

Chem 250**In-class Quiz #2v1 Updated Key**

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

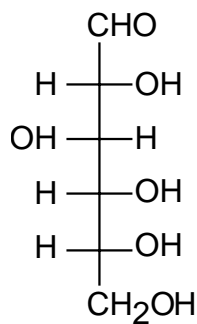
As discussed in the course syllabus, honesty and integrity are absolute essentials for this class. In fairness to others, dishonest behavior will be dealt with to the full extent of University regulations.

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.

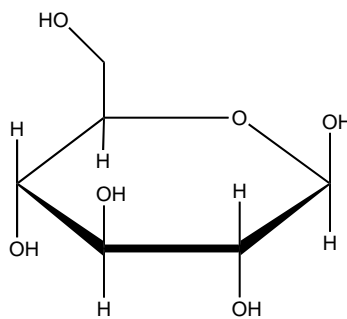
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PERIODIC TABLE OF THE ELEMENTS

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



D-glucose

 β -D-Glucose

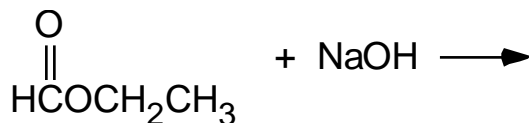
1. (5 points) The geometry around the carbon of a carboxylic acid group is:
1) tetrahedral 2) trigonal planar 3) linear 4) octahedral

(2) It's sp^2 hybridized – OWL Chptr 19

2. (5 points) In general, which is less reactive, an ester or an anhydride?
1) ester 2) anhydride

(1) ester Chptr 19

3. (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

(3) hydrolysis of an ester Chapter 19, p 480

4. (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

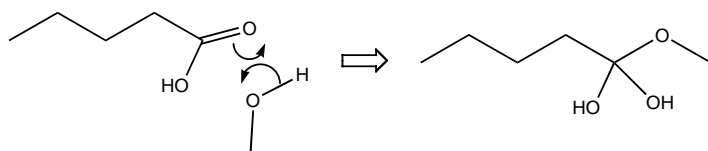
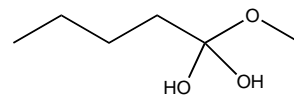
(2) less branched chain packs better and so leads to more van der Waals interactions OWL 18.4a

5. (5 points) Circle the stronger acid: Cl_2CHCOOH Cl_3CCOOH

**Cl_3CCOOH is the stronger acid, since Cl is electron-withdrawing
OWL 18.5a**

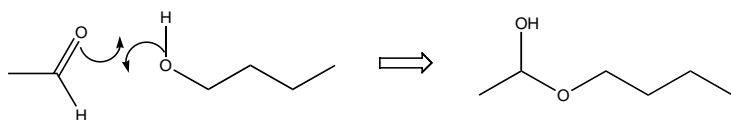
6. (8 points) Which two reactants would lead to the Fischer esterification reaction intermediate shown at right?

- 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



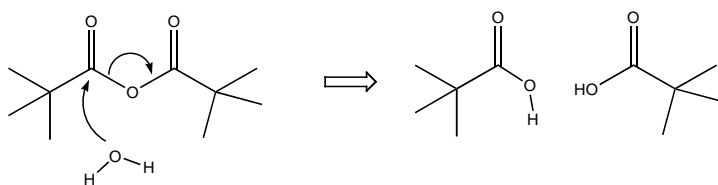
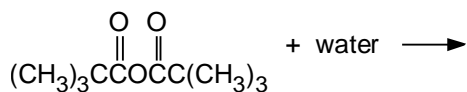
(3) OWL 18.5e

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



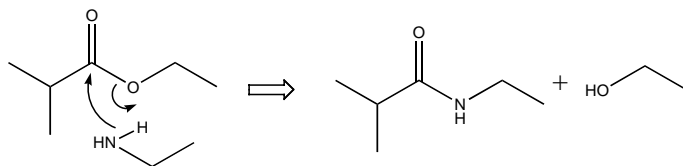
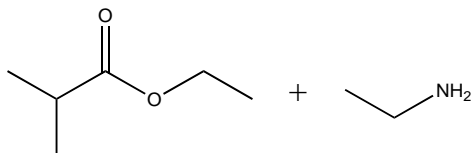
OWL 17 End of Chapter Q's - Question 9

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



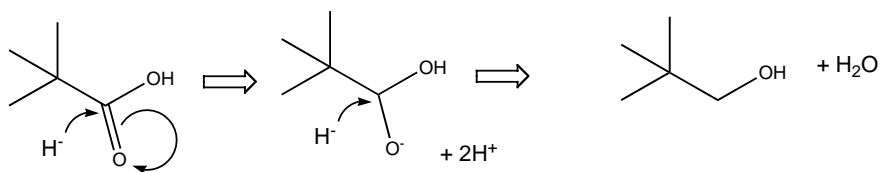
OWL 19.3b

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



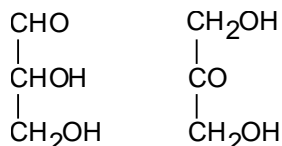
OWL 19.3d

10. (8 points) Draw the structural formula for the major product of the reaction of 2,2-dimethylpropanoic acid and LiAlH_4 in water:



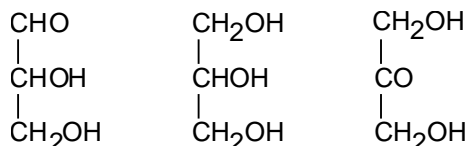
OWL 18.5d

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



The second one is - dihydroxyacetone. see p 494 and OWL 20.1b
Ketose → Ketone. Look for the one with the ketone.

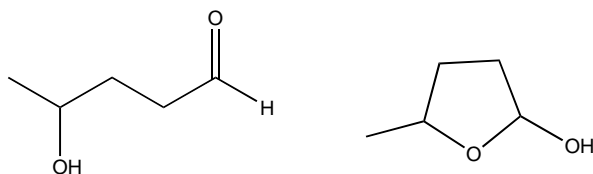
12. (5 points) Circle all of the stereocenters below (or write “none,” if appropriate).



Only the middle carbon of the first sugar. Chptr 20 p 494

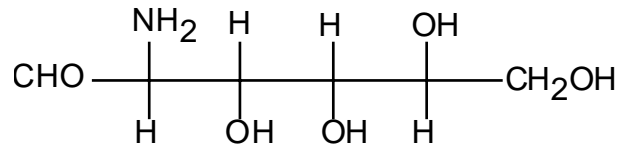
Note that the symmetry of the 2nd molecule makes its middle carbon achiral.

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

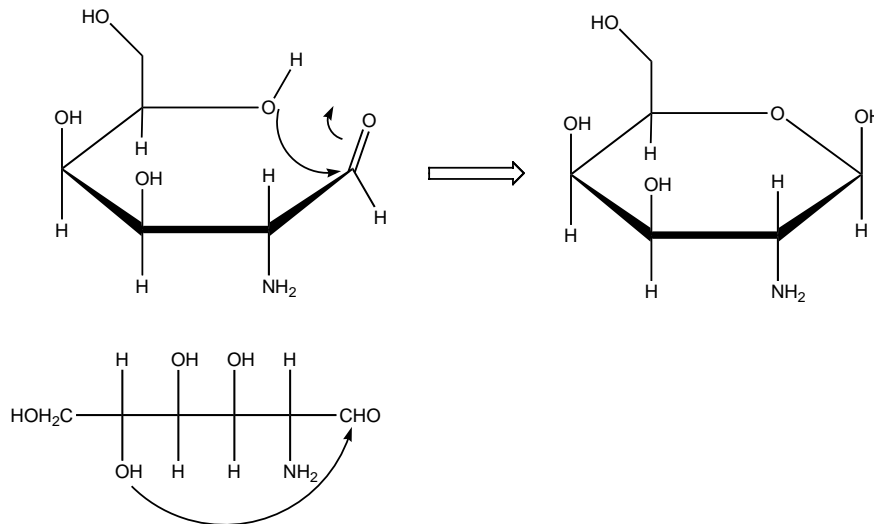


The cyclic hemiacetal is more stable OWL 20.2c

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.



D-Galactosamine Chptr 20 p 499

I put D-glucose in both its linear and cyclized forms on the front page to help both with this question and with the next. I was hoping that you could use that as an analogy to help in answering this question.

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

1) D-sugar 2) L-sugar

Chptr 20

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

1) 250

2) 101

3) 496

4) 728

(1)