Course name:	**Labour Economics and Wage-Setting Theory**
Course code:	**EC7212**
Examiner:	**Lars Calmfors**
Number of credits:	**7,5 credits**
Date of exam:	**29 May 2016**
Examination time:	**09.00-12.00**

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

Use one cover 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. Each question is worth maximum 25 points; maximum 100 points in total. **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 June 17 at the latest.

Good luck!

Question 1 (maximum 25 points)

Assume that jobs are heterogeneous, each requiring a different level of effort, $e > 0$, from the worker. Output on each job is $y = f(e)$ with $f'(e) > 0$, $f''(e) < 0$ and $f(0) = 0$. Workers are also heterogeneous with utility $u = R - e\theta$ where R = income and θ = disutility of work (which differs among workers). On a job $R = w$ where w = the wage. Without a job the worker's effort is $e = 0$. There is free entry, so the firm's profit from every job is zero.

   a) Characterise the worker's decision problem when choosing among jobs. Show the worker's first-order condition for the choice of a job. (Maximum 7 points)
   b) Show that a job with higher effort gives a higher wage (a compensating wage differential). (Maximum 4 points)
   c) Draw the production function and indifference curves in a diagram (with output = the wage and effort on the axes) and show that legal constraints on the effort level is welfare-decreasing for some workers. (Maximum 7 points)
   d) Show that the competitive equilibrium is also socially efficient. (Maximum 7 points)

Question 2 (maximum 25 points)

   (a) Explain why the matching function can be assumed to exhibit constant returns to scale in the number of vacancies and the number of unemployed (i.e. why it is homogeneous of degree one in vacancies and unemployed). (Maximum 7 points)
   (b) Assume that the matching function has the characteristics described in (a). Show that the rate at which vacancies are filled (the probability that a vacancy is filled) depends negatively on labour market tightness (the ratio between vacancies and unemployed). Show also that the job finding rate (the probability that an unemployed finds a job) depends positively on labour market tightness. (Maximum 4 points)
   (c) Assume that the labour force grows at a certain rate n and that there is an exogenous job separation rate q. Show how an equation defining the Beveridge curve can be derived. (Maximum 7 points)
   (d) Assume that there is a constant labour force, no discounting of the future, a fixed cost h of an unfilled vacancy, that each employed worker produces y (in the market), and each unemployed worker z (home production). Derive an equation showing how the socially optimal level of labour market tightness is determined. (Maximum 7 points)

Question 3 (maximum 25 points)

In the course we have analysed a number of bargaining models:

   • collective bargaining about the wage only (the right-to-manage model)
   • weakly efficient bargaining
   • strongly efficient bargaining
   • collective bargaining about the wage and working time
   • bargaining between firms and individual employees about the wage in the matching model.

Discuss the pros and cons of the various wage-setting models. Under what circumstances are the various models relevant and applicable?

Question 4 (**maximum 25 points**)

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

This question is about the standard labour supply model.

  (a) Formulate the decision problem of an individual who derives utility from consumption and leisure. Derive the first-order condition for utility maximisation (assuming an interior solution). (Maximum 4 points)
  (b) Show mathematically what is the effect on labour supply (leisure) of an increase in other incomes (than those from labour). (Maximum 6 points)
  (c) Show mathematically what is the effect on labour supply (leisure) of an increase in the wage. Decompose the effect into a substitution effect, an indirect income effect and a direct income effect. (Maximum 6 points)
  (d) Illustrate the answers in (b) and (c) diagrammatically. When doing this derive formally the budget line and show what happens to it when other incomes and the wage increase. (Maximum 4 points)
  (e) For there to be an interior solution where an individual chooses to supply labour, the wage must exceed the reservation wage. What is the individual's reservation wage in this model? Illustrate diagrammatically. (Maximum 5 points)