

**ECON 603**  
**Macroeconomic Theory**  
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**Final**

**1. (40 points)** Suppose that people have two period economic lives in overlapping-generations framework and do not care about future generations (there are no bequests). We represent the young-hood by subscript  $Y$  and the old-hood by  $O$ . We define the overall utility function of the representative consumer in cohort  $t$ /period  $t$  as  $U = u(c_{t,Y}) + \frac{1}{1+\rho} u(c_{t+1,O})$  where  $c_{t,Y}$  is the real consumption of the representative consumer in cohort  $t$  when she/he is young and  $(c_{t+1,O})$  is the real consumption of the same consumer when she/he is old. As before,  $\rho$  is the subjective rate of discount. We assume that each consumer supplies one unit of labor inelastically. We continue to assume that utility function is  $U(c) = \frac{c^{1-\theta}-1}{1-\theta}$  where  $\theta$  is *elasticity of marginal utility*. We presume that the consumer generates only labor income in the young-hood and only interest income in the old-hood. Solve the competitive equilibrium solution of this basic overlapping-generations model and comment on them.

**2. (30 points)** Present and discuss the social planner's solution of Lucas (1988) **without externality** model.

**3. (30 points)** Present and discuss the Romer (1990) model.