**MACROECONOMICS 2018**

**Simulation first mid term test (18 May 2018)**

**Prof. Nicola Dimitri**

 **(90 mins)**

1. In the continuous time version of the Ramsey model discussed in class find the Hamiltonian, the Ramsey-Keynes optimal conditions and discuss the stationary states and phase diagram under the following hypotheses on the population growth rate $\frac{\dot{N}\_{t}}{N\_{t}}=\frac{n}{k\_{t}}$, assuming the rest of the model to be the same

1. Consider the following (slightly modified) version of the Cagan demand function seen in class with rational expectations

$$m\_{t}-p\_{t}=-α\left(E\left(I\_{t}\right)-p\_{t}\right)+p\_{t}$$

Find the fundamental solution for $p\_{t}$.

Moreover, discuss if the following stochastic process $b\_{t}$, with values and probabilities given by

$$b\_{t}=\left\{\begin{array}{c}\frac{b\_{t-1}}{a^{3}} with probability a\\ b\_{t-1} with probability 1-a\end{array}\right.$$

where $a=\frac{α}{2+α}$, can be a bubble process part of the model solution.

**Content 1 part**

Adaptive expectations, rational ,expectations, Ramsey model in continuous time, Ramsey model in discrete time.

**Rules 1° mid term test**

We remind that students can keep the grade of the first mid term until theofficial sessions of September 2018 (included). The second part of the course test could be taken on the second mid term test (first half of June 2018) or on any official exam session in June, Jyly and September 2018 (included). Those who fail trhe second part, or pass but reject the grade, will have to re-take the whole test, first part included.

**Additional problem**

Do problem 1 of the simulation in discrete time, now with $\frac{N\_{t+1}}{N\_{t}}=\frac{(1+n)}{k\_{t}}$