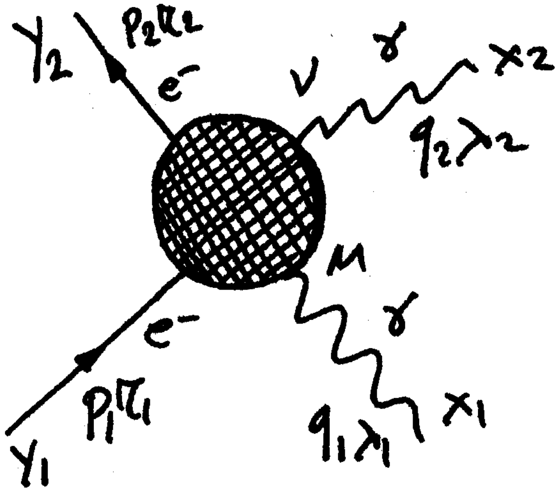
(10) Consider the process:

(10)



$e^- \gamma \to e^- \gamma$

Show that the amplitude for this process is:

$$
{}_{out}\langle p_2 \pi_2 q_2 \lambda_2 | p_1 \pi_1 q_1 \lambda_1 \rangle_{IN} = \frac{1}{\sqrt{(2\pi)^3 2 q_1^0}} \times \frac{1}{\sqrt{(2\pi)^3 2 q_2^0}} \times \sqrt{\frac{M \cdot M}{(2\pi)^3 (2\pi)^3 E_{p_1} E_{p_2}}}
$$

$$
q_1^2 \cdot q_2^2 \left[\tilde{U}_{\pi_2}(\vec{p}_2) (\gamma \cdot p - M) \right]_\beta \epsilon_\nu(\lambda_2) \times
$$

$$
\int d^4x_1 \int d^4x_2 \int d^4y_1 \int d^4y_2 \, e^{-i(p_1 y_1 + q_1 x_1 - p_2 y_2 - q_2 x_2)} \times
$$

$$
\langle 0 | T \left\{ \psi_\beta(y_2) A^\nu(x_2) A^\mu(x_1) \tilde{\psi}_\alpha(y_1) \, e^{-ie \int d^4u \, A_\mu(u) \tilde{\psi}(u) \gamma^\mu \psi(u)} \right\} | 0 \rangle \times
$$

$$
\left[(\gamma \cdot p_1 - M) U_{\pi_1}(p_1) \right]_\alpha \epsilon^*_\mu(\lambda_1 q_1)
$$