NAME:

ECON 603
Macroeconomic Theory   **12 December 2010**
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Midterm

1. (**50 points**) Suppose that utility function U of a representative agent is $U = \alpha \cdot Ln[C] + (1 - \alpha)Ln[l]$, where C is consumption of physical goods and l is consumption of leisure. Suppose that production technology is represented by $Y = A\overline{K}^\alpha N^{1-\alpha}$ where A is productivity parameter, $\overline{K}$ is a given amount of physical capital stock, and N is labor stock. We assume that $h = l + N$, w is the real wage, and π is real profit. There is no government in the economy. Find the optimal values of C, l, N, w, Y, and U under the competitive equilibrium (market solution).

2. (**50 points**) Suppose that there is a two-period model with no production in the first period. Utility function U of a representative agent is $U = Ln[C_1] + \frac{1}{1+\rho} \cdot \left[Ln[C_2] + Ln[l_2]\right]$, and the production function in the second period is $Y_2 = K_2^\alpha \cdot N_2^{1-\alpha}$. We assume that capital depreciates completely after production, and so, the firm must pay the principal and interest on capital entirely from output. Find the equilibrium values of C_1, C_2, l_2, etc. Hint: Recall that fist period budget constraint is $C_1 + S = Y_1$ and the second period budget constraint is $C_2 = w_2 \cdot N_2^s + (1 + r_2) \cdot S$.