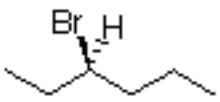
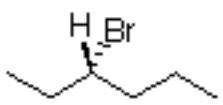
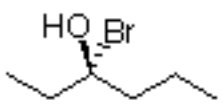
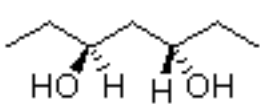
Stereochemistry Problem Set

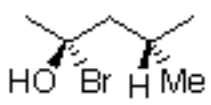
1) Indicate whether the following structures are chiral or achiral (no asymmetric centers or meso); if chiral then assign R or S to each stereogenic center.

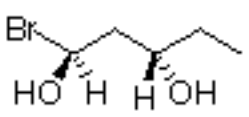
a) 

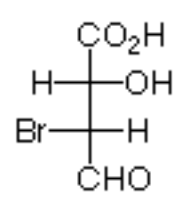
b) 

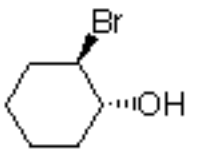
c) 

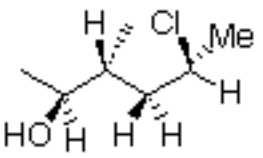
d) 

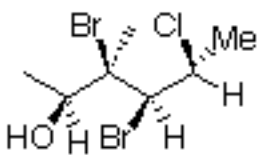
e) 

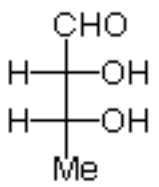
f) 

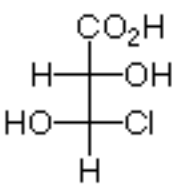
g) 

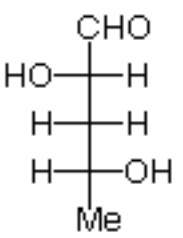
h) 

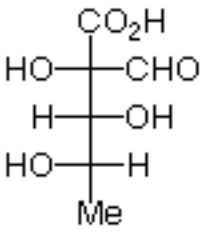
i) 

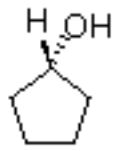
j) 

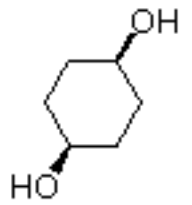
k) 

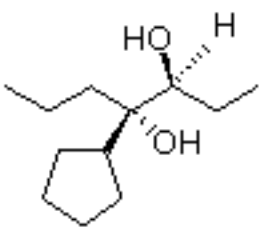
l) 

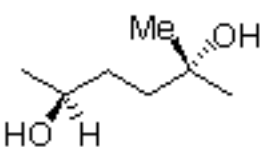
m) 

n) 

o) 

p) 

q) 

r) 

2) Draw structures which correspond to the following names:

a) (*R*) 2-bromobutane

b) (*S*) 2-iodopentane

c) (2*R*, 3*S*) 2-bromo-3-iodoheptane

d) (*S*) 3-methylhexane

e) (3*S*, 5*S*) 3-hydroxy-5-methyloctane
(hydroxy = OH)

f) *meso*-1,2-dihydroxycydohexane

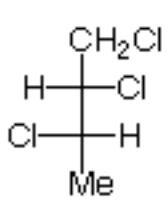
g) (*R*) 3-bromononane

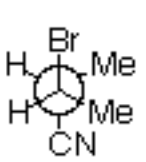
h) (*S*) 4-ethyldecane

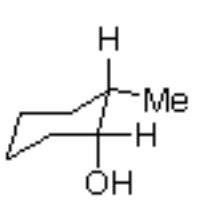
i) *meso*- 1,3-dimethylcydohexane

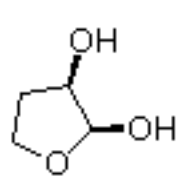
j) (*S*) 2-nitropentane (nitro = NO_2)

3) Draw i) an enantiomer; ii) a diastereomer, for each of the following

a) 

b) 

c) 

d) 

4) You have a sample of the enantiomerically pure (3*S*)-3-chloro-1-butene and carry out the non-stereospecific addition reaction shown below.

a) What happens to the absolute configuration of the existing stereocenter?
b) Draw Fisher projection(s) of the product(s).
c) How many product spots would you expect to see by TLC?
d) Which of the compounds corresponding to the TLC spots would be optically active?