This exam has 4 questions, with 12 sub-questions. Each sub-question counts equally. When answering the questions on the exam you should be brief and to the point! Make sure to write clearly. Difficult to decipher answers will not be counted!

1. In this question you have to indicate whether you think the statement is true or false and explain why. You do not get any points if you only state whether the statement is true or false.

   (a) If the price of an input factor j rises, the demand curve for a complementary input factor i shifts down.

   (b) Sequential job search theory predicts that a lower cost of job search reduces unemployment duration.

   (c) A profit maximizing firm chooses an optimal input mix of labor and capital at given prices. If the firm minimized costs, then it would choose the same input mix as under profit maximization, if the optimal level of output is produced.

   (d) Suppose workers' productivities across sectors are perfectly positively correlated. In this case, the Roy model predicts that all workers will tend to work in the sector in which they are most productive.

2. Incentive Pay.

   (a) Explain the trade-off between incentives and insurance in a principal-agent model with risk averse agents.

   (b) The Shapiro and Stiglitz (1984) model says that equilibrium unemployment is a worker disciplining device. Explain the role of efficiency wages in this model.

3. This question is about: Fehr, E. and L. Goette. (2007). Do Workers Work More if Wages are High? Evidence from a Randomized Field Experiment. *American*

Economic Review 97(1): 298-317. The authors conducted a randomized field experiment at a bicycle messenger service in Zurich, Switzerland. They randomly assigned bicycle messengers working at a company called Veloblitz, who were willing to participate in the experiment, to two groups. For group A, they implemented a 25-percent increase in the commission rate during the four weeks in September 2000. The messengers in group B were paid their normal commission rate during this time period. During the four weeks in November 2000, group B received a 25-percent increase in the commission rate, while the members of group A received their normal commission rate. Table 1 shows the main results from this paper. To explain their findings, the authors consider the equation:

$$\max v(e_t) = \lambda w_t e_t - g(e_t), \tag{1}$$

where λ is the lifetime marginal utility of income, wage w_t and labor supply e_t.

Table 1. Results from Fehr and Goette (2007)

Part A

-Main Experimental Results
(*OLS regressions*)

	Dependent variable: Shifts per four-week period		
	(4)	(5)	(6)
Observations are restricted to	Messengers participating in experiment	All messengers at Veloblitz	All messengers at Flash and Veloblitz
Treatment dummy	3.99***	4.08***	3.44**
	(1.030)	(0.942)	(1.610)
Dummy for nontreated at Veloblitz			−0.772
			(1.520)
Treatment period 1	−1.28	−1.57	−0.74
	(1.720)	(1.210)	(0.996)
Treatment period 2	−2.56	−2.63**	−2.19**
	(1.860)	(1.260)	(1.090)
Individual fixed effects	Yes	Yes	Yes
R squared	0.694	0.74	0.695
N	124	190	386

Note: Robust standard errors, adjusted for clustering on messengers, are in parentheses.
*** Indicates significance at the 1-percent level.
** Indicates significance at the 5-percent level.
* Indicates significance at the 10-percent level.
Source: Own calculations.

Part B

The Impact of the Experiment on Log Revenues per Day
(Dependent variable: log (revenues per shift) during fixed shifts, OLS regressions)

	(1)	(2)
Treatment dummy	−0.0642**	−0.0601**
	(0.030)	(0.030)
Gender (female = 1)	−0.0545	
	(0.052)	
Log(tenure)	0.105***	0.015
	(0.016)	(0.062)
Day fixed effects	Yes	Yes
Individual fixed effects	No	Yes
R-Squared	0.149	0.258
N	1,137	1,137

Note: Robust standard errors, adjusted for clustering on messengers, are in parentheses.
*** Indicates significance at the 1-percent level.
** Indicates significance at the 5-percent level.
* Indicates significance at the 10-percent level.
Source: Own calculations.

(a) Interpret equation (1) and briefly explain how this static equation relates to the neoclassical model of intertemporal labor supply.

(b) Interpret the result in Part A of Table 1, column (4), row (1), which shows a point estimate of 3.99. Is this result consistent with the predictions from equation (1)? Explain why or why not.

(c) Interpret the result in Part B of Table 1, column (2), row (1), which shows a

point estimate of -0.0601. Is this result consistent with the predictions from equation (1)? Explain why or why not.

(d) The authors also consider a model with reference dependent utility:

$$\max v(e_t) = \begin{cases} \lambda\left(w_t e_t - \tilde{y}\right) - g(e_t) & \text{if } w_t e_t \geq \tilde{y} \\ \gamma\lambda\left(w_t e_t - \tilde{y}\right) - g(e_t) & \text{if } w_t e_t < \tilde{y} \end{cases}, \tag{2}$$

where $\tilde{y}$ is an income target. Interpret equation (2) and discuss whether the result in Part B of Table 1, column (2), row (1), consistent with the predictions from equation (2)?

4. This question is about: Staiger, D.O., J. Spetz, and C.S. Phibbs (2010). Is There Monopsony in the Labor Market? Evidence from a Natural Experiment. *Journal of Labor Economics* 28(2): 211-236. The authors consider the Salop model of competition around a circle, where the labor supply facing hospital i is as follows:

$$L_i = \alpha + \frac{1}{\tau}\left(w_i - \frac{w_{i-1} + w_{i+1}}{2}\right), i = 1, ..., N, \tag{3}$$

where w_i is the wage at hospital i, and w_{i-1} and w_{i+1} are wages at the two closest neighboring hospital.

(a) Suppose that the hospital sets wages to maximize profits $R(L_i) - L_i w_i$ subject to (3), where $R(L_i)$ is the revenue function and $R'_L > 0$. Derive hospital i's first-order condition and interpret the expression.

(b) Suppose $R(L_i) = L\beta$. A key parameter of this model is the per-unit travel cost τ. Imagine that the travel cost increases, i.e., there is a higher τ. How does this change monopsony power?