CHEM 2324 Exam 2 ***Version A*** Name:

March 26, 2019 UTEP ID #:

If required, the Exam 2 retake homework will be due Friday, March 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.

1.-5. Match each pair of compounds on the left and their corresponding melting points (m.p.) or boiling points (b.p.) in °C to the major reason why they increase. Answers may be repeated. All answers should begin with more….

1. (CH3CH2)2O (b.p. 35), butan-1-ol (b.p. 118)
2. 2,2,4-trimethylpentane(the 100 % octane standard in gasoline, m.p. -107), heptane (m.p. -91)
3. heptane (the 0 % octane standard in gasoline, b.p. 98), 2,24-trimethylpentane (b.p. 99)
4. octane (m.p. -57), cubane (m.p. 130)
5. CH3SH (the smell of natural gas, b.p. 6), methanol (b.p. 65)
6. weight b. polar bonds c. rotational symmetry d. van der Waal interactions e. hydrogen bonds
7. Using the estimate that we learned in class, which compound has the closest density to that of water?

Assume C = 12, H = 1, N = 14, O = 16

a.  b.  c.  d.  e. 

1. Based on your density estimate, the correct answer to the previous question should?

a. dissolve in water b. emulsify with water c. float in water d. sink in water e. not a.-d.

1. Given that 100 mg of a compound with pKow 1.2 is dissolved in 100 mL of octan-1-ol. To the nearest hundred of a gram, how much compound is extracted into 10 mL of water when mixed in a separatory funnel?

a. 0.02 b. 0.04 c. 0.06 d. 0.08 e. not a.-d.

1. To nearest whole number, what is the pH of a 2 M solution of a compound with pKa of 4.3?

a. 2 b. 4 c. 6 d. 8 e. not a.-d.

1. Given the following pKa’s and initial concentration of reactants, to the nearest tenth, how much chloride is made in the following reaction? Charges are not shown.



a. 0.2 b. 0.4 c. 0.6 d. 0.8 e. not a.-d.

1. What is the strongest Bronsted acid in the previous question?

a.  b.  c.  d.  e. not a.-d.

12.-15. Predict which compound is most acidic from the following pairs of compounds. Answer may be repeated. Charges are not shown.

1. or(ignore sterics) a. the first compound
2. methanol or ethanol b. the second compound
3. or  c. both compounds have equal acidity
4. water or hydrogen sulfide (H2S, rotten egg smell) d. cannot be predicted

16.-19. Match each reaction on the left to a classification on the right. Answers may be repeated. Charges are not shown.

1.  a. addition
2.  b. elimination
3.  c. substitution
4.  d. not a.-d.

20.-22. Match each reaction on the left to a net carbon redox type on the right. Answers may be repeated.

1.  a. oxidation
2. The reaction of question 17. b. reduction
3. The reaction of question 18. c. not a net redox of carbon
4. The correct name of the following compound is? 

a. *cis*-6-methylbicyclo[0.4.4]decane b. *trans*-6-methylbicyclo[0.4.4]decane

c. *cis*-1-methylbicyclo[0.4.4]decane d. *trans*-1-methylbicyclo[0.4.4]decane e. not a.-d.

1. Which structure is *syn*?

a.  b.  c.  d.  e. not a.-d.

1. Monocyclic alkenes (for example, cyclopropene, cyclobutene, etc.) up to 7 carbons are all?

a. *E* b. *R* c. *S* d. *Z* e. not a.-d.

1. The following stereoisomer of a controlled substance is? (Hint: The alcohol is the 1 carbon.)

a. (*1R, 2R*) b. (*1R, 2S*) c. (*1S, 2R*) d. (*1S, 2S*) e. not a.-d.

27. The carbon with the asterisk \* is? 

a. r b. s c. R d. S e. not a.-d.

28. The compound in the previous question is?

a. achiral but not meso b. chiral c. meso d. not a.-c.

***Do not forget to put your name, ID, and version letter (A or B) on your scantron; and your name and ID on your exam sheets. Show a picture ID as you turn in you turn everything in.***