[1] Provide structures for the following. Assign the R or S configuration to the appropriate stereogenic centers.
   (a) A pair of enantiomers of the formula $C_3H_6O$.
   (b) A meso compound of the formula $C_4H_6Br_2$.
   (c) A pair of diastereomers of the formula $C_4H_9OCl$.

[2] (a) Identify the stereogenic centers in the following molecule and label them as (R) or (S).

(b) Explain why mycomycin, a naturally occurring antibiotic, is optically active.

Mycomycin $[\alpha]_D^{\circ} -130^\circ$

(c) Identify the chiral compounds among the following.

[3] Examine the following molecules and answer the questions that follow.

(a) Which two structures constitute a pair of enantiomers?
(b) Which two structures constitute a pair of diastereomers?
(c) Which two structures are identical?
(d) Which structure represents a meso compound?
(e) Which two structures are interconverted by a ring flip?