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| Course name: | INTERMEDIATE MACROECONOMICS |
| Course code: | EC2201 |
| Type of exam: | Main. |
| Examiner: | Anna Seim. |
| Number of credits: | 7.5. |
| Date of exam: | Sunday March 24 2019. |
| Examination time: | 5 hours (9:00-14:00). |
| Aids: | No aids are allowed. |

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

Start each new question on a new answer sheet.

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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.

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The exam consists of 5 questions, worth 100 points in total. The maximum number of points on each sub-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.

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

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

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**Good luck!**

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**Question 1: Short questions (25 points in total)**

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

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. (5 points)

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

c. Consider a labour market where the matching function is given by the following function:

$$m(u, v) = u^{\theta} v^{1-\theta}$$

where $u$ is the unemployment, $v$ is the vacancy rate and $\theta \in (0,1)$ is a parameter. Show that the matching function is homogenous of degree 1, i.e. exhibits constant returns to scale. (5 points)

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

e. Is inflation a monetary phenomenon or a fiscal phenomenon? Motivate your answer by referring to theories discussed in class. (5 points)

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**Question 2: Economic growth (25 points)**

Consider a version of the Solow model where the population, $L_t$, grows at rate $n$ and labour efficiency, $E_t$, grows at rate $g$. A fraction $s$ of income is invested in capital, $K_t$, every period and capital depreciates at rate $\delta$. The production technology is Cobb-Douglas and given by:

$$Y_t = K_t^{\alpha}(E_t L_t)^{1-\alpha}$$

where $\alpha \in (0,1)$.

a. Derive an expression for the accumulation of capital per efficiency unit of labour in this economy, i.e. $\Delta k_{t+1}$, where $k_t \equiv K_t/(E_t L_t)$. (6 points)

b. What is the steady state condition in this economy? Illustrate the equilibrium in a diagram. (6 points)

c. Explain why the economy reaches the steady state, i.e. describe the mechanism. (4 points).

d. Suppose that there is a decrease in the depreciation rate, $\delta$. Analyze the effects of such a decrease, using a diagram. Explain the intuition. (6 points)

e. Consider an economy where the production technology instead exhibits constant returns to capital and is given by:

$$Y_t = AK_t$$

where TFP, $A$, is constant. A constant fraction, $s$, of income is still invested in capital in each period. There is no population growth but capital depreciates at rate $\delta$. Compute the GDP growth rate, i.e. $g \equiv (Y_{t+1} - Y_t)/Y_t$. (3 points)

**Question 3: The AS-AD model (20 points)**

Consider the AS-AD model discussed in the course. Assume that the real interest rate only affects investment, not net exports.

a. Write down the expressions for the AS and AD curves and illustrate the equilibrium in a diagram. (5 points)

b. 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? (6 points)

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c. Analyze 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 how the economy reaches the long-run equilibrium. (6 points)

d. Use the AS-curve and Okun's law to derive an expression for the Phillips curve in terms of cyclical unemployment. (3 points)

**Question 4: Alternative monetary regimes (20 points)**

*This is an essay question where you are supposed to refer to material covered in the course. Please be brief and to the point. You may answer in English or in Swedish. Write no more than 3 pages (maximum). Only legible answers will be considered.*

Most economists would argue that Sweden faces a choice between the following two monetary regimes:

1. Maintaining an inflation target combined with a flexible exchange rate.
2. Adopting the Euro.

Your task is to advise to the Swedish government on which regime to choose. Why is there a need for an explicit monetary regime to begin with? What are the pros and cons of domestic inflation targeting, combined with a floating exchange rate, versus adopting the Euro?

**Question 5: Debt dynamics**

*This is a credit question that should only be answered by students who have not received course credit from the seminar exercises. Students who have obtained course credit automatically receive 10 points on this question and cannot obtain extra points by answering it.*

a. Derive an expression for how the primary budget balance as a share of GDP and the existing debt-to-GDP ratio affect the change in the current debt-to-GDP ratio. (6 points)

b. Use the equation derived in question a. to discuss what is required to stabilize the debt ratio. Explain the trade-off that governments face when contemplating debt stabilization. (4 points)