6.15 (a) Since $\vec{E}$ must be proportional to $\vec{J}$, and $\vec{E}$ and $\vec{J}$ are both odd under spatial inversion, while magnetic field is even under spatial inversion, combination with magnetic field is allowed. To second order we must have

$$\vec{E} = \rho_0 \vec{J} + R(\vec{H} \times \vec{J}) + \beta_1 (\vec{H} \cdot \vec{H}) \vec{J} + \beta_2 (\vec{H} \cdot \vec{J}) \vec{H}.$$

(b) Since $\vec{E}$ is even under time reversal and $\vec{H}$ and $\vec{J}$ odd, then ρ_0, β_1, β_2 are odd under time reversal, i.e., pseudoscalar, while R is a scalar.