

1. (2 points) What is the chemical formula for the molecule at right?

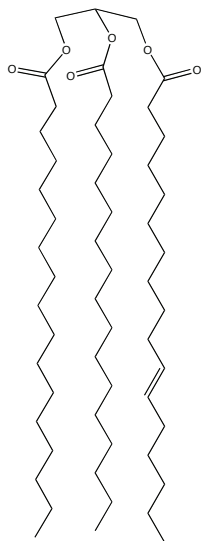
- 1) C_6H_{10} 2) C_6H_{12} 3) C_6H_{14} 4) C_6H_{16} 5) C_6H_{18}

2. (2 points) What is the functional group in CH_3COCH_3 ?

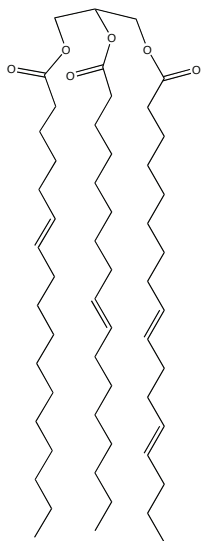
- 1) aldehyde 2) ether 3) alcohol 4) carboxylic acid 5) ketone

3. (2 points) Triglycerides are a common form a fat in our bodies. Which of the following triglycerides is *most* likely to be a liquid at room temperature?

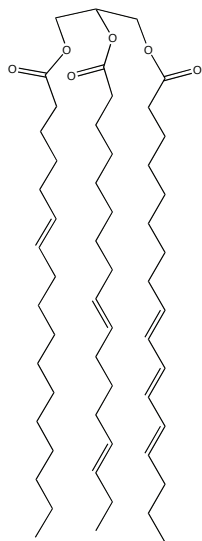
1)



2)

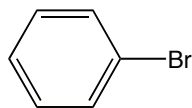


3)

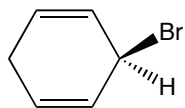


4. (2 points) Which molecule below has a chiral center?

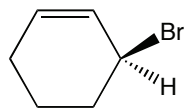
1)



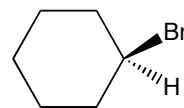
2)



3)



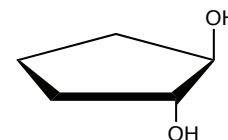
4)



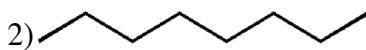
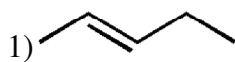
- 5) 2, 3, and 4 all have chiral centers

5. (2 points) The molecule at right is

- 1) a cis isomer 2) a trans isomer 3) not an isomer

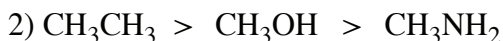
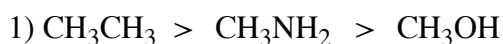


6. (2 points) Which molecule below is less reactive, in general?



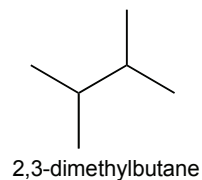
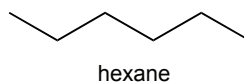
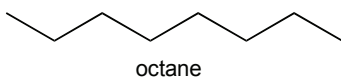
3) they have the same reactivity

7. (2 points) Rank boiling points, highest to lowest:



5) They are all about the same

8. (2 points) Which molecule below has the highest boiling point?



1) octane

2) hexane

3) 2,3-dimethylbutane

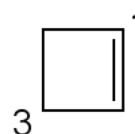
9. (2 points) In the molecule at right, the ideal bond angle around the 1-carbon is:

1) 120°

2) 109°

3) 90°

4) 180°

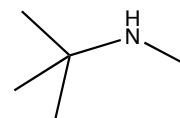


10. (2 points) In the molecule at right, the amine is classified as:

1) primary

2) secondary

3) tertiary

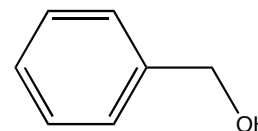


11. (2 points) In the molecule at right, the alcohol is classified as:

1) primary

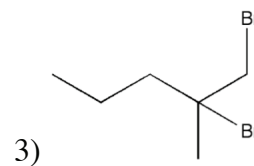
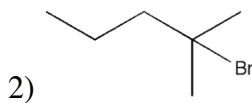
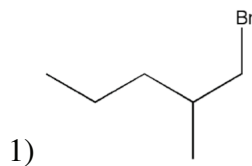
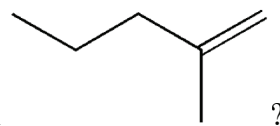
2) secondary

3) tertiary



12. (2 points) Ketones are readily oxidized (by oxygen in air) to
 1) aldehydes 2) alcohols 3) carboxylic acids 4) the parent alkanes
 5) ketones are not readily oxidized
13. (2 points) Aldehydes are readily oxidized (by oxygen in air) to
 1) ketones 2) alcohols 3) carboxylic acids 4) the parent alkanes
 5) aldehydes are not readily oxidized
14. (2 points) Aldehydes are reduced by H_2 and an appropriate catalyst to
 1) ketones 2) alcohols 3) carboxylic acids 4) the parent alkanes
 5) aldehydes are not readily reduced
15. (2 points) Ketones are reduced by H_2 and an appropriate catalyst to
 1) aldehydes 2) alcohols 3) carboxylic acids 4) the parent alkanes
 5) ketones are not readily reduced

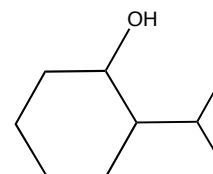
16. (2 points) What is the product of the reaction of HBr with



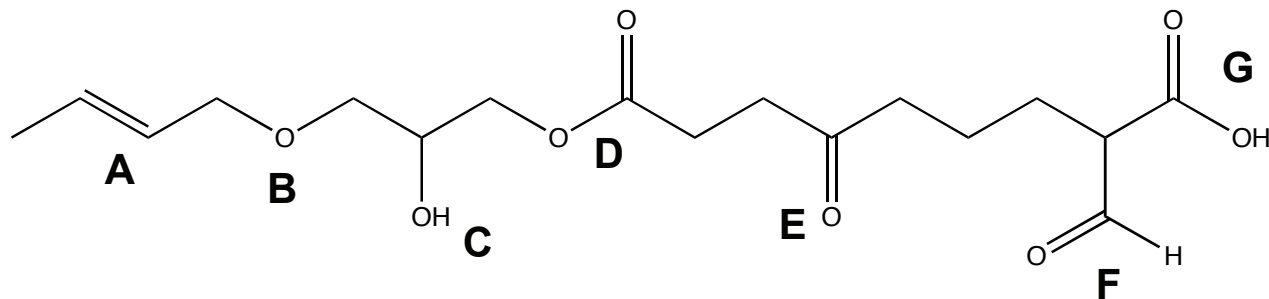
17. (2 points) A racemic mixture
 1) rotates polarized light to the right 2) rotates polarized light to the left
 3) does not rotate polarized light

18. How many chiral centers are in the molecule at right?

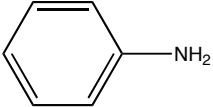
- 1) 0 2) 1 3) 2 4) 3 5) 10

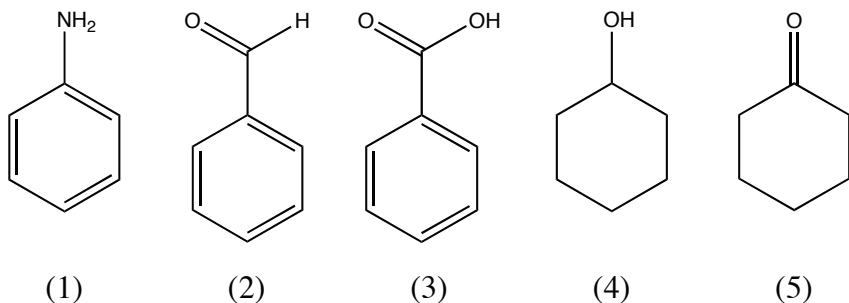


For questions 19 to 23, refer to the molecule below.

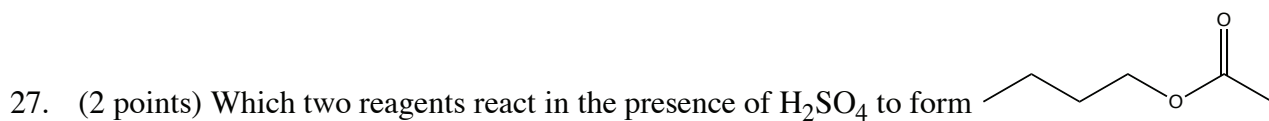


19. (2 points) Which of the above represents an aldehyde group?
 1) B 2) D 3) E 4) F 5) G
20. (2 points) Which of the above represents a ketone group?
 1) B 2) D 3) E 4) F 5) G
21. (2 points) Which of the above represents an ether group?
 1) B 2) D 3) E 4) F 5) G
22. (2 points) Which group above is acidic?
 1) B 2) D 3) E 4) F 5) G
23. (2 points) The functionality at A is:
 1) cis 2) trans 3) neither

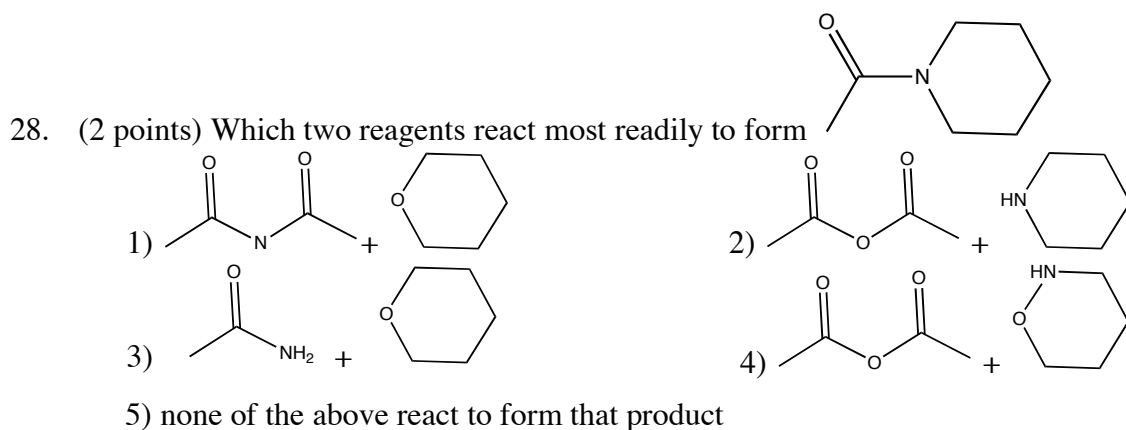
24. The molecule at right is: 
- 1) toluene 2) aniline 3) benzoic acid 4) benzaldehyde 5) cyclohexamine



25. (2 points) Which molecule above in a reaction with $K_2Cr_2O_7$ and H_2SO_4 yields cyclohexanone?
26. (2 points) Which molecule above in a reaction with H_2 and a transition metal catalyst yields cyclohexanol?



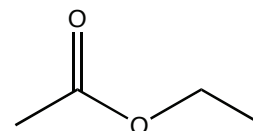
- 1) ethanoic acid and butanol
- 2) butanoic acid and ethene
- 3) butanol and methane
- 4) butanoic acid and ethanol
- 5) none of the above



29. (2 points) Which listing portrays the carbons in increasing oxidation state

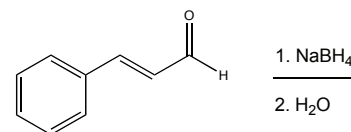
- 1) $\text{R}-\text{CH}_3$ $\text{R}-\text{C}_{\text{H}_2}-\text{OH}$ $\text{R}-\text{C}_{\text{H}}-\text{O}$ $\text{R}-\text{C}_{\text{OH}}-\text{O}$
- 2) $\text{R}-\text{CH}_3$ $\text{R}-\text{C}_{\text{H}}-\text{O}$ $\text{R}-\text{C}_{\text{H}_2}-\text{OH}$ $\text{R}-\text{C}_{\text{OH}}-\text{O}$
- 3) $\text{R}-\text{C}_{\text{OH}}-\text{O}$ $\text{R}-\text{C}_{\text{H}_2}-\text{OH}$ $\text{R}-\text{C}_{\text{H}}-\text{O}$ $\text{R}-\text{CH}_3$
- 4) $\text{R}-\text{C}_{\text{OH}}-\text{O}$ $\text{R}-\text{C}_{\text{H}}-\text{O}$ $\text{R}-\text{C}_{\text{H}_2}-\text{OH}$ $\text{R}-\text{CH}_3$

30. (2 points) Hydrolysis of the compound at right would yield



- 1) Propanoic acid and methanol 2) Propanol and methanoic(formic) acid
 3) Ethanoic (acetic) acid and methanol 4) Ethanol and ethanoic (acetic) acid
 5) This compound does not undergo hydrolysis

31. (2 points) The products of the reaction of cinnamaldehyde with NaBH_4 (see scheme at right) are:



- 1) a carboxylic acid 2) an alcohol
 3) sodium boroster 4) a diol
 5) no reaction will occur

32. (2 points) Which do you think is more acidic: benzoic acid or acetic acid?

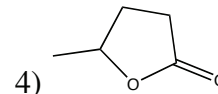
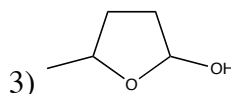
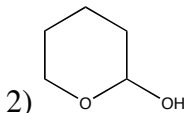
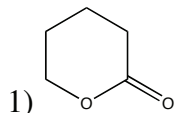
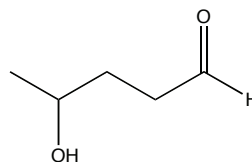
- 1) benzoic acid 2) acetic acid

33. (2 points) Which do you think is more acidic: acetic acid or trichloroacetic acid?

1) acetic acid

2) trichloroacetic acid

34. (2 points) The molecule at right can cyclize to form:



35. (2 points) Roger Clemens needs your help. Someone has given him only one of the possible stereoisomers of androstenedione. What are the odds (assuming a random grabbing of bottles) that he has the correct stereoisomer?

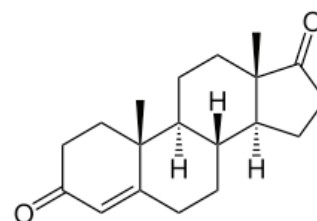
1) 1 in 8

2) 1 in 32

3) 1 in 64

4) 1 in 100

5) I don't know, but he should retire



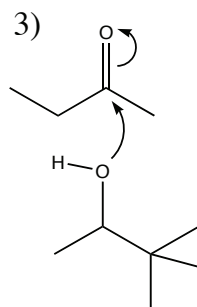
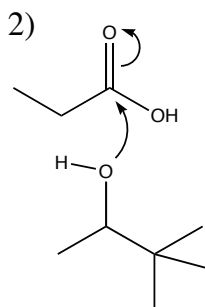
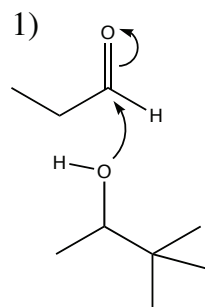
36. (2 points) Androstenedione (see above) is expected to have what kind of geometry?

1) absolutely flat

2) almost flat

3) very distorted

37. (2 points) The following represent initial steps in a reaction. Which is most favorable?



38. (2 points) Which are you most likely to find as a flavoring added to your favorite candy?

1) a long, branched alkane

2) an aldehyde

3) a carboxylic acid

39. (2 points) Which is more polar?

1) an alcohol

2) a thiol

40. (2 points) What is the catalog number for this class?

1) 250

2) 111

3) 86

4) 3.14159

5) 68.6 g

Turn this page in, along with your OpScan Sheet (be sure your name is on both!)

41. (5 points) Draw the structure for dimethylethylamine:
42. (5 points) Draw the structure for 1-chloro-3-pentenol:
43. (5 points) Draw the structure for apple flavor: methyl butanoate
44. (5 points) Draw the structure for 2-ketodipentanoic acid

Turn this page in, along with your OpScan Sheet (be sure your name is on both!)