1. [10 marks] In his essay The Methodology of Positive Economics, Milton Friedman draws a distinction between what he calls positive and normative economics. Explain and give an example of each.

2. [10 marks] In an economy consisting of more than two people, explain how it is possible to have multilateral gains to trade even in the absence of bilateral gains to trade. Explain why, in the absence of any frictions, money is not needed to circumvent the lack of double coincidence of wants in such an economy.
3. [10 marks] Consider two agents who wish to enter into a credit relationship. At any point in time in the relationship, one of the two agents will be a debtor and the other a creditor—at least, if debtors could always be relied upon to keep their promises. But if commitment is lacking, credit may not be extended. Explain how the use of an exchange medium may nevertheless rescue the situation. In particular, explain how a “sale and repurchase agreement” can be used to support intertemporal exchange. Relate the phenomenon to the practice of using collateral in a debt contract.

4. [10 marks] Define the terms *money neutrality* and *money superneutrality*. Describe what types of monetary policy actions are likely to be neutral and non-neutral, respectively. Describe what types of monetary policies are likely to be superneutral and not superneutral, respectively. (Explain in words only.)
5. [40 marks] Consider an economy consisting of two-period-lived overlapping generations (and an initial old generation, who live for one period only, and care only for immediate consumption). Let $N_t = nN_{t-1}$ denote population dynamics, where $N_t$ denotes the number of young people at date $t$. The young of each generation have preferences $U(c^y, c^o)$ and are endowed with $y$ units of nonstorable output. Let $MRS(c^y, c^o)$ denote the marginal rate of substitution between time-dated consumption goods.

(a) Consider the problem of maximizing $U(c^y, c^o)$ subject to resource feasibility. Write down the mathematical conditions that describe the solution, and depict the solution on a diagram.

(b) Describe the set of frictions that are necessary here to motivate the need for monetary exchange, and explain why these frictions are necessary.

(c) Assume that the initial old are endowed with $M_0/N_0$ dollars of fiat money each. Let $\{p_t\}_{t=1}^\infty$ denote a sequence of price-levels ($0 < p_t < \infty$ for all $t$). Assume that each old person receives a lump-sum transfer of cash equal to $T_t/N_{t-1}$ dollars per old person. Write down the budget constraint for an initial old agent, and write down the sequence of budget constraints facing a typical young person.
(d) Now combine the sequence of constraints for a young person into a single life-time budget constraint, and state the decision problem faced by a typical young person. Write down the mathematical conditions that describe the solution to this problem, and depict on a graph.

(e) Assume that the only source of government revenue is money creation, and let $M_t = \mu M_{t-1}$. Write down the government budget constraint.

(f) Write down the market-clearing conditions and derive the (stationary) equilibrium rate of inflation for an arbitrary $\mu$. 
(g) Write down the mathematical conditions that describe the competitive monetary equilibrium. Prove that the equilibrium allocation lies on the feasible line.

(h) Prove that the monetary equilibrium is inefficient for any strictly positive money growth rate $\mu > 1$. Explain.