Name:_____

Intermediate Macroeconomic Theory II, Winter 2010
Instructor: Dmytro Hryshko
Final Exam (58 points). April 21.

1. (**5 points**) Suppose that the only shocks in the *closed* economy are changes in the assessments of expected inflation π^e, and that the central bank is considering which policy to implement:

   - keeping the money stock constant, letting the interest rate to adjust or
   - keeping the **NOMINAL** interest rate constant, adjusting the money stock.

   Which policy leads to smaller fluctuations in real GDP in response to the economy's shocks? Draw an appropriate IS–LM schedule. (*Hint*: you may use the IS–LM schedule as in the textbook's discussion of the Great Depression, with nominal interest rate on the vertical axis and real GDP on the horizontal axis.)

2. (**13 points**) Let the economy's production function be $Y = 10K^{1/5}(EL)^{4/5}$.
Households save 10% of their income;
population growth, n, is equal to 2%;
the depreciation rate, δ, is equal to 2%;
the growth rate in the efficiency of labor, g, is 2%.

   (a) (**2 points**) Show that the aggregate production function is constant returns to scale in K and L (**1 point**), and express the production function in *per-effective-worker* terms (**1 point**).

   (b) (**1 point**) Is production function increasing/constant/decreasing returns to scale in its 3 inputs, K, E, and L? *Show* how you arrived at the conclusion.

   (c) (**1 point**) If you are a social planner who maximizes consumption per worker in the economy, what savings rate would you choose? (You don't need to show your calculations here if you see the answer.)

(d) (**2 points**) Is the real interest rate under the economy's current savings rate (10%) higher/lower/the same as the real interest rate when the economy is in the golden rule steady state? If the interest rates differ, briefly argue why one is higher than another. (*Hint*: You don't need to show any calculations here.)

(e) (**1 point**) What is the growth rate of total output on a balanced growth path?

(f) (**2 points**) What is the growth rate of the real wage in the economy? What is the growth rate of the real interest rate?

(g) (**1 point**) What is the share of capital and labor costs in total income?

(h) (**2 points**) Assume the economy is on a balanced growth path. Let the production function be $Y = BK^{1/5}L^{4/5}$, where $B = 10E^{4/5}$, and B is the total factor productivity. What is the contribution of the total factor productivity towards the growth in total output? That is, calculate $\frac{\Delta B/B}{\Delta Y/Y}$.

(i) (**1 point**) Is the following statement true or not? For the just described economy, consumption per worker will be higher in the steady state with the savings rate equal to 30% rather than 20%.

3. (**40 points**)

(a) (**5 points**) Use the Mundell-Fleming model to predict the effects of the introduction of a stylish line of Toyotas that makes some consumers prefer foreign cars over domestic cars on aggregate income, the exchange rate, and the trade balance in a small open economy with a <u>fixed</u> exchange rate regime.

(b) (**5 points**) Use the Mundell-Fleming model to predict the effects of the introduction of ATMs that leads to a fall in the domestic demand for money on aggregate income, the exchange rate, and the trade balance in a small open economy with a floating exchange rate regime.

(c) (**5 points**) Use the Mundell-Fleming model to predict the effects of the introduction of an import quota on aggregate income, the exchange rate, and the trade balance, *and* the level of exports in a small open economy with a floating exchange rate regime.

(d) (**5 points**) Consider a closed economy at its long-run equilibrium. Suppose a reduction in autonomous investment, say due to investors' pessimism. Discuss both the short- and long-run effects of the change on the equilibrium values of output, the real interest rate, consumption, investment, the price level, and the real money balances. (Use both the IS-LM and AD-AS schedules.)

(e) (**5 points**) Suppose the government reduces lump-sum taxes with no change in government purchases. Suppose that some survey evidence reveals that as a result of this change consumption of the families with very young heads and low-educated heads has increased, while the consumption change of the rest of the families virtually did not change. Discuss this observation in light of Ricardian equivalence; define the Ricardian equivalence.

(f) (**5 points**) What is the essence of the Lucas critique? Discuss the issue in terms of either consumption function or the short-run inflation-unemployment tradeoff.

(g) (**5 points**) Consider a closed Solow economy with no population and technological growth at its steady state. Suppose there is a sudden inflow of immigrants into the economy that raises working population. Assume that this is the only change in the economy, and the fundamental parameters of the economy such as the savings rate, the aggregate technology, depreciation rate, population and technological growth rates remain unaltered. Briefly discuss the changes in the economy in the short and very long runs. Draw a diagram.

(h) (**5 points**) Suppose that a breakthrough technology was invented in a closed economy. You can interpret this as a beneficial *permanent* supply shock; in the *long run*, the costs of producing one unit of output go down and the economy can produce more for a given amount of capital and labor. Assume that firms in the economy are not affected by this event in the *short run* and the prices stay stable in the *short run*. Discuss both the short- and long-run effects of the "shock" on the equilibrium values of output, the real interest rate, consumption, investment, the price level, and the real money balances. (Use both the IS–LM and AD–AS diagrams.)