

### Homework 3 (10 points)

1. From the Lagrange density of free electromagnetic field obtain Maxwell equations. Demonstrate the gauge invariance of the Lagrange density.

2. Show that from the requirement of the local phase invariance of the Schrodinger equation of charge particle follows the minimal substitution principle.

3. Assume that the wave function entering the Schroedinger equation is invariattn with resepect to the global transformation  $U$ .

If now this transformation is local, what should be the transforamtion properties of interacing field in order the Schroedinger equation remain invariant.