

This practice test is meant to suggest the types of questions and content to be covered. It is not meant to be all inclusive of either. Please let me know of any errors that you find.

### MULTIPLE CHOICE.

1. Which of the following is an aromatic compound?

- a)  $\text{CH}_2=\text{CH}_2$       b)       c)       d)  $\text{CH}_3\text{OH}$

2. When predicting reactions

- a) alkenes undergo addition while aromatics undergo substitution  
 b) both alkenes and aromatics undergo addition  
 c) alkenes undergo substitution while aromatics undergo addition  
 d) both alkenes and aromatics undergo substitution

3. Polycyclic aromatic hydrocarbons (PAHs) are suspected

- a) antibiotics      b) carcinogens      c) contraceptives      d) lacrimators

4. Rubbing alcohol is

- a) ethyl alcohol      b) isobutyl alcohol      c) isopropyl alcohol      d) methyl alcohol

5. Which of the following has the worst smell?

- a) benzene      b) butane      c) 2-butanethiol      d) dimethyl ether

6. Which compound below has a chiral carbon?

- a)  $\text{CH}_3\text{CHBrCH}_2\text{CH}_3$       b)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$       c)  $\text{CH}_3\text{CH}_2\text{-O-CH}_3$       d)  $\text{CH}_3\text{CH=CH}_2$

7. Tollen's test, when yielding a positive reaction for aldehydes yields a

- a) blue solution      b) red solution      c) silver mirror      d) green to yellow to orange to brick red

8. Acetone is commonly used

- a) as an antiseptic      b) as finger nail polish remover      c) to oxidize alcohols      d) to detect natural gas leaks

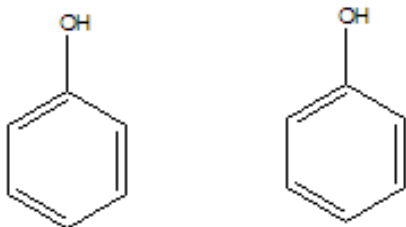
9. *Nonsuperimposable* mirror images are called

- a) anomers      b) diastereomers      c) enantiomers      d) epimers

10. Which of the following objects is *chiral*?

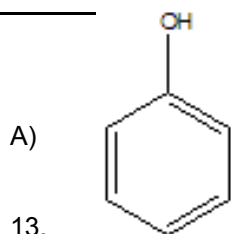
- a) button-down sweater      b) hammer      c) knife      d) baseball bat

11. Show by use of a DASHED line (----) how the following pair of molecules can hydrogen bond. Show this only once for each pair. If no hydrogen bonding can occur, write NO H-BOND

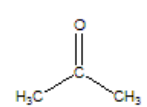


Circle the compound below out of **each pair** that has the **higher** boiling point.

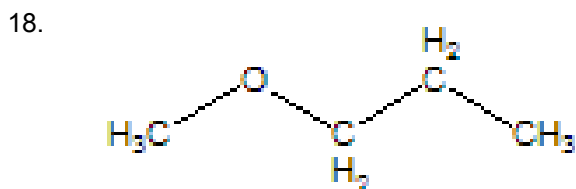
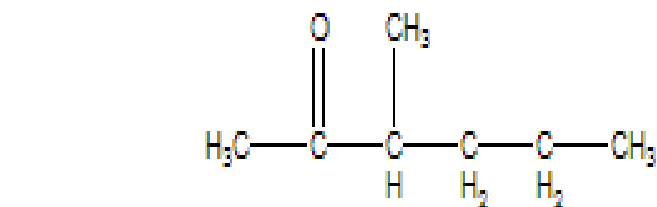
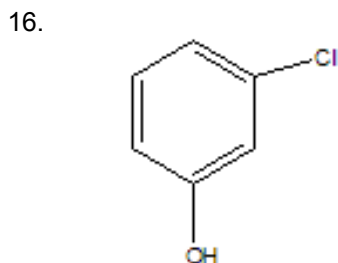
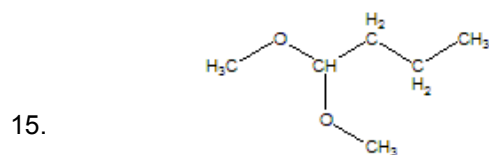
12. A)  $\text{CH}_3\text{CH}_2\text{OCH}_3$  or B)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$



13. or B) 

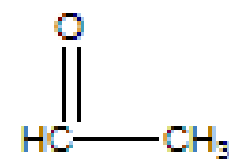
14. A)  $\text{CH}_3\text{CH}_2\text{OH}$  or B) 

Give correct IUPAC or common names for the compounds below. Use cis- or trans- as appropriate.



OXIDATION-REDUCTION. For each of the pairs of compounds below, circle the structure that is the **REDUCED** species of that pair.

19. A)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$  or B) 

20. A)  or B)  $\text{CH}_3\text{CH}_2\text{OH}$

For the molecule 1-propanol draw the **major** organic product if it undergoes the following reactions

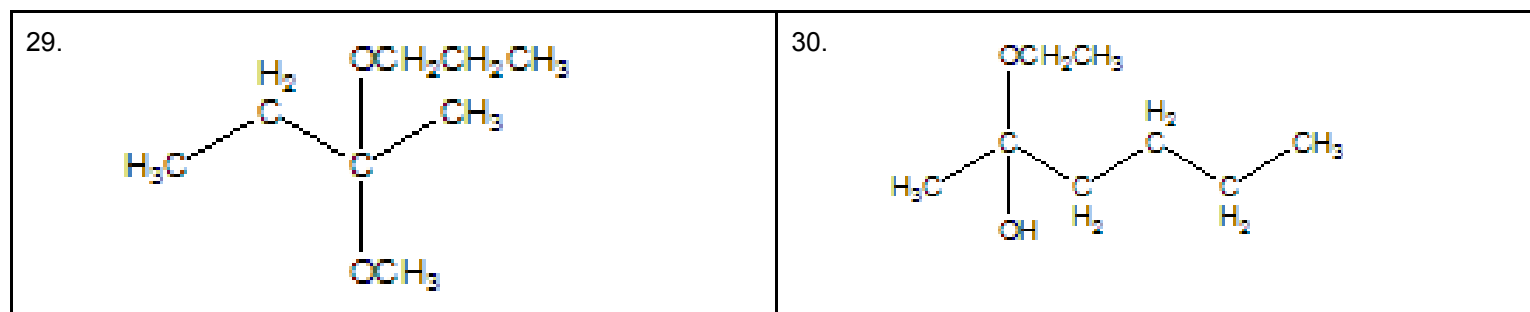
21. Elimination/dehydration to make an alkene
22. Dehydration/condensation to make an ether
23. Oxidation
24. Condensation reaction with ethanal.to make a hemiacetal
25. Condensation reaction with ethanal.to make an acetal

Draw condensed structural formulas for each of the following:

26. m-chlorotoluene	27. 1,3-diphenylpropane
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28. Draw all possible Fischer projections for 2,3,4-trihydroxybutanal.

Identify the molecules below as A (acetal), HA (hemiacetal), or N (neither). Draw arrow to all chiral carbons



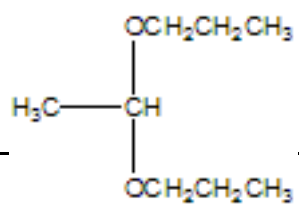
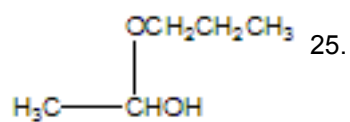
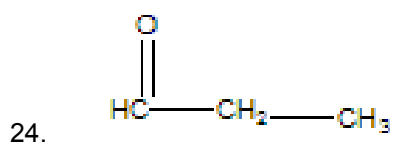
## ANSWER KEY

1. b) benzene
2. a) alkenes undergo addition while aromatics undergo substitution
3. b) carcinogens
4. c) isopropyl alcohol
5. c) 2-butanethiol
6. a)  $\text{CH}_3\text{CHBrCH}_3$
7. c) silver mirror
8. b) as finger nail polish remover
9. c) enantiomers
10. a) button-down sweater
11.  $\text{OH} \text{-----} \text{OH}$   

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Benzene Ring

|  
Benzene Ring
12. B) 1-propanol can H-bond
13. A) phenol can H-Bond
14. A) ethanol can H-bond
15. 1,1,-dimethoxybutane
16. m-chlorophenol or 3-chlorophenol
17. 3-methyl-2-hexanone or 3-methyl-2-oxohexane
18. methylpropyl ether or 1-methoxypropane
19. A) since it contains less C-O bonds
20. B) since it contains less C-O bonds
21.  $\text{CH}_3\text{CH}=\text{CH}_2$
22.  $\text{CH}_3\text{CH}_2\text{CH}_2\text{-O-CH}_2\text{CH}_2\text{CH}_3$

23.



26.

27.

28. See class notes .

29. A

30. B

