Preparatory Semester 2011

Macroeconomics Final Examination

1. The long run date show that (1) the capital income share and the labor income share are constant over time; (2) the return to capital is constant over time; (3) the capital-output ratio is constant over time. Consider the following aggregate model. The production function is $Y_t = A_t K_t^{\alpha} L_t^{1-\alpha}$. The productivity grows at the rate γ: $A_{t+1} = \gamma A_t$. The labor supply stays constant over time: $L_t = \bar{L}$. The capital evolves according to $K_{t+1} = K_t(1-\delta) + s \cdot Y_t$, where s is the saving rate. Show that this aggregate model can account for the three growth facts.

2. Consider the following hypotheses. (1) The work hours do not change as the wage rate rises over time. (2) The work hours decline as the wage tax rate rises to fund the social programs like public schools and health services. Consider the following model. The consumer's utility is $\log(C+G) - L$, where C is the private consumption; G is the public goods consumption; and L is the work hours. The consumer's budget constraint is $C \leq (1-\tau) \cdot w \cdot L$, where w is the wage rate and τ is the tax rate. The budget constraint of the government is $G = \tau \cdot w \cdot L$. Show that this model of the consumer and the government yields the two hypotheses on work hours.

3. Suppose that the government promises a generous public pension for all workers without raising any taxes. Some people worry about the unfunded liability that would burden the next generation. Make an argument that there is no need to worry about the liability. Make use of an analytical model as necessary. Make your assumptions clear.

4. Suppose that the recession is coming and everyone is expecting that the central bank will pursue an expansionary monetary policy resulting in a high rate of inflation. Make an argument that the expected policy will not be effective in moderating the recession but that the recession will be even worse if the central bank does not pursue the expected policy. Make use of an analytical model as necessary. Make your assumptions clear.