Stockholm University

Department of Economics

Course name:	**Intermediate Macroeconomics**
Course code:	**EC2201**
Type of exam:	**MAIN**
Examiner:	**Anna Seim**
Number of credits:	**7,5 credits**
Date of exam:	**Tuesday March 14 2017**
Examination time:	**5 hours (09:00-14:00)**

Write your identification number on each answer sheet (the number stated in the upper right hand corner on your exam cover).

Explain notions/concepts and symbols. If you think that a question is vaguely formulated, specify the conditions used for solving it. Only legible exams will be marked. **No aids are allowed.**

Question 4 may be answered in English or Swedish. All other questions should be answered in English.

The exam consists of 5 questions, worth 100 points in total. The maximum points on each question are stated within parenthesis. For the grade E 45 points are required, for D 50 points, C 60 points, B 75 points and A 90 points.

Only students who have NOT received course credit from the seminar exercises should answer Question 5. Students who have obtained course credit automatically receive 10 points on that question, and get no extra points from answering it.

Your results will be made available on your “My Studies” account **(**www.mitt.su.se) on April 4 2017 at the latest.

Good luck!

Question 1: Short questions (25 points in total)

Provide short answers to all of these questions. (5 points each)

a. Consider a household living for two periods. Let c_t and y_t denote consumption and income, respectively, in period $t = 1,2$. r denotes the interest rate and $\beta \in [0,1]$ is a parameter. The household faces the following maximisation problem:

$$\max_{c_1,c_2} U(c_1, c_2) = u(c_1) + \beta u(c_2),$$

subject to

$$c_1 + \frac{c_2}{(1+r)} = y_1 + \frac{y_2}{(1+r)}.$$

Derive the Euler equation and interpret the expression.

b. Draw a hypothetical Beveridge curve in a diagram. Briefly discuss what factors might shift the Beveridge curve outwards. Should policy makers worry about such shifts?

c. Explain why wage rigidity may give rise to involuntary unemployment, preferably using a diagram. State at least two causes of wage rigidity.

d. Derive an expression for the nominal exchange rate using the monetary approach to the exchange rate. Explain whether this is a long-run or a short-run model.

e. Explain how the current account is affected by a real exchange rate depreciation in the short-run and in the long-run. There is no need to derive the Marshall-Lerner condition but you should explain how the current account is affected over different horizons, preferably using a diagram.

Question 2: Economic growth (25 points)

Consider a version of the Solow model where population grows at the constant rate $n > 0$, but there is no technological progress. Capital depreciates at rate δ each period and a fraction s of income is invested in physical capital every period. Assume that the production function is given by:

$$Y_t = AK_t^{\alpha} L_t^{1-\alpha},$$

where Y_t is output, K_t is capital and L_t is labour. Total factor productivity, A, is constant and $\alpha \epsilon (0,1)$.

a. Show that the production function exhibits constant returns to scale, i.e. is homogenous of degree 1. (2 points)

b. Derive an expression for the accumulation of capital per worker in this economy, i.e. Δk_{t+1} where $k_t \equiv K_t/L_t$. (6 points)

c. What is the steady-state condition in this economy? Explain the intuition behind the equilibrium condition and illustrate the steady state in a diagram. (6 points)

d. What happens to capital and output per worker if the population suddenly stops growing so that $n = 0$? Illustrate your answer in a diagram. (5 points)

e. What are the main criticisms of the Solow model? (6 points)

Question 3: Monetary policy (20 points)

Consider an economy that is characterised by the following Phillips curve:

$$u = u^n - \theta(\pi - \pi^e),$$

where u is unemployment, u^n is the natural rate of unemployment, π is inflation, π^e is inflation expectations and $\theta > 0$ is a parameter. Suppose that the loss function of the central bank is given by:

$$L(u, \pi) = u + \frac{\gamma}{2}\pi^2.$$

where $\gamma > 0$ is a parameter. Agents are assumed to be rational and form their expectations prior to the central bank setting monetary policy.

a. Describe the equilibrium in this economy if the central bank commits to $\pi = 0$ and is believed by the public. (2 points)

b. Compute optimal monetary policy under discretion. What is unemployment under this policy? (5 points)

c. Compute the central bank's loss under commitment to zero inflation and under discretion. Compare the two and discuss your results. (5 points)

d. Discuss different solutions to the time-inconsistency problem. How has it been addressed in practice? (4 points)

e. In recent years, many inflation targeting central banks have been struggling with inflation being too low, and some even with deflation. Explain why deflation may be a problem. (4 points)

Question 4: Government deficits and debt (20 points)

This is an essay question. Please be brief and to the point. Write no more than 4 pages. Only legible answers will be considered.

According to the Ricardian view, the level of government debt should be of little or no importance for macroeconomic performance. The recent European experience suggests otherwise. Your task is to discuss the following issues:

- Why do governments tend to run deficits and accumulate debt?

- Explain how budget deficits affect debt dynamics and why excessive government debt may quickly become a large problem.

- What advice would you give to a heavily indebted government?

Question 5: (10 points)

This question should only be answered by students who have not obtained credit by attending the seminar series.

Consider a labour market where the unemployed can be divided into two groups: "white-collar workers" and "blue-collar workers". The number of unemployed white-collar workers is denoted U_w and they find work at rate f_w each time period. The number of unemployed blue-collar workers is denoted U_b and their job-finding rate is f_b. The white-collar workers find jobs twice as easily as the blue-collar workers, so that $f_w = 2f_b$. L denotes the total labour force and a fraction s of the employed are separated from their jobs every period. Assume that a fraction g of the unemployed are white-collar workers.

a. Derive an expression for the aggregate unemployment rate, $u = (U_w + U_b)/L$ in steady state. u is to be expressed in terms of s, g and f_b. (5 points)

b. Explain what is meant by frictional and structural unemployment. Briefly discuss which type of unemployment we should be more worried about. (5 points)