This is a preliminary version. Some changes may still occur.

Problem 25. *–Spin and angular momentum*
Consider free Dirac-particle where

$$H = c\vec{\sigma}\cdot\vec{p} + \beta m_0 c^2$$

Show, that neither he angular momentum $\hat{\vec{L}}$ nor the spin $\hat{\vec{S}}$ are conserved, but the sum of the two $\hat{\vec{J}} = \hat{\vec{L}} + \hat{\vec{S}}$ is.

Problem 26. *–Lorentz transformation again*
Show, that the following values transform under Lorentz-transformation as stated:

$\bar{\Psi}\Psi$	Scalar
$\bar{\Psi}\gamma_5\Psi$	Pseudo-scalar
$\bar{\Psi}\gamma_\mu\Psi$	Lorentz-vector
$\bar{\Psi}\gamma_5\gamma_\mu\Psi$	axial Lorentz-vector
$\bar{\Psi}\sigma^{\mu\nu}\Psi$	second order Lorentz-tensor