

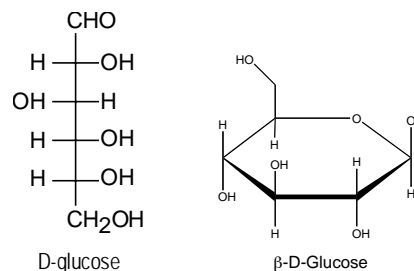
Chem 250

Answer Key Extra Credit Quiz (Exam 2) v1

This exam is composed of **20** 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.

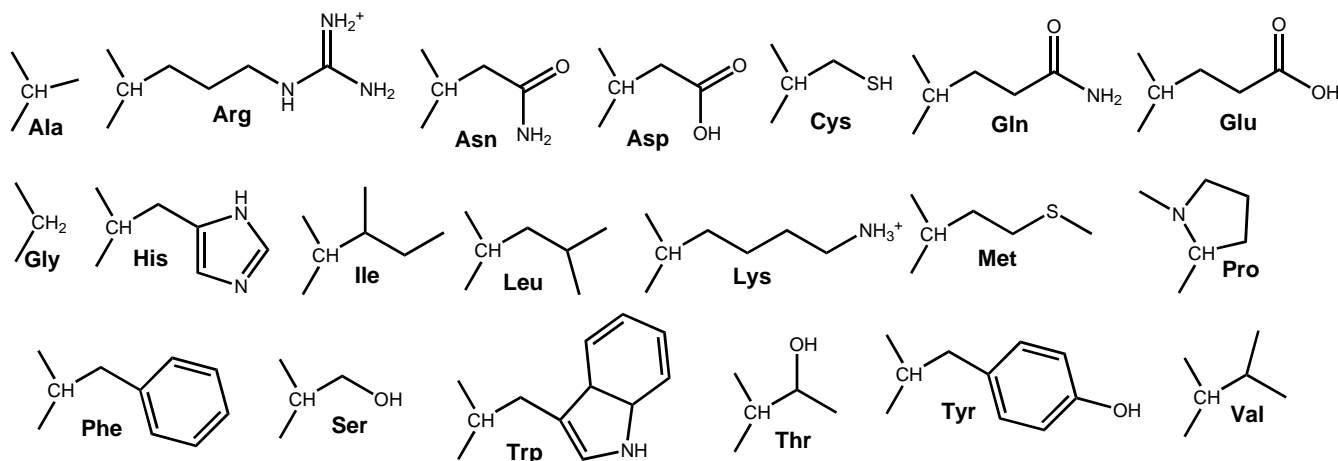
I hereby state that all answers on this exam are my own and that I have neither gained unfairly from others nor have I assisted others in obtaining an unfair advantage on this exam.



Signature

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)									



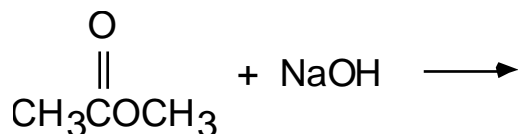
1. (5 points) Which listing below correctly orders the boiling points of the indicated molecules?

- 1) propanoic acid > 1-butanol > diethyl ether
- 2) propanoic acid > diethyl ether > 1-butanol
- 3) 1-butanol > propanoic acid > diethyl ether
- 4) diethyl ether > propanoic acid > 1-butanol
- 5) 1-butanol > diethyl ether > propanoic acid

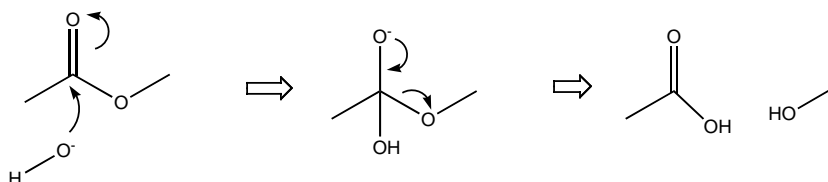
think about what H-bonding opportunities are available for each. How can that molecule interact with another of itself?

(1) acid > alcohol > ether (all have about the same MW) (Chptr 18)

2. (5 points) The products of the following reaction are:



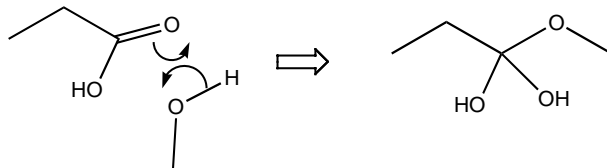
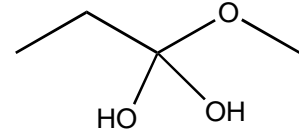
- 1) sodium propanoate and water
- 2) sodium acetate and formaldehyde
- 3) methanol and sodium acetate
- 4) methanol and sodium formate
- 5) none of the above



(3) hydrolysis of an ester Chapter 19, p 480 / Quiz 2

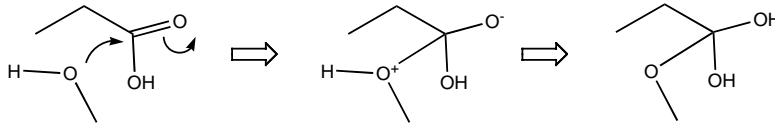
3. (5 points) Which two reactants would lead to the Fischer esterification reaction intermediate shown at right?

- 1) butanoic acid and methanol
- 2) butanal and formic acid
- 3) 1-butanone and formic acid
- 4) propanoic acid and methanol
- 5) none of the above

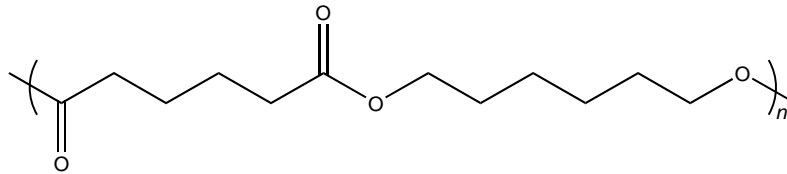


(4) OWL 18.5e / Quiz 2

You might have remembered that Fischer esterifications involve an attack by an alcohol on a carboxylic acid, but if you didn't, the other reactions won't lead to intermediates of this sort. An alternative view of the above is:



4. (5 points) The molecule below is an example of what kind of polymer?



- 1) polyester
- 2) polycarbonate
- 3) polyamide
- 4) polyacrylate

(1) (Chptr 19) Ester linkage:  **poly-ester**

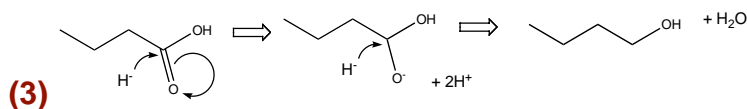
5. (5 points) The reactions of gluconeogenesis are simply the reactions of glycolysis run in reverse

- 1) True
- 2) False

(2) False (OWL 29.2) Perhaps the primary "key concept" we talked about in this section!

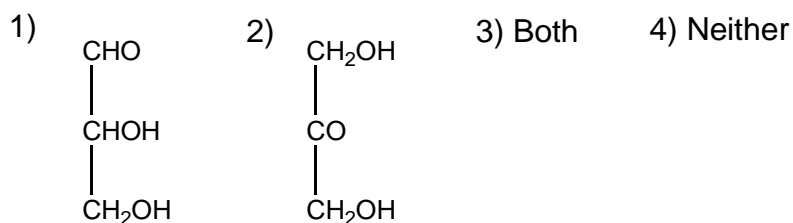
6. (5 points) The reaction of butanoic acid and LiAlH_4 in water yields:
- 1) CO_2 and propanal
 - 2) CO_2 and propanoic acid
 - 3) water and butanol
 - 4) water and butanal
 - 5) nothing. No reaction occurs.

Remember that LiAlH_4 is a reductant or H^- donor. The only thing that can be readily reduced is the $\text{C}=\text{O}$ double bond. You can simply add to H^- across the double bond, or you can think about attack by H^-



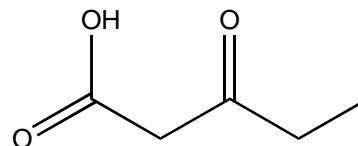
OWL 18.5d / Quiz 2

7. (5 points) Which of the following is/are Ketose(s)?



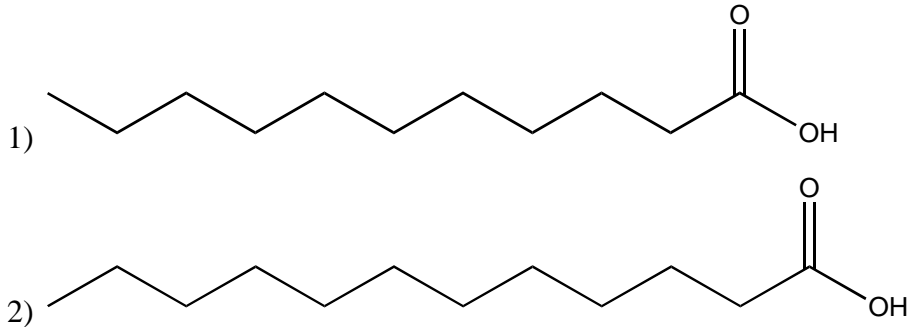
(2) The second one is. see p 494 and OWL 20.1b
Aldehyde → Ketose. Look for the one with the ketone (Quiz 2)

8. (5 points) Heating the molecule at right yields which products?
- 1) propanoic acid and carbon dioxide
 - 2) acetic acid and propanoic acid
 - 3) butanoic anhydride
 - 4) 2-butanone and carbon dioxide
 - 5) no reaction occurs



(4) decarboxylation of β -ketocarboxylic acid (Chptr 18). There is a nice presentation of this on p. 468 of the text, using almost exactly this molecule.

13. (5 points) Which fatty acid below is not of natural origin?



3) Neither are of natural origin

4) Both are of natural origin

(1) – 11 carbons – even number (Chptr21) – key concept.

Do you remember why?

14. (5 points) ATP is often hydrolyzed in order to drive unfavorable reactions. Another important and very common role for ATP that does not involve hydrolysis is:

1) reduction of carboxylic acids

2) phosphorylation of alcohols

3) oxidation of alcohols

4) oxidation of primary amines

5) cyclization of sugars

(2) Chptr 28 – Remember we talked about two key roles for ATP?

15. (5 points) What force is most dominant in driving a protein from an ensemble unfolded of states to a compact globular structure?

1) hydrogen bonding

2) hydrophobic collapse

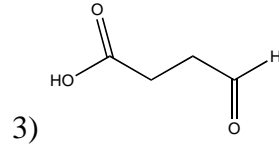
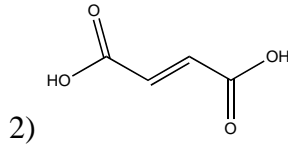
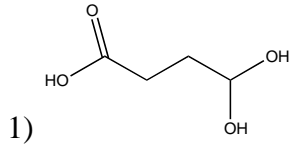
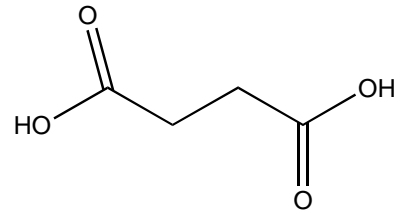
3) disulfide bonding

4) formation of helices

5) electrostatic attraction between charged amino acid side chains

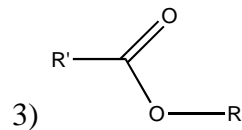
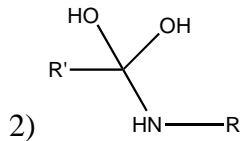
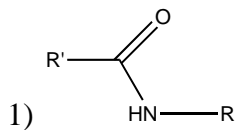
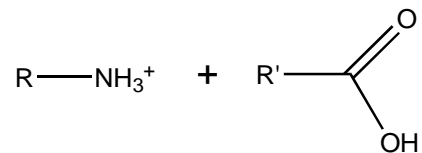
(2) Chptr 22 – This is a key concept in protein folding. Oil/water et al.

16. (5 points) In the Citric Acid cycle, which is a product of the reaction of succinate (shown at right) with FAD?
(You are *not* expected to know this from memory)



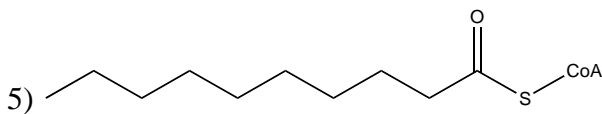
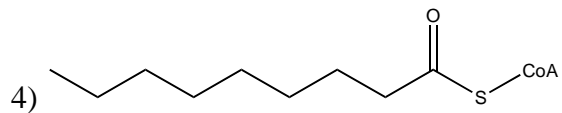
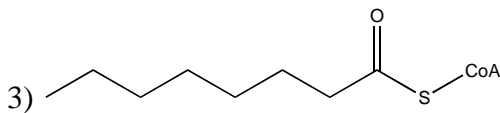
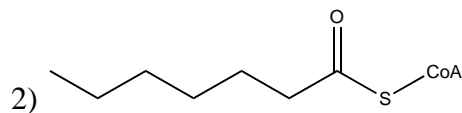
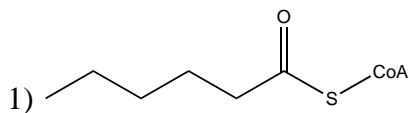
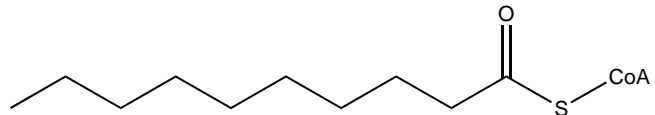
(2) (Chptr 27)

17. (5 points) Which is a stable product of the following reaction?



(1) (Chptr 22 & 19)

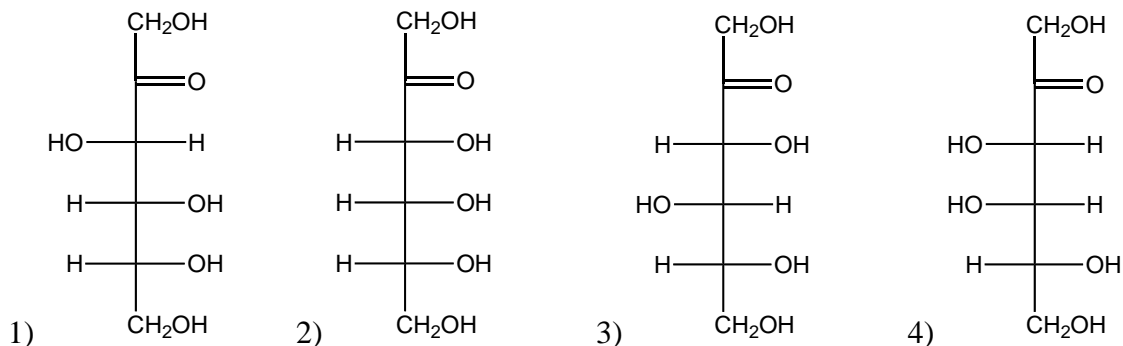
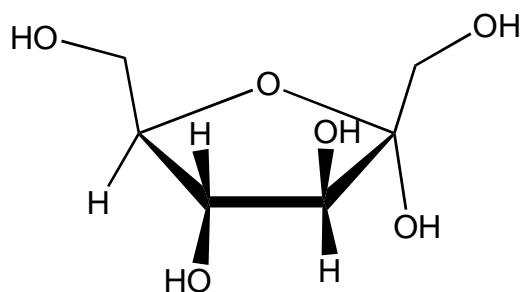
18. (5 points) For the fatty acid at right, which is the structure of the product resulting from one complete round of β -oxidation?



(3) (2 carbons shorter) (Chptr 28)

19. (5 points) Which is the Fischer projection corresponding to the linear form of the molecule shown at right.

Chapter 20



(1)

20. (5 points) What is the course number of this class?

1) 250

2) 111

3) 496

4) 728

(1)