

**Chem 250****In-class Quiz #2**

This exam is composed of **16** questions.

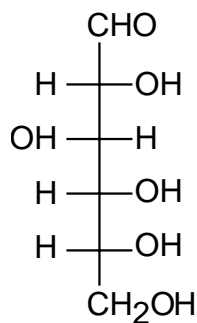
*As discussed in the course syllabus, honesty and integrity are absolute essentials for this class. In fairness to others, dishonest behavior will be dealt with to the full extent of University regulations.*

*I hereby state that all answers on this exam are my own and that I have neither gained unfairly from others nor have I assisted others in obtaining an unfair advantage on this exam.*

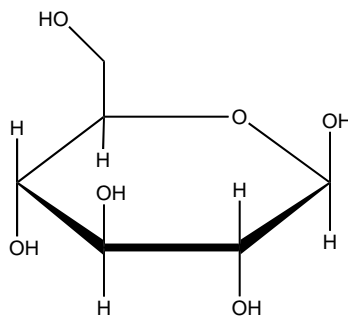
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**PERIODIC TABLE OF THE ELEMENTS**

1A	2A	3B	4B	5B	6B	7B	8B	8B	8B	1B	2B	3A	4A	5A	6A	7A	8A
1 <b>H</b> 1.008																	2 <b>He</b> 4.003
3 <b>Li</b> 6.939	4 <b>Be</b> 9.012											5 <b>B</b> 10.81	6 <b>C</b> 12.01	7 <b>N</b> 14.01	8 <b>O</b> 16.00	9 <b>F</b> 19.00	10 <b>Ne</b> 20.18
11 <b>Na</b> 22.99	12 <b>Mg</b> 24.31											13 <b>Al</b> 26.98	14 <b>Si</b> 28.09	15 <b>P</b> 30.97	16 <b>S</b> 32.07	17 <b>Cl</b> 35.45	18 <b>Ar</b> 39.95
19 <b>K</b> 39.10	20 <b>Ca</b> 40.08	21 <b>Sc</b> 44.96	22 <b>Ti</b> 47.90	23 <b>V</b> 50.94	24 <b>Cr</b> 52.00	25 <b>Mn</b> 54.94	26 <b>Fe</b> 55.85	27 <b>Co</b> 58.93	28 <b>Ni</b> 58.71	29 <b>Cu</b> 63.55	30 <b>Zn</b> 65.39	31 <b>Ga</b> 69.72	32 <b>Ge</b> 72.61	33 <b>As</b> 74.92	34 <b>Se</b> 78.96	35 <b>Br</b> 79.90	36 <b>Kr</b> 83.80
37 <b>Rb</b> 85.47	38 <b>Sr</b> 87.62	39 <b>Y</b> 88.91	40 <b>Zr</b> 91.22	41 <b>Nb</b> 92.91	42 <b>Mo</b> 95.94	43 <b>Tc</b> (99)	44 <b>Ru</b> 101.1	45 <b>Rh</b> 102.9	46 <b>Pd</b> 106.4	47 <b>Ag</b> 107.9	48 <b>Cd</b> 112.4	49 <b>In</b> 114.8	50 <b>Sn</b> 118.7	51 <b>Sb</b> 121.8	52 <b>Te</b> 127.6	53 <b>I</b> 126.9	54 <b>Xe</b> 131.3
55 <b>Cs</b> 132.9	56 <b>Ba</b> 137.3	57 <b>La</b> 138.9	72 <b>Hf</b> 178.5	73 <b>Ta</b> 181.0	74 <b>W</b> 183.8	75 <b>Re</b> 186.2	76 <b>Os</b> 190.2	77 <b>Ir</b> 192.2	78 <b>Pt</b> 195.1	79 <b>Au</b> 197.0	80 <b>Hg</b> 200.6	81 <b>Tl</b> 204.4	82 <b>Pb</b> 207.2	83 <b>Bi</b> 209.0	84 <b>Po</b> (209)	85 <b>At</b> (210)	86 <b>Rn</b> (222)
87 <b>Fr</b> (223)	88 <b>Ra</b> 226.0	89 <b>Ac</b> 227.0	104 <b>Unq</b> (261)	105 <b>Unp</b> (262)	106 <b>Unh</b> (263)	107 <b>Uns</b> (262)	108 <b>Uno</b> (265)	109 <b>Une</b> (266)									

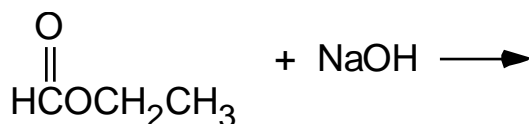


D-glucose

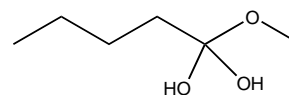
 $\beta$ -D-Glucose

- (5 points) The geometry around the carbon of a carboxylic acid group is:
  - 1) tetrahedral
  - 2) trigonal planar
  - 3) linear
  - 4) octahedral
- (5 points) In general, which is less reactive, an ester or an anhydride?
  - 1) ester
  - 2) anhydride

- (8 points) The products of the following reaction are:



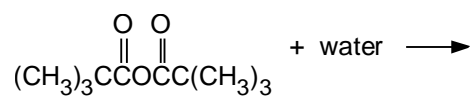
- 1) sodium propanoate and water
  - 2) sodium acetate and formaldehyde
  - 3) ethanol and sodium formate
  - 4) methane and sodium acetate
  - 5) none of the above
- (5 points) Which of the following is expected to have the highest melting point?
    - 1)  $\text{CH}_3\text{CH}_2(\text{CH}=\text{CHCH}_2)_3(\text{CH}_2)_6\text{COOH}$
    - 2)  $\text{CH}_3(\text{CH}_2)_4(\text{CH}=\text{CHCH}_2)_2(\text{CH}_2)_6\text{COOH}$
    - 3) it is not possible to predict
  - (5 points) Circle the stronger acid:  $\text{Cl}_2\text{CHCOOH}$        $\text{Cl}_3\text{CCOOH}$
  - (8 points) Which two reactants would lead to the Fischer esterification reaction intermediate shown at right?



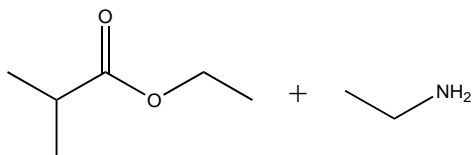
- 1) pentanal and formic acid
- 2) 1-pentanone and formic acid
- 3) pentanoic acid and methanol
- 4) hexanoic ester and water
- 5) none of the above

7. (8 points) Draw the hemiacetal structure of the product formed by reaction of ethanal with butanol.

8. (8 points) Draw the structural formula for the major organic product of the reaction below:

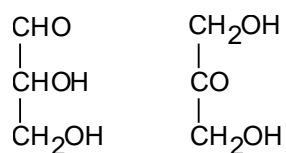


9. (8 points) Draw the structural formulas for major products of the reaction below:

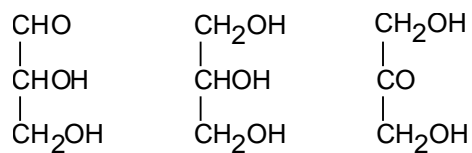


10. (8 points) Draw the structural formula for the major product of the reaction of 2,2-dimethylpropanoic acid and  $\text{LiAlH}_4$  in water:

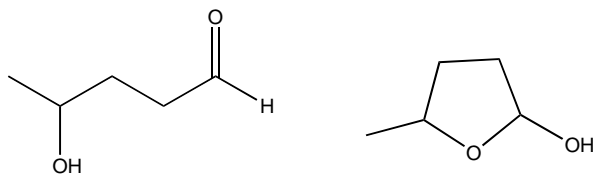
11. (5 points) Which of the following is/are ketose(s)? Circle any (or none) that apply.



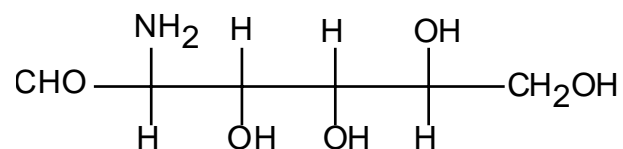
12. (5 points) Circle all of the stereocenters below (or write "none," if appropriate).



13. (5 points) Circle the more favored form of the following aldopentose in solution.



Questions 14 to 15 refer to the following molecule



14. (10 points) Draw one of the stable cyclic hemiacetals formed by the above molecule, paying attention to the stereochemistries of each atom.

15. (5 points) The above molecule is which type of sugar?

1) D-sugar      2) L-sugar

16. (2 points) What is the course number of this class?

1) 250                      2) 101                      3) 496                      4) 728