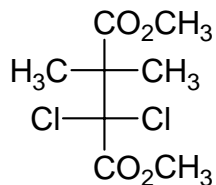


Name _____

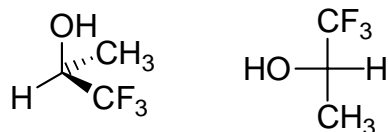
If you do not want your graded quiz placed in the box outside my office, then please tick here _____

(1 and 3-10) are True or False.

- 1) The mirror image of an achiral molecule is invisible.
- 2) Name an everyday object which is chiral (and not a part of your body or an item of clothing).
- 3) Bulky anions are bad nucleophiles because their bulk creates steric hindrance.
- 4) A favorable entropy change results from an increase in disorder.
- 5) The lower the bond dissociation energy of a bond, the easier it is to break.
- 6) This molecule is achiral.



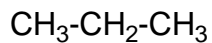
- 7) Polarizable anions make better nucleophiles than anions that are less polarizable.
- 8) These compounds are enantiomers.



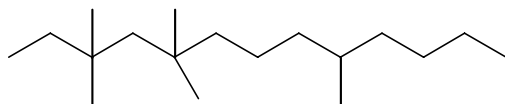
- 9) S_N1 reactions always proceed with retention of stereochemistry.
- 10) A nucleophilic substitution is a reaction where a nucleophilic species replaces another group or atom in a molecule.

11-13) Circle (or draw in) the C-H bond in each molecule that has the lowest bond dissociation energy:

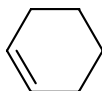
11)



12)



13)

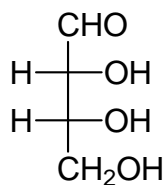


14) What is the term given to a molecule that contains at least one chiral center but is overall achiral?

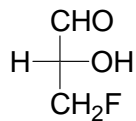
15) Give two characteristics of an E1 process.

16) After a carbocation has been formed, four possible things can happen: name two.

17) Assign (R) or (S) configuration to any chiral centers in the below molecule.



18) Redraw this compound using sticks and wedges.



19) What is the difference between BASICITY and NUCLEOPHILICITY?

20) What is a free radical?

BONUS QUESTION for 1 extra point

Why are eliminations favored over substitutions at higher temperatures?

Name

DUNN LAK - GRAYDON

If you do not want your graded quiz placed in the box outside my office, then please tick here _____

(1 and 3-10) are True or False.

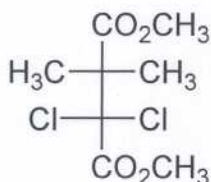
- 1) The mirror image of an achiral molecule is invisible. **F**
- 2) Name an everyday object which is chiral (and not a part of your body or an item of clothing). *golf club, corkscrew, scissors, ^{american} car, spring, spiral staircase*

- 3) Bulky anions are bad nucleophiles because their bulk creates steric hindrance. **T**

- 4) A favorable entropy change results from in increase in disorder. **T**

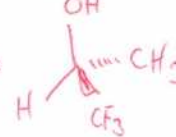
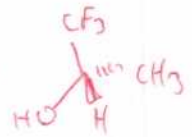
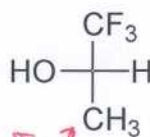
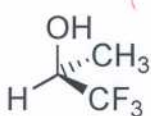
- 5) The lower the bond dissociation energy of a bond, the easier it is to break. **T**

- 6) This molecule is achiral. **T**



- 7) Polarizable anions make better nucleophiles than anions that are less polarizable. **T**

- 8) These compounds are enantiomers. **F**



- 9) $\text{S}_{\text{N}}1$ reactions always proceed with retention of stereochemistry. **F**

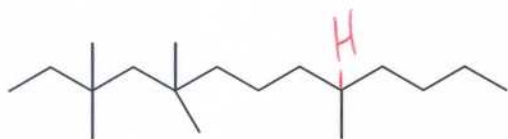
- 10) A nucleophilic substitution is a reaction where a nucleophilic species replaces another group or atom in a molecule. **T**

11-13) Circle (or draw in) the C-H bond in each molecule that has the lowest bond dissociation energy:

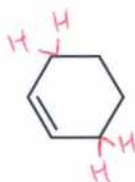
11)



12)



13)



14) What is the term given to a molecule that contains at least one chiral center but is overall achiral?

MESO

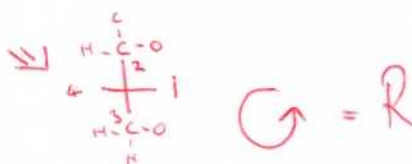
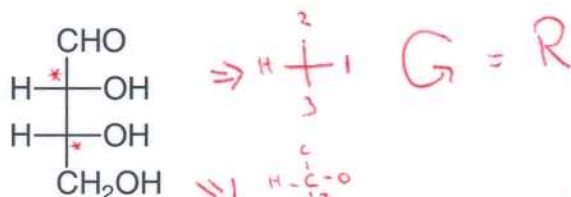
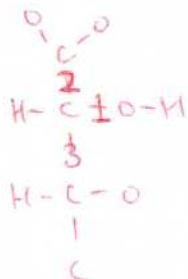
15) Give two characteristics of an E1 process.

- Elimination
- Unimolecular R.D.S.
- Base strength unimportant
- Ionizing solvent preferred
- Possible cation rearrangements
- Saytzeff Orientation Observed
- No special geometry required.

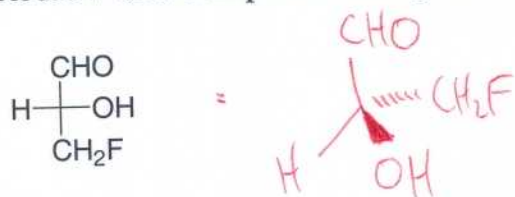
16) After a carbocation has been formed, four possible things can happen: name two.

- React with leaving group → Starting Material
- React with a Nucleophile → substitution product
- React with a base, lose a H^+ → Elimination Product
- Rearrange.

17) Assign (R) or (S) configuration to any chiral centers in the below molecule.



18) Redraw this compound using sticks and wedges.



19) What is the difference between BASICITY and NUCLEOPHILICITY?

Basicity involves the equilibrium constant for removal of a H^+ .

Nucleophilicity involves the rate of attack on an electrophile.

20) What is a free radical?

A free radical is a species with single unpaired valence electron.

BONUS QUESTION for 1 extra point

Why are eliminations favored over substitutions at higher temperatures?

$\Delta G = \Delta H - T\Delta S$ - Thus as the temperature increases, the entropy term becomes more significant.

Eliminations are entropically favorable since they generate more discrete species - i.e. create disorder.



two species \rightarrow 3 species

Substitutions are reactions that show little or no entropic change.