1. During this course we have learnt what it makes special to Nanomaterials. Please answer in detail the following questions:
   a) Explain what you understand for nanomaterial. Give one example of one remarkable properties of a material when it is obtained in a nanometric size and explain why.
   b) The presence of defects is one of the reasons for the outstanding properties of nanomaterials. The defects can be classified according to their dimensions. Explain this classification.
   c) We have seen during the course that several oxides reach remarkable properties when they are obtained in nanosize range. Give one example of this type of materials and the reason to have that outstanding property.

2. Laura Rioja-Monllor explained her work on $La_{0.5}Ba_{0.5}CoO_3$-$BaZrO_3$ nanocomposites as electrodes for proton conducting fuel cells.
   a) Explain the method that she uses for the synthesis of these materials.
   b) A common problem that the scientists are facing to keep the outstanding properties of nanomaterials is the so-called sintering issue. Explain what is this and give a couple of manners to prevent it.
   c) A part from the method that Laura uses we have covered during the course other methods to synthesize oxides with nanometric sizes. Name and explain them in a couple of lines.

3. Both Laura Rioja-Monllor and Antoine Dalod use advanced characterization techniques to determine the structure and the morphology of their nanoparticles.
   a) Explain the difference between the different electron microscopy techniques that we have seen in class. Give an example of a situation that would be more suitable to use one technique or the other.
   b) What is EDS and EELS? Could you tell me the difference between them?
   c) In plus of the electron microscopy techniques we have seen other microscopy techniques. Which are they? Explain in a couple of lines the principles of each one.