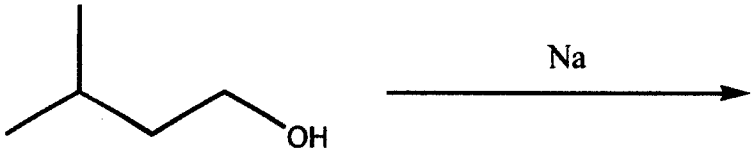
ORGANIC CHEMISTRY II CHE 242 **UNIT FIVE PRACTICE**

1) In a 1-butanol molecule, what part of the molecule is described as hydrophobic?

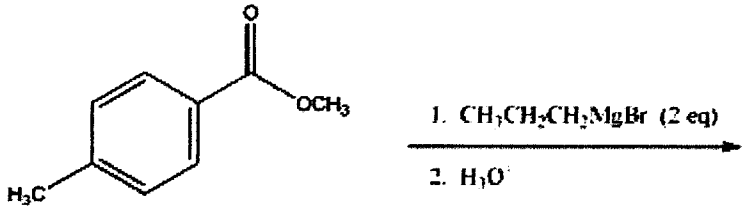
2) Arrange the following alcohols in order of increasing boiling point:

$(CH_3)_3COH$, $CH_3(CH_2)_4OH$, $(CH_3)_3CCH_2OH$, and $(CH_3)_2CHCH_2CH_2OH$.

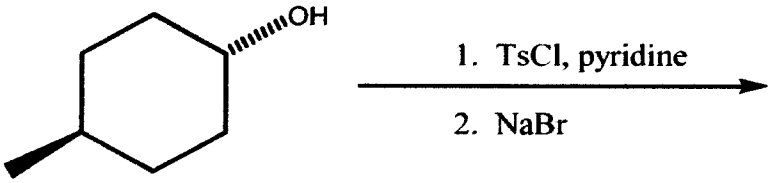
3) Provide the major organic product of the following reaction.



4) Provide the major organic product of the reaction below.

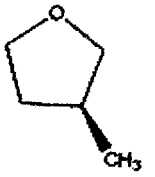


5) Provide the major organic product of the following reaction.



6) Provide the major organic product of the reaction shown.

7) How many peaks appear in the proton spin decoupled ^{13}C NMR spectrum of the compound below?



A) 1 B) 2 C) 3 D) 4 E) 5

8) Which of the following is not a property of ethers which makes them good solvents in organic reactions?

A) They have relatively high boiling points for their molecular weights.
B) They dissolve a wide range of nonpolar substances.
C) They dissolve a wide range of polar substances.
D) They are normally unreactive toward strong bases.
E) They are nonhydroxylic.

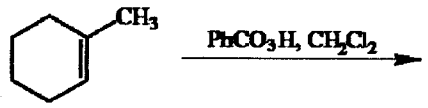
9) Deduce the identity of the following compound from the spectral data given.

$C_4H_8O_2$: ^1H NMR, δ 1.23 (3H, triplet), 2.00 (3H, singlet), 4.02 (2H, quartet) (ppm); IR, 2980, 1740 cm^{-1}

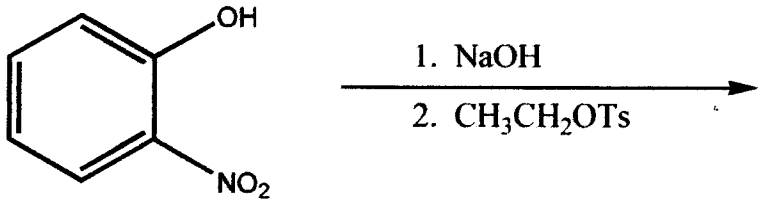
10) Provide the major organic product in the reaction below.

$$CH_3CH_2CH_2OH \xrightarrow[2.\ PhCH_2Br]{1.\ Na} \rightarrow$$

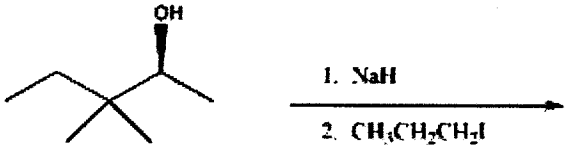
11) Provide the major organic product in the reaction below.



12) Provide the major organic product of the following reactions.



13) Provide the major organic product of the reaction shown below.



14) Which of the following reagents is the best choice for oxidizing a primary alcohol to an aldehyde?

A) $Na_2Cr_2O_7$, H_2SO_4
B) $KMnO_4$
C) pyridinium chlorochromate
D) H_2CrO_4
E) $LiAlH_4$

15) Provide the structure of the major organic product in the reaction below.

$$(CH_3)_2CHCH_2CH_2CHO \xrightarrow[2.\ H_3O^+]{1.\ LiAlH_4}$$

16) Provide a structure that is consistent with the data below.

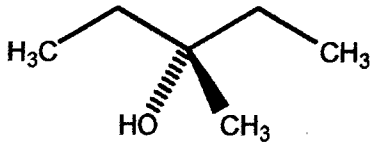
$C_7H_{14}O_2$

IR (cm^{-1}): 2950, 1740

^1H NMR (d): 2.3 (2H, q), 1.0 (3H, t), 0.9 (9H, s)

^{13}C NMR (d): 185 (s), 78 (s), 29 (t), 14 (q), 12 (q)

17) Predict the number of signals expected (disregarding splitting) in the ^1H NMR spectrum of the compound shown below.



18) Predict the number of signals expected, their splitting, and their relative area in the ^1H NMR spectrum of 1,2-dichloroethane ($ClCH_2CH_2Cl$).

19) Predict the number of signals expected (disregarding splitting) in the ^1H spectrum of 1,1-dimethylcyclobutane.