

NAME: _____

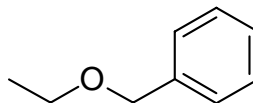
If you object to your graded script being placed in a box outside my office then check here _____

(1-10) are True or False.

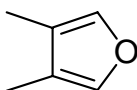
- 1) Benzene is chemically less reactive than hexa-1,3,5-triene.
- 2) All organic compounds are either aromatic or anti-aromatic.
- 3) 1,3-Butadiene contains 4 sp^2 -hybridized carbons.
- 4) Kinetic products are always formed more quickly than thermodynamic products.
- 5) An epoxide is a three membered non-aromatic heterocycle.

6)

The oxygen atom in this ether is sp^2 hybridized

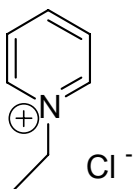


7)



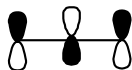
is aromatic

8)



is aromatic

9)

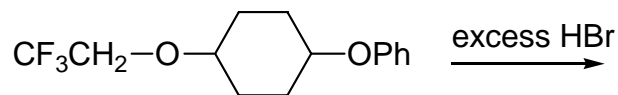


represents a non-bonding Molecular Orbital

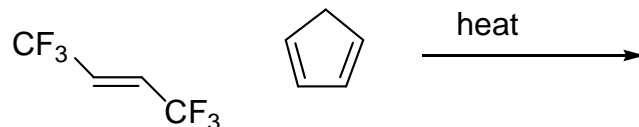
- 10) Concerted thermal [2+2] cycloadditions are allowed but thermal concerted [4+2] cycloadditions are forbidden.

11-14) Give the products for the following reactions (and indicate stereo/regiochemistry where applicable).

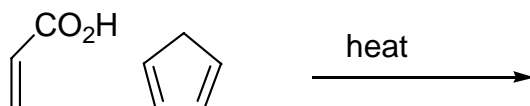
11)



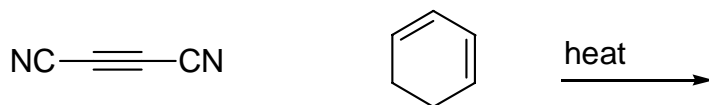
12)



13)

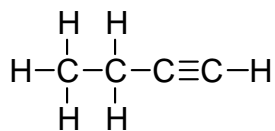


14)



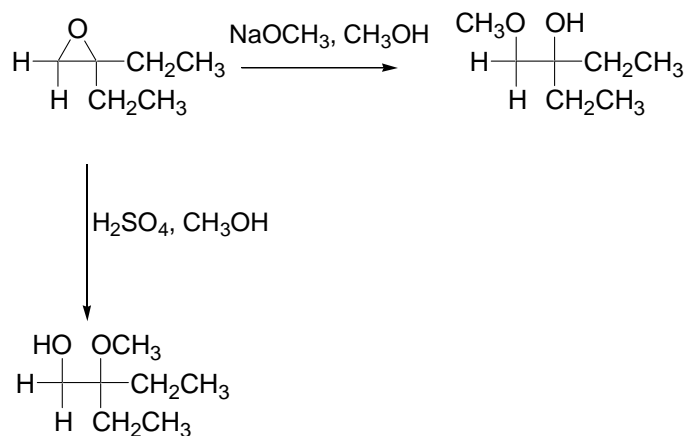
15) Give two reasons why you are taught about Molecular Orbital Theory?

16) Circle the C-H bond that has the lowest bond dissociation energy.



17) Asterix (*) the most acidic hydrogen.

18-20) Explain why nucleophilic ring opening of the below epoxide occurs with different regiochemistry in the two examples below.



BONUS QUESTION for up to 2 extra points

What *proof* do we have that benzene is really planar, and that all the bond angles and bond lengths are the same?

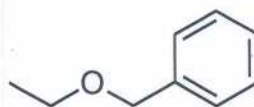
NAME: DANIEL SOLOW

If you object to your graded script being placed in a box outside my office then check here _____

(1-10) are True or False.

- 1) Benzene is chemically less reactive than hexa-1,3,5-triene. T
- 2) All organic compounds are either aromatic or anti-aromatic. F
- 3) 1,3-Butadiene contains 4 sp^2 -hybridized carbons. T
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6)

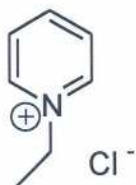
The oxygen atom in this ether is sp^2 hybridized

7)



is aromatic

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is aromatic

9)



represents a non-bonding Molecular Orbital

ANTI BONDING

- 10) Concerted thermal [2+2] cycloadditions are allowed but thermal concerted [4+2] cycloadditions are forbidden. F

11-14) Give the products for the following reactions (and indicate stereo/regiochemistry where applicable).

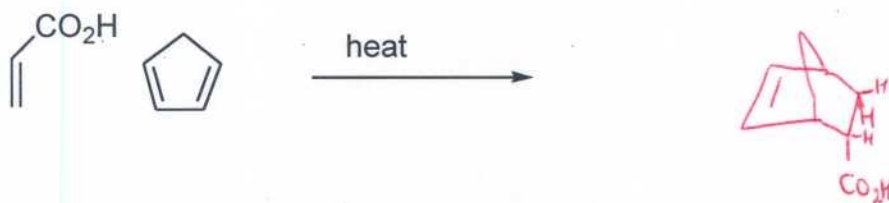
11)



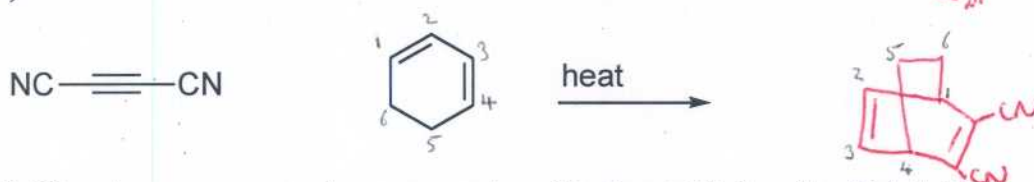
12)



13)



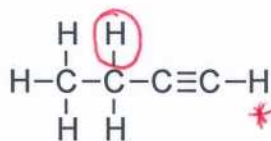
14)



15) Give two reasons why you are taught about Molecular Orbital Theory?

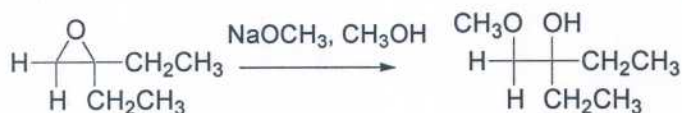
- Explains aromaticity
- Explains pericyclic reactions
- Explains delocalised π bonding, etc

16) Circle the C-H bond that has the lowest bond dissociation energy.

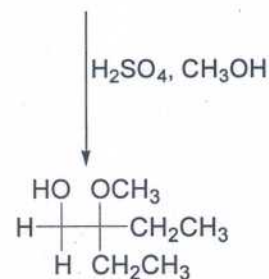
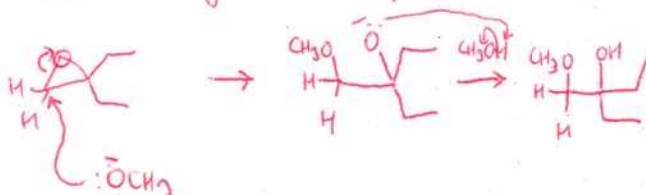


17) Asterix (*) the most acidic hydrogen.

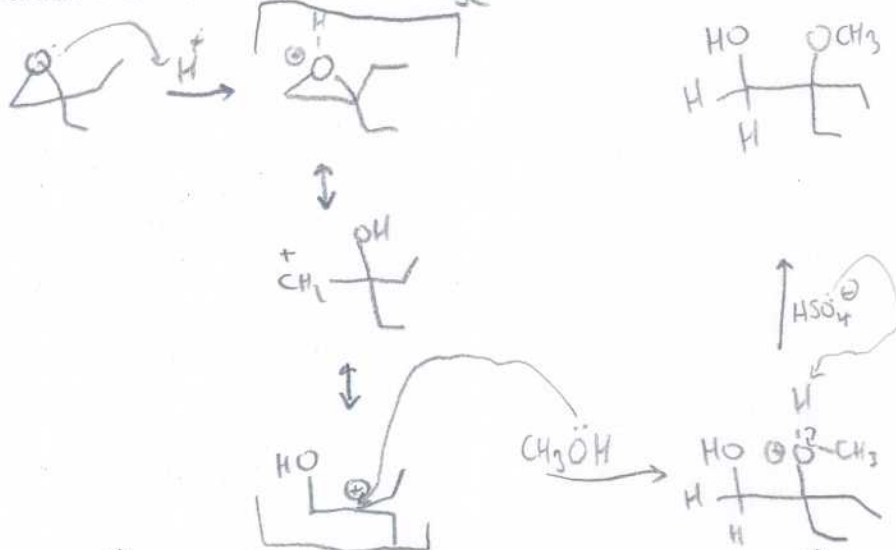
18-20) Explain why nucleophilic ring opening of the below epoxide occurs with different regiochemistry in the two examples below.



This is direct nucleophilic attack on the least sterically hindered epoxide carbon.



Here the epoxide is protonated first, and then the nucleophile attacks the carbon with the most +ve charge



BONUS QUESTION for up to 2 extra points

What *proof* do we have that benzene is really planar, and that all the bond angles and bond lengths are the same?

X Ray Crystallography; Spectroscopies such as NMR, IR