Department of Economics

Course name:	**Labour Economics and Wage-Setting Theory**
Course code:	**EC7212**
Examiner:	**Lars Calmfors**
Number of credits:	**7,5 credits**
Date of exam:	**March 13, 2017**
Examination time:	**13.00 - 16.00 (3 hours)**

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

Use one sheet per question. 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.**

The exam consists of 4 questions. Question 1 is worth maximum 30 points, question 2 maximum 20 points, question 3 maximum 25 points and question 4 maximum 25 points. In sum maximum 100 points can be achieved in the exam. **Those who choose not to answer Question 4 can count the points achieved on the assignment instead**. **Those who choose to answer Question 4 can count the higher of the points achieved on the assignment and those achieved on the question.** When deciding what to do you should consider that spending time on Question 4 reduces the time that can be spent on the other questions and thus probably the number of points that can be achieved from them. 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 "My Studies" account (www.mitt.su.se) on April 3rd at the latest.

Good luck!

Question 1 (maximum 30 points)

Assume that we have an economy where only one good is produced. There is only one production factor: labour. The economy consists of firms which have one job slot each that is either filled or vacant. An employed worker produces a fixed output.

   (a) Write down and explain the expressions for the discounted present values of a filled job and an unfilled vacancy respectively. (Maximum 5 points)
   (b) Reformulate the equations in (a) to equations for the instantaneous asset returns (the instantaneous expected profit flows). Interpret the equations. (Maximum 5 points)
   (c) Use the equations in (b) to derive a labour demand equation relating labour market tightness to the wage. Explain why a higher wage leads to lower labour market tightness. (Maximum 5 points)
   (d) Show diagrammatically how the analysis of labour demand can be combined with the Beveridge curve to analyse how an increase in the wage will affect the unemployment rate. (Maximum 5 points)
   (e) Now introduce the assumption that the economy finds itself on a balanced growth path and redo the analysis in (a)-(d). Show also how a reduction in the economy's growth rate affects labour demand. Explain the intuition. (Maximum 10 points)

Question 2 (maximum 20 points)

Assume that an individual worker has the utility function $U = R(1 +\beta e/q) – e^2$, where $U =$ utility, $R =$ income, $e =$ effort, $q =$ the average wage in the economy, and $\beta > 0$ is a parameter. If a worker is not working $e = 0$. $R = w$, where $w =$ the wage, if a worker is working, otherwise $R = s$. The distribution of s is given by the cumulative distribution function $G(s)$. Output is given by $f(e) = e$. The number of firms is given by a free-entry zero profit condition.

   (a) Derive how the effort level is determined in a decentralised equilibrium when $\beta = 0$. What is the employment level? (Maximum 7 points)
   (b) Derive how the effort level is determined in a decentralised equilibrium when $\beta > 0$. What is the employment level? (Maximum 7 points)
   (c) Derive how effort is determined in a social optimum when $\beta > 0$. Is it higher or lower than in the decentralised equilibrium? Explain the intuition. (Maximum 6 points)

Question 3 (25 points)

Discuss how the differences between coordinated and uncoordinated collective wage bargaining can be analysed. How can pattern bargaining where one sector of the economy functions as wage leader be analysed? What relevance do the models you discuss have for understanding wage bargaining in Sweden?

Question 4 (maximum 25 points)

Only those who want to try to raise their grade relative to the assignment should answer this question.

   (a) Explain what is meant by the concept of duration dependence of unemployment. What should we expect theoretically if the unemployment benefit declines over time? (Maximum 6 points)

(b) Derive theoretically an equation showing how the conditional probability of exiting from unemployment (the hazard function) depends on the unconditional probability of exiting from unemployment and the survival function. (Maximum 7 points)

(c) Formulate and explain the proportional hazard function. (Maximum 7 points)

(d) Give some example of how natural experiments have been used to analyse the effects of unemployment benefits on the duration of unemployment. (Maximum 5 points)