1 Problem 1.

2 Problem 2.

Since X is pof, it is orbit-finite. Since given relation is equivariant, each orbit of X is either entirely contained within one equivalence class or each element of the orbit is in a different equivalence class.

If the first case holds for every orbit, then ever equivalence class is a union of orbits, therefore:

- There are finitely many equivalence classes.
- Each equivalence class is equivariant.

If the second case holds for at least one orbit, than:

- There are infinitely many equivalence classes (because an orbit has one or infinitely many elements and if it had only one, the first case would hold).
- Not every equivalence class is equivariant, because elements of the same orbit are by definition equivariantly indistinguishable.

T.H.M.W.

3 Problem 3.