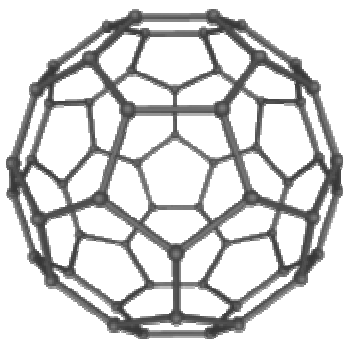1. Construct a multiplication table for C_{2h}

2. Illustrate in one or more drawings the symmetry operations of a cube. List the possible distortions of the cube which preserves one of its four - fold rotation axes.

3. In one or more diagrams, illustrate the symmetry elements of the molecule, C_{60}. Derive the point group.

4. Derive all possible products, A, A^2 etc.., if A stands for four fold rotation about an axis. Construct a multiplication table for the resulting set of symmetry operations. What additional symmetry operations are generated if you add a horizontal mirror plane to the above set of operations?

5. Considering that five-fold rotation and any rotation higher than six-fold do not occur in crystals, what are the possible crystallographic point groups? Which of these point groups are possible for a chiral crystal?

6. What is the point group of the following drawing?
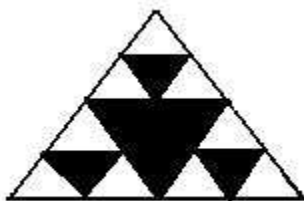
What other point groups will result if you use one colour (in addition to white) to paint only the white triangles? Can any more point groups be derived if you use two colours?