1. (15 points) Draw the structure for 3,4-dimethyl-2-pentanol

2. (15 points) Draw the structure for ortho-chlorotoluene
3. (5 points) What is the chemical formula for the molecule at right?

1) C₆H₈  2) C₆H₁₀  3) C₆H₁₂  4) C₆H₁₄  5) C₆H₁₆

4. (5 points) What is the product of the reaction of HBr with

\[ \text{?} \]

1)  
2)  
3)  

5. (5 points) What is the functional group in CH₃CHO?

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

6. (5 points) What is the functional group in CH₃COCH₃?

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

7. (5 points) The molecule at right is

1) a cis isomer  2) a trans isomer  3) not an isomer
8. (5 points) The molecule at right is
   1) a cis isomer  2) a trans isomer  3) not an isomer

9. (5 points) The molecule at right is
   1) a cis isomer  2) a trans isomer  3) not an isomer

10. (5 points) In the molecule at right the chlorine is in what position?
    1) axial  2) equatorial  3) cis  4) trans

11. (5 points) Which molecule below is more reactive, in general?
    1)  
    2)  
    3) they have the same reactivity

12. (5 points) In the molecule at right, the ideal bond angle around the 3-carbon is:
    1) 120°  2) 109°  3) 90°  4) 180°

13. (5 points) Which molecule below has the highest boiling point?
    1) octane  2) hexane  3) 2,3-dimethylbutane
14. (5 points) Which molecule below has the lower boiling point?

1)  2)  3) they have about the same boiling point

15. (5 points) In the molecule at right, the alcohol is classified as:

1) primary 2) secondary 3) tertiary

16. (5 points) Which is the stronger acid?

1) cyclohexanol  
2) phenol  
3) they are the same

17. (5 bonus points) What is the catalog number for this class?

1) 111  2) 250  3) 86  4) 3.14159  5) 68.6 g