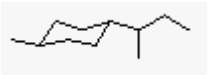
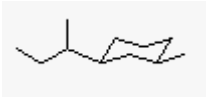
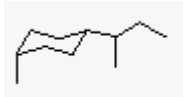
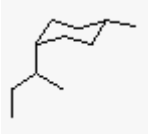
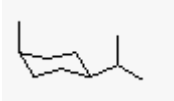
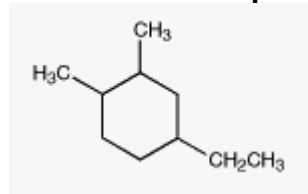


Organic Chemistry(I) Chapter 4

1. What is the most stable conformation of *cis* -1-sec-butyl-4-methylcyclohexane?

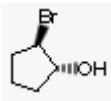
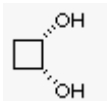
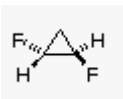
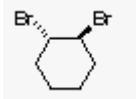
- A. 
- B. 
- C. 
- D. 
- E. 

2. What would be the *best* name for the following compound? (Neglect any *cis-trans* isomerism that is possible.)

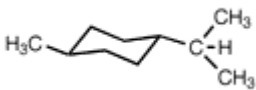
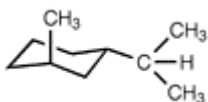
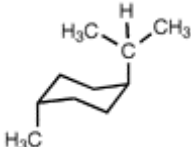
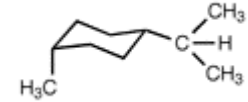
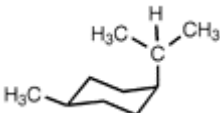


- A. 1-ethyl-3,4-dimethylcyclohexane
- B. 3-ethyl-1,6-dimethylcyclohexane
- C. 1-ethyl-4,5-dimethylcyclohexane
- D. 5-ethyl-1,2-dimethylcyclohexane
- E. 4-ethyl-1,2-dimethylcyclohexane

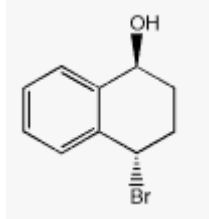
3. Which of the following structures can be described as *cis* ?

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

4. Which conformation of *cis* -1-iso-propyl-4-methylcyclohexane would be of the lowest energy?

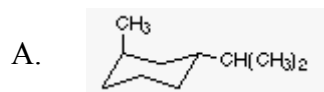
- A. 
- B. 
- C. 
- D. 
- E. 

5. How many hydrogen atoms exist but *are not* shown in the following structure?

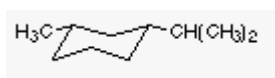


- A. 2 B. 4 C. 6 D. 10 E. 12

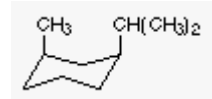
6. What is the lowest energy stereoisomer of *cis*-1-isopropyl-3-methylcyclohexane?



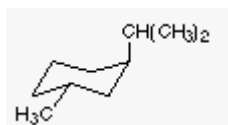
B.



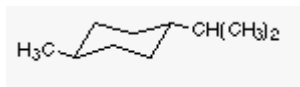
C.



D.



E.



7. Which of the following most accurately illustrates the correct geometry of the axial and equatorial bonds in the chair conformation of cyclohexane?

A.



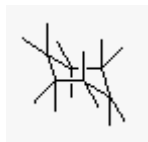
B.



C.



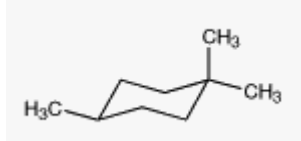
D.



E.

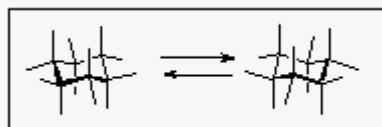


8. How many axial hydrogens are present in the following molecule?



- A. two B. three C. four D. five E. six

9. The chair flip that interconverts cyclohexane conformers (see following illustration) requires how much energy?



- A. 0 kcal/mole B. 5.4 kcal/mole C. 9.6 kcal/mole
D. 10.8 kcal/mole E. 15 kcal/mole

10. Which one of the following statements is incorrect?

- A. Cyclopropane has a higher heat of combustion than does cyclohexane.
- B. Cyclopentane is destabilized somewhat by torsional (eclipsing) interactions.
- C. Cyclohexane exists predominantly in an all-staggered conformation.
- D. Cyclopropane is destabilized by both angle strain and torsional (eclipsing) interactions.
- E. Cyclobutane has a higher heat of combustion per CH_2 group than does cyclohexane.

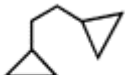
11. Which of the following definitions most accurately describes stereo-isomers?

- A. compounds that differ from one another by one bond rotations
- B. compounds that differ from one another as a result of differences in spatial orientation that are caused by altering their connectivity (one structure compared with the other)
- C. compounds that have exactly the same connectivity but differ in the arrangement of their atoms in space
- D. compounds that are very similar in structure but contain several different functional groups
- E. compounds that have the same number of carbon atoms but differ because one of them is acyclic (no ring) and the other is cyclic (contains a ring)

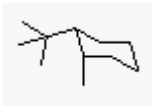
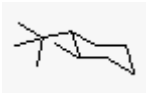
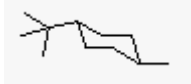
12. Which of the following cyclic alkanes is the most stable (i.e., lowest energy)?

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

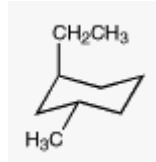
13. Which of the following isomers of the formula C_8H_{14} would you expect to give the highest heat of combustion?

- A.  B.  C.  D.  E. 

14. What is the most stable conformation of *trans*-1-*tert*-butyl-2-methylcyclohexane?

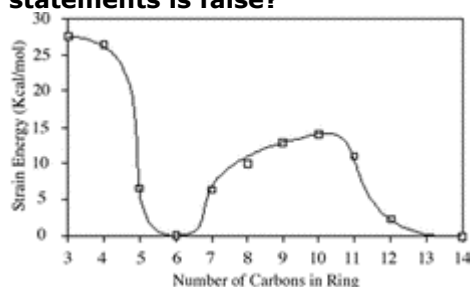
- A.  B.  C.  D.  E. 
-

15. What is the correct IUPAC name for the following molecule?



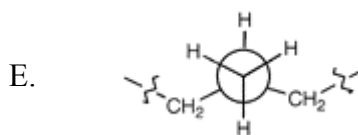
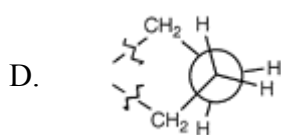
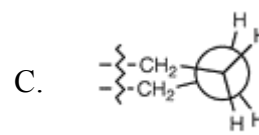
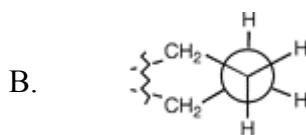
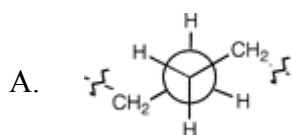
- A. *trans* -3-methyl-5-ethylcyclohexane C. *trans* -1-ethyl-3-methylcyclohexane
- B. *cis* -3-methyl-5-ethylcyclohexane D. *cis* -1-ethyl-3-methylcyclohexane
- E. *trans* -1-methyl-3-ethylcyclohexane

16. Consider the graph of total strain energy versus ring size. Which of the following statements is false?



- A. Among the smaller ring sizes, six-membered rings are the most stable.
- B. Medium-sized rings (7-11 carbons) are less stable than larger rings.
- C. Five-membered rings have about the same strain energy as seven-membered rings.
- D. Four-membered rings are significantly more stable than three-membered rings.
- E. Ten-membered rings are the least stable of the medium-sized rings (7-11 carbons).

17. Which of the following would be the Newman projection of a C-C bond in chair cyclohexane?



18. In the following chair conformation of methylcyclohexane, which hydrogen (indicated by arrows) causes the greatest steric strain with the axial methyl group? This conformation (with the methyl group occupying an axial orientation) is less stable than the conformation in which the methyl group is equatorial.

