CHEM 2321 Exam 1 Name:

September 26, 2023 UTEP ID #:

If required, the Exam 1 retake homework will be due Friday, September 29, before 5 pm through <http://organic.utep.edu/quiz>, no exceptions or excuses. Put your name on these sheets so that you can recover your class answers. Expect an email from me this evening.

The compound to the right is for questions 1-10.

1. How many carbons does the given compound have?
2. 21 b. 22 c. 23 d. 24 e. not a.-d.
3. How many methines does the given compound have?
4. 7 b. 8 c. 9 d. 10 e. not a.-d.
5. How many primary carbons does the given compound have?
6. 11 b. 12 c. 13 d. 14 e. not a.-d.
7. How many primary methines does the given compound have?
8. 1 b. 2 c. 3 d. 4 e. not a.-d.
9. How many unsaturations are in the given compound?
10. 7 b. 8 c. 9 d. 10 e. not a.-d.
11. How many unsaturated nitrogens are in the given compound?
12. 1 b. 2 c. 3 d. 4 e. not a.-d.
13. How many trigonal carbons are in the compound?
14. 16 b. 17 c. 18 d. 19 e. not a.-d.
15. How many sp3 hybridized carbons are in the compound?
16. 7 b. 8 c. 9 d. 10 e. not a.-d.
17. What is the ideal absolute angle between two sigma bonds to the nitrogen that the arrow is pointing to?
18. 90° b. 109.5° c. 120° d. 180° e. not a.-d.
19. How many hydrogens does the given compound have?
20. 22 b. 24 c. 26 d. 28 e. not a.-d.
21. ­A bond is when electrons in adjacent p orbitals move in opposite directions.

a. s b. s anti c. p d. p anti e. not a.-d.



1. Considering resonance structures, which bond is 1.3 Å (Angstroms) long?



1. The following compound is cyclic? The five dark bonds are in the front of this perspective representation and do not overlap with the regular bonds behind them. (Hint: Use the formula!)
2. hepta b. octa c. nona d. deca e. not a.-d.
3. How many sigma bonds does the following compound have?
4. 56 b. 57 c. 58 d. 59 e. not a.-d.
5. How many total bonds does the compound in question 14 have?
6. 62 b. 63 c. 64 d. 65 e. not a.-d.
7. Which Newman projection corresponds to 3-ethylpentane?
8.  b.  c.  d.  e. 
9. Given the following energies in kcal/moles (CH3/CH3 eclipsed = 4.1, CH3/H eclipsed = 1.2, H/H eclipsed = 1, CH3/CH3 gauche = 0.8), to the nearest 0.1 of a kcal/mole what is the energy difference between the following Newman projections? 
10. -0.8 b. -1.6 c. -2.4 d. -3.2 e. not a.-d.
11. What is the systematic name of the following compound?
12. 3,5-dimethyl-6-ethyl-4-propyloctane b. 4,6-dimethyl-3-ethyl-5-propyloctane

c. 6-ethyl-3,5-dimethyl-4-propyloctane d. 3-ethyl-4,6-dimethyl-5-propyloctane

e. not a.-d.

1. Which compound is a diastereomer of a *trans* compound?
2.  b.  c.  d.  e. not a.-d.
3. Chair cyclohexane still has what type of strain compared to *n*-hexane? (Hint: Look at a molecular model.)
4. torsional b. face c. angle d. not a.-c.

***Put your name and ID on your scantron and exam sheets. Show a picture ID as you turn in everything.***