Instructions: Answer all the questions. Write the answer in the space immediately following each question in either Chinese or English. Be concise in your economic reasoning.

1. In a two-period model economy, a household receives endowment income y_1 and y_2 and pays lump-sum taxes t_1 and t_2 in periods 1 and 2, respectively. In period 1, the household makes consumption decisions (c_1 and c_2) and saving decision ($s_1 > 0$) to maximize life-time utility, described as

$$\max_{c_1, c_2, s_1} \log c_1 + \beta \log c_2 \qquad (1)$$

where $0 < \beta < 1$ is the discount factor. s_1 earns interest income at an exogenous *net* rate r in period 2.

   1) Write down the household's budget constraint of period 1. (3 points)

   2) Write down the household's budget constraint of period 2. (3 points)

   3) Derive the life-time intertemporal budget constraint of the household. (Hint: Discount the budget of period 2 with the *gross* interest rate before adding it to the budget of period 1.) (4 points)

   4) Show that the household's periodic utility ($\log c$) exhibits positive but diminishing marginal utility. Also, draw a crude diagram of the household's marginal utility, which has the consumption level (c) in the x-axis and marginal utility (MU) in the y-axis. (12 points)

5) Solve the utility maximization problem (1), subject to the life-time budget constraint, and show that the Euler (consumption optimality) condition is $\frac{1}{c_1} = \frac{1}{c_2}\beta(1 + r)$. (16 points)

6) Interpret the Euler condition by explaining the economic effect of varying the interest rate (r) and the discount factor (β) on optimal consumption and saving decisions. (14 points)

2. Japanese Prime Minister Abe has initiated "three arrows" to revive the economy since 2013. One of the arrows is to have Bank of Japan conduct quantitative easing through increasing asset purchases of Japanese government bond.

   1) Describe the rationale of such a policy and evaluate its macroeconomic effects on prices, the exchange rate, exports, and imports; make sure you provide economic reasoning for your answers. (12 points)

   2) Do you think such a policy is suitable for Taiwan in promoting economic growth in the short and long runs? Why or why not? (6 points)

3. Describe *one* of the major differences between GDP deflator and CPI inflation? (10 points)

4. Oil prices have started a downward trend since October 2014. What are the possible macroeconomic effects of this trend for an oil-importing economy (Make sure you analyze from both consumers' and firms' perspectives? Provide an example of such an economy. (10 points)

5. Most economists believe that Russia is on the verge of recession in 2015, and its currency, ruble, has sharply depreciated since August 2014. Provide one cause (economic or political) that led to the recent economic turmoil in Russia. Make sure that you link the cause with economic consequences. (10 points)