

Test 1
Economics 136 – Human Resources
Spring 2001
Prof. Julian Betts

April 19, 2001

Name: _____

Student ID _____

There are 3 written problems in this exam, worth a total of 50 points. Please write neatly. If you place the answer to a question in an odd place, such as the back of the page, please indicate this clearly, for the sake of the graders.

If you use pencil, the exam cannot be regraded. If you do submit your test for regrading, you must do so within 5 days of the day the test is handed back. Also, the graders reserve the right to regrade the entire test.

SHOW ALL YOUR WORK!

You have 80 minutes. Good luck.

1. (16 points) Your company wants to hire young workers, whom it expects will stay at the company for an average of 10 years. The goal of your firm is to maximize total expected profit over 10 years, with an interest rate of 0%. Consider the following statement:

“Suppose that your firm receives two job applicants, both of whom have the same expected output of Q units per year where $Q > 0$. In case A the person is certain to produce this amount, while in case B the person has a 50%-50% chance of producing 0 or $2Q$ units per year. You cannot tell which type, A or B, the person is before you hire him or her. In either case you must pay the prevailing wage rate of $0.9Q$ per year.”

Assume that if you hire a worker of type B, then at the end of 1 year you can detect whether s/he is producing 0 or $2Q$ units per year.

a) *If you cannot fire workers at the end of year 1, does your firm strictly prefer one type of worker, A or B, over the other? Explain your reasoning. (8 points)*

b) Now assume that you can fire workers at the end of year 1. Which type of worker do you prefer to hire now? Explain. (8 points)

2. (14 points)

a) Explain the logic behind the statement: "Firms that pay piece rates generally attract higher quality workers than those that pay straight salaries, but the firms that pay piece rates pay higher average wages." (10 points)

b) Continuing the above question, suppose that your firm offers piece rates. You will have to hire supervisors to monitor the output of each worker. Assume that workers are equally productive at your firm and others, and that other firms can figure out the results of the monitoring that you do. In this situation, does your firm have to pass on the costs of monitoring the new workers by reducing their earnings in period 1? Explain why or why not. (4 points)

3. (20 points) Suppose that your firm, Yogurt.com, wants to hire only skilled workers, but it cannot detect a worker's skills until after the first period of employment. Workers can work for you at most two periods before retiring. The President of the company asks you to design a probation program at the firm under which new hires earn a wage W_1 in period 1, and if they are not fired at the end of period 1 they earn W_2 in period 2. She asks you to design the program so that no unskilled worker would ever apply for the job, but skilled workers would apply. Assume that the interest rate is zero.

In the general labor market, skilled and unskilled workers earn $W_S = \$16$ and $W_U = \$10$ respectively.

Because making yogurt is such an art, *at the end of period 1 a proportion P of unskilled workers will be incorrectly identified as skilled workers, even though all skilled workers will be correctly identified.*

a) Write down an equality that determines W_1 as a function of W_2 , under the assumption that only skilled workers apply and that your firm minimizes costs. This equation should be valid for any value of P . Show your reasoning. (4 points)

b) Suppose that $P=0$, i.e. that you can detect ALL unskilled workers after the first period. Derive inequalities that define W_1 and W_2 that ensure that all unskilled workers will **strictly prefer** not to apply to your firm, while ensuring that skilled workers will apply. (Hint: the inequalities should be of the form $W_1 > ?$ or $W_1 < ?$, $W_2 > ?$ or $W_2 < ?$.) Show your work (6 points)

c) Now suppose that it becomes easier for unskilled workers to masquerade as skilled workers, due to a new publication “Yogurt for Dummies”. **So P rises to $P=0.4$.** Derive two inequalities that define W_1 and W_2 that ensure that all unskilled workers will **strictly prefer** not to apply to your firm, while ensuring that skilled workers will apply. Show your work. Explain in a sentence or two the intuition for why you obtained different answers here than in part b. (10 points)