1. Oral part: Describe the linear theory (I think Newton limit is a better term) of Relativity, its importance and show this in the case of the Einstein eq. Also, discuss the applications we have seen in the lectures. Extra questions on oral part: describe which approximation in this linear theory is not valid any more in these applications + Assume 2 neutron stars, can you apply this linear theory?

2. Ex1: I had to prove eq (3.176) in Carroll and consider the case that the potential A_{mu} in Maxwell is a Killing vector (thus can use the above identity) and prove that the 2 Maxwell equations hold in this case.

3. Ex2: Consider the case that the A_{mu} has only non-zero time component and solve the spherical symmetric solution of Einstein in a Maxwell field in 5D (yes, you read that right). The general spherical symmetric solution in 5D is given to you and you need to find its components (which you need to discuss its time dependence) + describe its killing vectors + event horizon + (don't remember anymore...)