Suggested Solutions to Self-Check Questions

1.

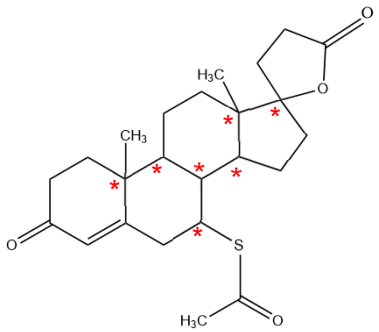
1. Molecular formula (MF) of X: $C_{12}H_{10}N_2O_2$, and MF of Z: C_6H_5NO. X and Z have the same empirical formula.
2. MF of Y is also $C_{12}H_{10}N_2O_2$, i.e. same as X, so it is a constitutional isomer of X.
3. MF of Y is double the MF of Z.

Answer: Options 1, 2 and 3 are correct

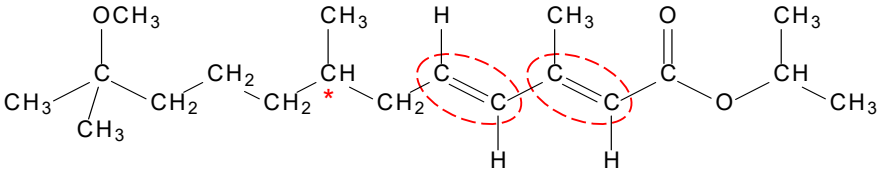
2. **(a)** 3-chloropent-1-ene **(b)** 5,6-dihydroxyheptan-3-one **(c)** 2-ethyl-1,1-dimethylcyclobutane

3. **D**

4. Spironolactone has a total of 7 chiral carbons.
Hence it forms a total of 2^7 stereoisomers.
(Ans: **D**)



5. Methoprene has one chiral carbon and two C=C bonds which have restricted rotation.



Thus it forms a total of $2^3 = 8$ stereoisomers.
(Ans: **C**)

Teacher's note: One of the 2 pairs of stereoisomers formed from restricted rotation about C=C bonds should be classified as E/Z isomers and not cis-trans isomers; you can expand the discussion to E/Z isomers if you wish to.