Stuff related to Economics 704, Victor Rios Rull

In the following there are 9 questions for 100 points. Be as BRIEF as you can and good luck.

Workers, and Entrepreneurs in a Growth Model

Consider an economy with a large measure of infinitely lived agents. They have one unit of time and depending on what they do their utility takes two levels indexed $u^i \in \{0, 1\}$, for i either entrepreneur $i = 0$ or worker $i = 1$. Preferences are given by $\log c - \chi\, u^i$, with $\chi > 0$, and . They discount the future at rate $\beta \in (0, 1)$.

Households have a stochastic shock to their ability in each activity s^i that follows a Markov chain with transition Γ^s. The ability to be a worker oscillates between high and low $\{\ell, h\} = \{2/3, 4/3\}$, while that of being an entrepreneur is $s^{e_j} = 0, 1, 3, 5$.

An agent if chooses to be an entrepreneur has to use its time to manage a decreasing production function $s^{e_i}\ f(k, n)$ where n is the amount of efficiency units of labor that they it hires. Capital depreciates at rate δ.

Workers supply their unit of time in a labor market and they get paid their ability times the price of an efficient units of labor.

Assume first that the only asset is capital that can be rented out to entrepreneurs and that the economy is in steady state.

1. (5 points) What is the state of a household?
2. (20 points) Assume that the household chooses its savings conditional on what activity it is undertaking. Write down the problem of a household, explicitly distinguishing the choices of savings, activities and hiring if any.
3. (15 points) Define a steady state.
4. (10 points) Define a set of natural borrowing constraint for entrepreneurs if the shocks are iid. Do they depend on their wealth? What about on their entrepreneurial ability?
5. (10 points) If the shocks are persistent, and if there is no possibility of borrowing is it possible that two workers with the same working ability and wealth save different amounts? Explain why.

   Imagine now that there is also a corporate sector that operates a constant returns to scale production $F(K, N)$
6. (15 points) How does the steady state differ from the previous one?

Monopolistic Competition

Imagine that preferences of a representative consumer in a static closed economy are given by

$$u(\{c(i)\}_{i\in[0,A]}, n) = \left(\int_0^A c(i)^{\frac{\epsilon-1}{\epsilon}}\, di\right)^{\frac{\theta\epsilon}{\epsilon-1}} - \chi\ n^2$$

Where $1-n$ is leisure and n is time spent working. Output is produced with one unit of labor that is taken to be the numeraire. The consumers are workers while firms are owned by foreigners.

7. (10 points) Give an expression for the price that each firm charges.

8. (10 points) What is the value of the firm?

   Imagine now that the consumers also own the firms.

9. (10 points) How does the equilibrium allocation change relative to the case where foreigners own the firms. (Hint: verify that total income earned is equal to total expenditures.)