the following reaction:



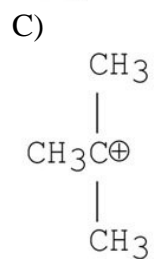
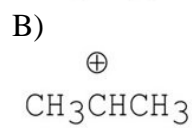
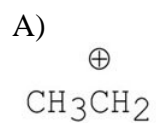
Answer:

24. Draw the major product of the following reaction:

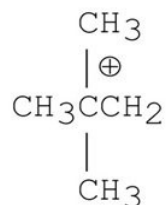


Answer:

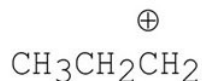
24. Which of the following carbocations is the most stable?



D)



E)



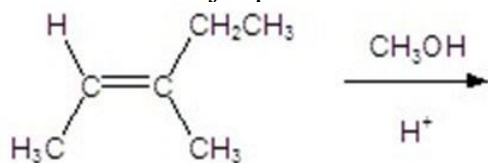
25. A reaction in which a mixture of two constitutional isomers is obtained but more of one is formed than of the other is called a

- A) regioselective reaction.
- B) regiospecific reaction.
- C) stereospecific reaction.
- D) stereoselective reaction.
- E) successful reaction.

26. What is the major product obtained from the acid-catalyzed hydration of 2-methyl-2-pentene?

- A) 2-methylpentane
- B) 2-methyl-1-pentanol
- C) 2-methyl-2-pentanol
- D) 2-methyl-3-pentanol
- E) 1-methoxypentane

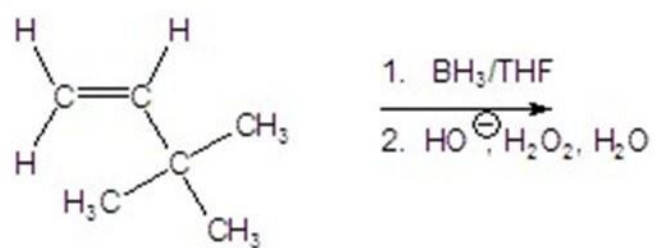
27. Draw the major product of the following reaction:



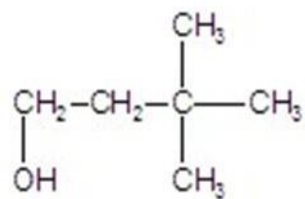
Answer:



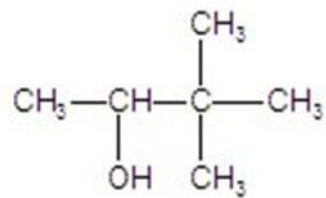
28. What is the major product of the following reaction?



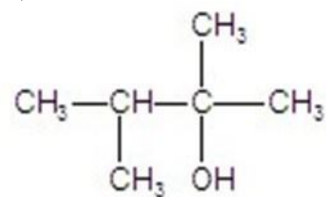
A)



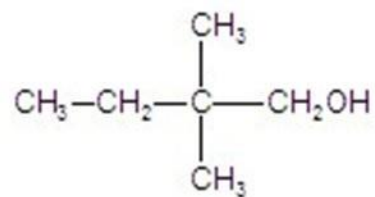
B)



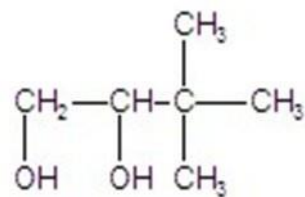
C)



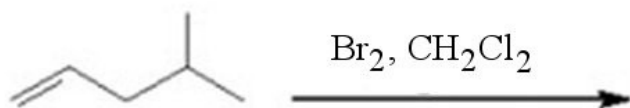
D)



E)

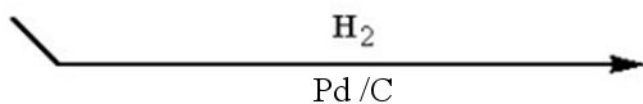
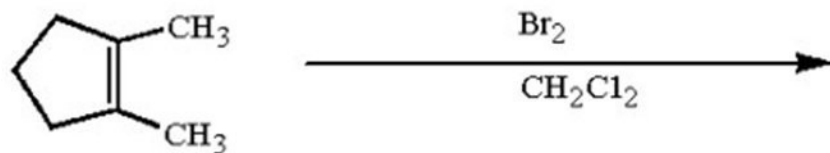


29. Draw the major product of the following reaction:



Answer:

30. Draw the products (including their stereochemistry) of the following reactions:



Answer: