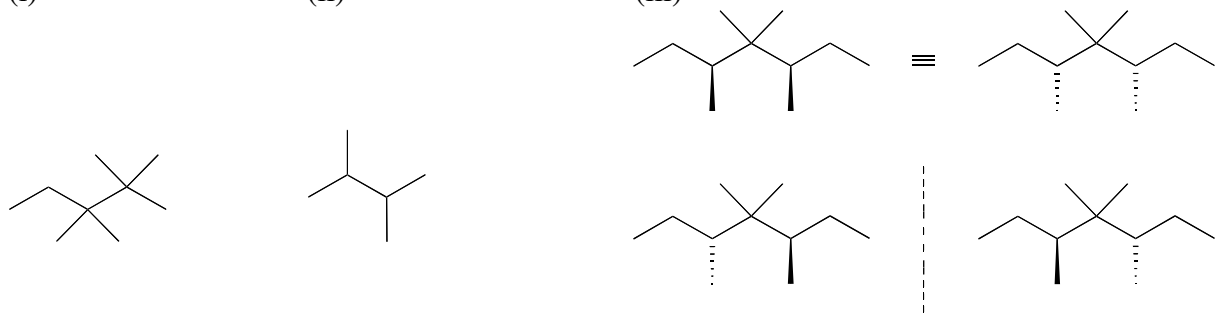
Chem1 Problem Set #1 (Lectures 1 - 12) - Solutions

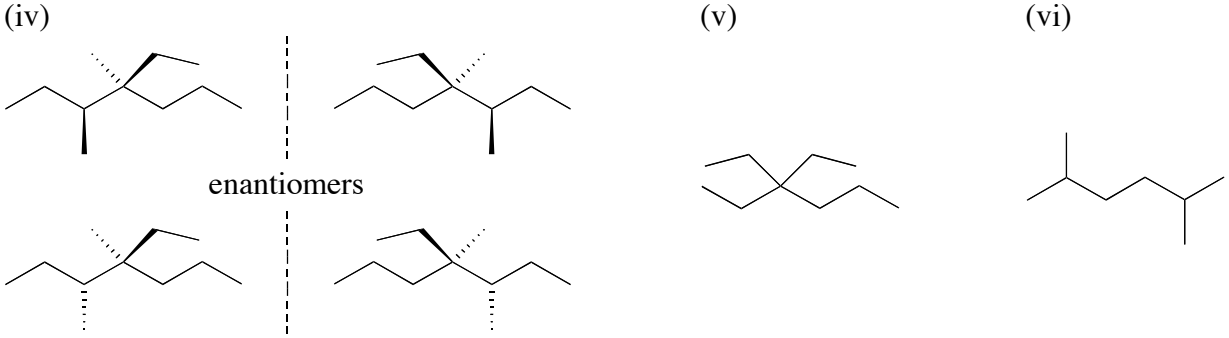
Question 1:

(i) (ii) (iii)



enantiomers

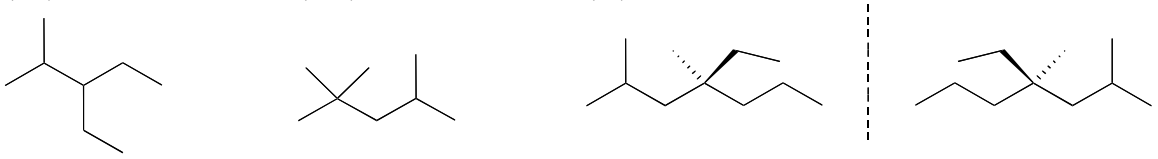
(iv) (v) (vi)



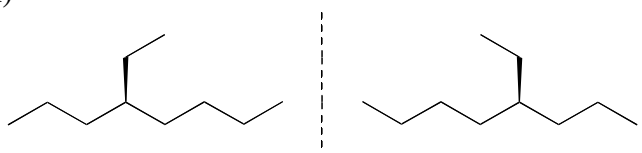
enantiomers

enantiomers

(vii) (viii) (ix)

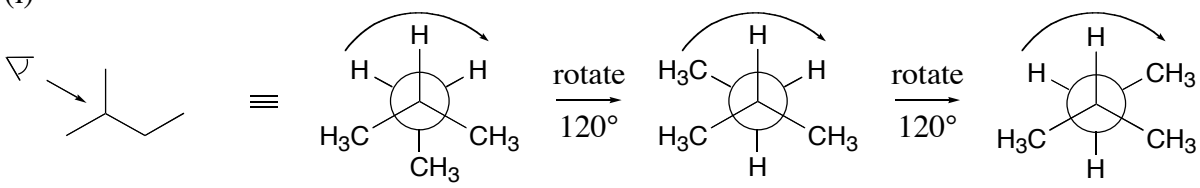


(x)

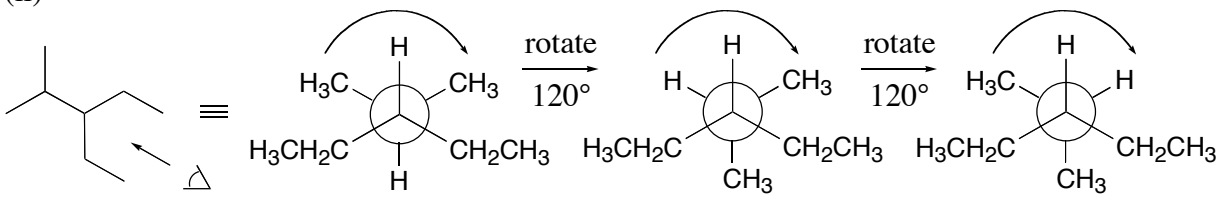


Question 2:

(i)

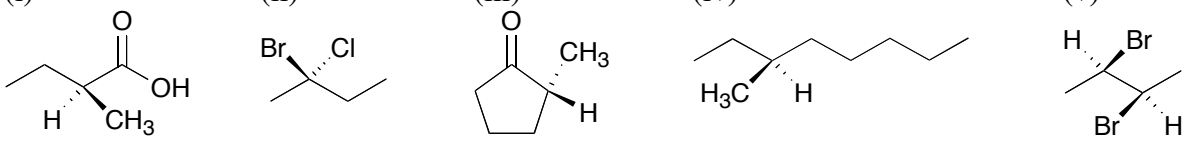


(ii)



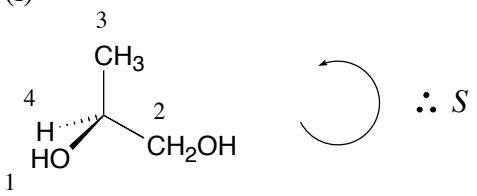
Question 3:

(i) (ii) (iii) (iv) (v)

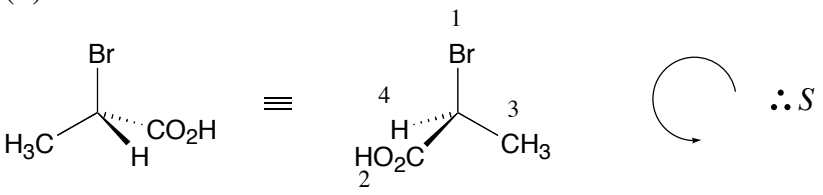


Question 4:

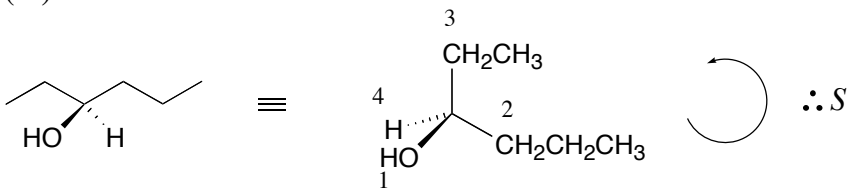
(i)



(ii)



(iii)



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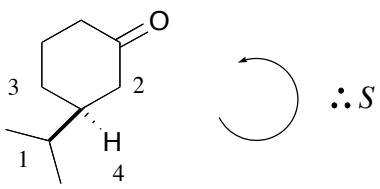

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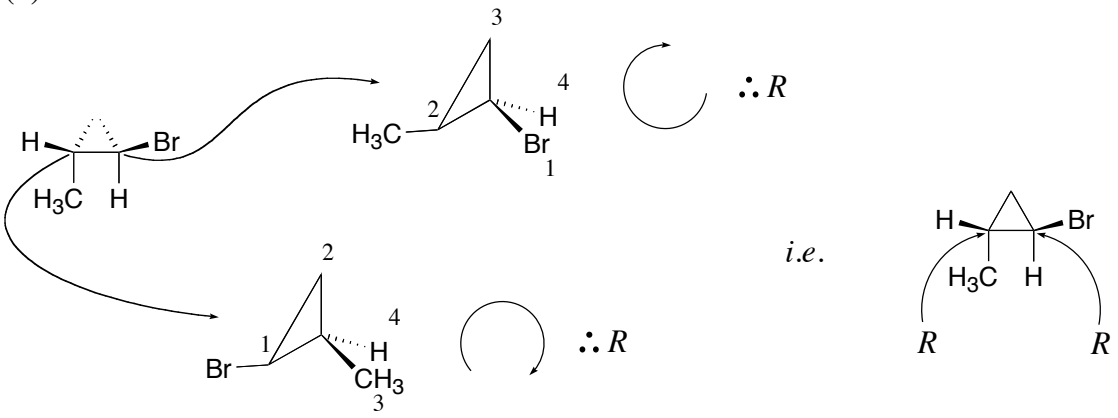

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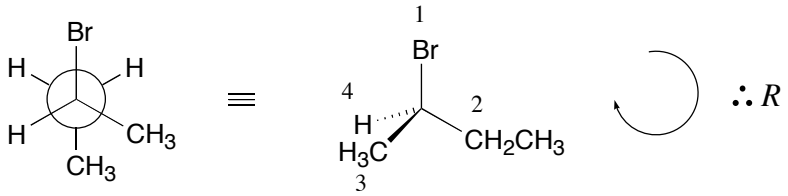
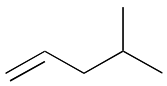


Question 5:

(i) a (ii) a (iii) c (iv) b (v) b (vi) c (vii) a

Question 6:

(i)



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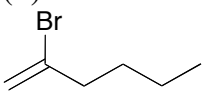
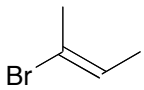


(iii)

(iv)



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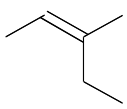

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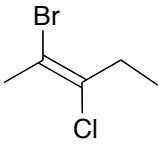

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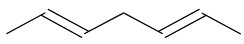
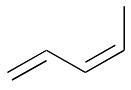
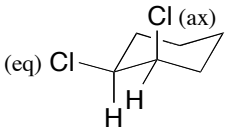


(viii)

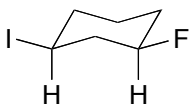


Question 7:

(i)

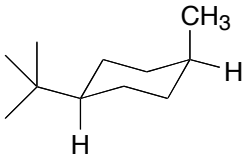


(ii)

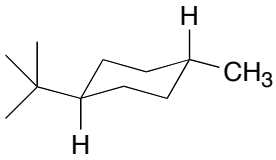


both I and F *eq*.

(iii)



(iv)



*t*Bu group *eq*. in both, it acts as a *steric lock* since the bulk of the *t*Bu group can only be accommodated in the *eq*. orientation. The CH_3 group is *ax*. in (iii), *eq*. in (iv)

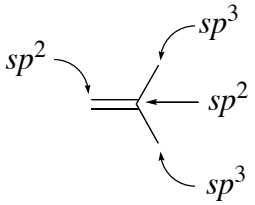
(*ax*. = axial eq. = equatorial)

Question 8:

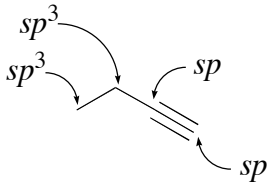
(i)

all sp^3

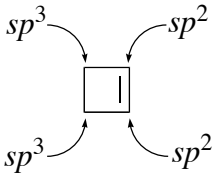
(ii)



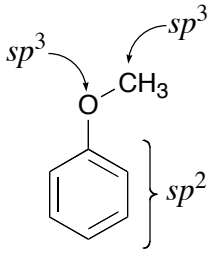
(iii)



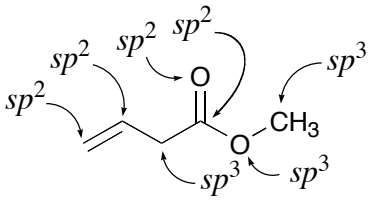
(iv)



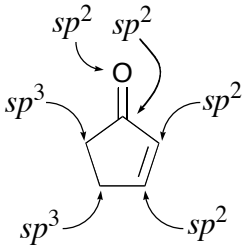
(v)



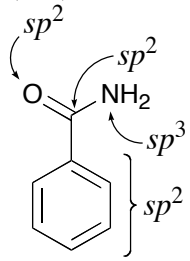
(vi)



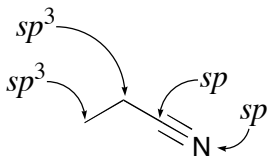
(vii)



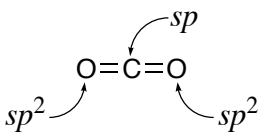
(viii)



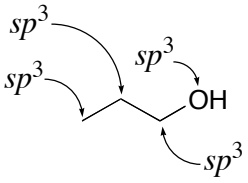
(ix)



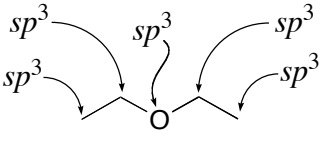
(x)



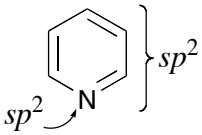
(xi)



(xii)



(xiii)



Question 9:

(i) (*R*)-3-chloro-3-methylhexane

(ii) 1-bromo-2-methyl-2-propanol

(iii) (*E*)-1-chloropropene

(iv) (*Z*)-3-bromo-2-hexene

(v) 1-bromo-1-methylcyclopentane

(vi) 3-chlorocyclohexene

(vii) ethyl butanoate

(viii) *m*-chlorobenzoic acid

(ix) *p*-bromonitrobenzene

(x) 5-bromo-2-nitrophenol