Problem 4

Let $(\Omega, \mathcal{F}, P)$ be a probability space and X_t the stock price following a geometric Brownian motion. A call option c_t is written on this stock with maturity T and exercice price K. The discount option price process is $\bar{c}_t$, where $\bar{c}_t = D_t c_t$, $D_t = e^{-rt}$ is the unit of the money market account and r is the risk free interest rate. Show that $\bar{c}_t$ is a martingale under the EMM Q.