Stockholm University

Department of Economics

Course name:	**Intermediate macroeconomics**
Course code:	**EC2201**
Type of exam:	**Retake Exam**
Examiner:	**Anna Seim**
Number of credits:	**7,5 credits**
Date of exam:	**Saturday May 5 2018**
Examination time:	**5 hours (09:00-14:00)**

Write your exam 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.

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.

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

Your results will be made available on your Ladok account **(**www.student.ladok.se) within 15 working days from the date of the examination.

Good luck!

Question 1: Short questions (25 points in total)

Please write no more than one page when answering each of these questions.

a. According to economic theory discussed in the course, how is the nominal exchange rate determined in the long run? (5 points)

b. According to economic theory discussed in the course, how is the nominal exchange rate determined in the short run? (5 points)

c. Explain what is meant by deficit bias and state three reasons for why it may arise. (5 points)

d. Use the national income identity to derive an expression showing how aggregate saving and investment are related in a small open economy. (5 points)

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

$$u = \overline{u} - \theta(\pi - \pi^e),$$

where u is unemployment, $\overline{u}$ 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:

$$L(u, \pi) = u + \frac{3}{2}\pi^2.$$

Agents are assumed to be rational. Compute inflation and unemployment (i) if the central bank commits to $\pi = 0$ and is believed by the public; (ii) if the central bank acts under discretion. (5 points)

Question 2: Economic growth (20 points)

Consider a version of the Solow model where the population growth rate is 0.05. 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:

$$Y_t = K_t^{1/2} L_t^{1/2},$$

where Y_t is output, K_t is capital and L_t is labour.

a. Derive an expression for the accumulation of capital per worker in this economy, i.e. Δk_{t+1} where $k_t \equiv K_t/L_t$. (7 points)

b. 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)

c. What happens to capital and output per worker if the saving rate decreases? Illustrate your answer in a diagram and explain the mechanisms behind the transition to the new steady state. (5 points)

d. What is the main criticism of the Solow model? (2 points)

Question 3: The AS-AD model (25 points)

Consider the AS-AD model of a closed economy discussed in the course.

a. Write down the expressions for the AS and AD curves and interpret the expressions: what is the intuition behind the two curves? What must be true of the model parameters and variables in the long-run equilibrium, i.e. in the steady state? (8 points)

b. Analyse the effects of a supply shock that causes a temporary increase in inflation, using a diagram. Assume that the shock lasts for one period and then assumes the value zero. Describe the mechanisms that bring the economy back to long-run equilibrium. What happens to aggregate demand? (6 points)

c. Consider an economy that starts out in steady state when the central bank decides to make the inflation target more ambitious. Analyse the effects of a decrease in the inflation target from $\bar{\pi}$ to $\bar{\pi}'$. Explain the mechanisms behind the adjustment to the new steady state. (8 points)

d. How would the slope of the AS and AD curves be affected if we instead were to consider an open economy? No derivations are needed, but please motivate your answer. (3 points)

Question 4: Unemployment and economic policy (20 points)

This is an essay question where you are expected to refer to economic theories and concepts used in the course. Please be brief and to the point. Write no more than 3 pages (maximum). Only legible answers will be considered.

Your task is to explain how employment and/or unemployment is determined according to theories discussed in the course. You may choose to focus on either variable or both.

What policy advice would you give to a government trying to reduce unemployment?

Question 5: (10 points)

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

Consider a household living for two periods. The intertemporal budget constraint is given by

$$c_1 + \frac{c_2}{1+r} = y_1 + \frac{y_2}{1+r},$$

where c is consumption, y is income and r is the interest rate. The household's preferences are characterised by the utility function

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

where $u(c_t)$ is the period utility function and $\beta < 1$ is the discount factor.

a. Formulate the household's optimisation problem and derive the Euler equation. (5 points)

b. Suppose that $u(c_t) = \ln c_t$, that $r = 0$ and $\beta = 1$. Solve for the levels of optimal consumption, i.e. c_1 and c_2. (5 points)