

Test 1
Economics 136 – Human Resources
Spring 2000
Prof. Julian Betts

Name: _____

Student ID _____

There are 3 written problems in this exam, worth a total of 85 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 marker.

If you use pencil, the exam cannot be regraded.

SHOW ALL YOUR WORK!

You have until 10:55. Good luck.

1. (25 points) Suppose that there are two types of workers, skilled and unskilled, with productivities of \$2 and \$4 per period. (These numbers equal productivity of the two types of workers at both your firm and other firms.) Each worker will work for your firm for 1 or 2 periods. You learn the worker's productivity at the end of period 1. Each worker makes up 50% of the population.

a) Your Vice President Finance suggests offering an average salary of \$3 per period, on the logic that average productivity of workers in the population is \$3. Who will the firm end up hiring in period 1? What are the profits that will result? Should you support your Vice President's suggestion? (15 points)

b) Outline how you might set up a probationary period in order to obtain only the more productive workers. Be specific and explain how it works. (10 points)

2. (35 points) You must decide whether to hire another secretary, whose output is easily measured, or merely to install Voice Processor (VP), which is a new and extremely reliable voice recognition program, and employ existing secretaries. A secretary costs \$800 per month and VP, which can only be rented, costs \$500 per month. VP yields 6000 pages of output per year.

The firm is planning to stay in business for only 12 more months. This applies to both questions a) and b).

a) If a new secretary produces twice as much output (correctly typed pages) as VP, should the firm hire the secretary or rent Voice Processor? (15 points)

b) Now suppose that half of the secretaries are twice as productive as VP, but the other half are only equally productive. Suppose that the firm can determine worker productivity only at the end of 9 months. At that time, it can fire unproductive workers. Will the firm prefer to hire a secretary instead of renting VP?

Hint: What is the expected cost and output per year from hiring a secretary and from renting VP? (20 points)

3. (25 points) Suppose that the labor force in your region consists of one-third each of workers with productivity of \$3, \$6, and \$9 per hour. There are two types of firms, those that offer a fixed salary of \$4.50 per hour and those that pay a piece rate. Because it is costly to monitor output, these latter firms deduct \$2 per hour for the costs of monitoring. Thus, workers of the three types can earn the following per hour:

Worker type (productivity per hour)	Piece rate (output-\$2)/hour	Fixed salary per hour
\$3	\$1	\$4.50
\$6	\$4	\$4.50
\$9	\$7	\$4.50

a) Which workers will work at the fixed salary firms? Which will work at the piece rate firms? (10 points)

b) Ignoring monitoring costs, at which firms are workers more productive on average? Explain. (6 points)

c) Calculate the profit per hour per worker for the two types of firms. (6 points)

d) Is there an incentive for fixed-salary firms to switch to piece rates, or for piece-rate firms to switch to fixed salaries? (3 points)