FINAL Exam: Economics 463, Labor Economics
Spring 2005 in R. Butler's class

YOUR NAME:_____

Section I (60 points) Questions 1-20 (3 points each)

Section II (20 points) Questions 21-24 (5 points each)

Section III (120 points) Questions 25-30 (20 points each)

Section I. Define or explain the following terms (3 points each)

1. Mincer earnings function--

2. reservation wage--

3. added worker effect--

4. Mathusian model of fertitlity--

5. perfect complements in production--

6. nonpecuniary benefits--

7. Roy model of selection (in education)--

8. scale effect--

9. cobweb model--

10. fixed money costs of work (effect on the budget) -

11. Lorenz curve-

12. comparable worth--

13. indifference curves when utility=U(C+mL) [C=consumption, L=leisure and m is a constant)—

14. homothetic production function—

15. positive vs. normative economics--

16. wage determination with non-discriminating monopsony—

17. Coase theorem—

18. structural vs. frictional unemployment—

19. deadweight loss of a payroll tax--

20. common law defenses (before workers compensation laws)--

Section II. Part one: True, False, or Uncertain (sometimes true). You are graded on your explanation

21. “If the elasticity of substitution is larger, or the product demand more negative (more elastic), then the easier it will be a union to pass for higher wages without reducing the employment of its members.”

22. “Because job interventions are easily measured, and outcomes such as subsequent wages and employment, it is not necessary to use experimental methods to evaluate job training programs.”

23. Suppose that years of schooling, s, is thought to be the only variable that affects earnings. The equations for the weekly salaries of male and female workers are given by

$w_m = 500 + 100\, s_m$ for males, and

$w_f = 300 + 75\, s_f$ for females.

On average, males have 14 years of schooling and females have 12 years of schooling.

a. How big is the male-female differential in the labor market?

b. Using the Oaxaca decomposition, calculate how much of the wage differential is due to discrimination?

c. Suppose that their were also hierarchical discrimination in the sense that males didn't like being supervised by females. How might this change the specifications of the model (variables in the model and/or specification), and would the Oaxaca decomposition still be a useful method to measure discrimination? Why or why not?

24. Suppose that we live in a signaling world, with two types of individuals. Blue types have inherent marginal products of 2, and red types have inherent marginal products of 1 (they are blue and red only on the "inside," employers cannot tell them apart). 50 percent of the workers are blue types. The cost of acquiring "E" years of schooling is E for blues, and 3E for the reds. What is the equilibrium level of schooling sufficient to sort out the reds from the blues? How does each group fare relative to a world in which there was no signaling?

Section III. Bigger Questions

25. The compensating wage problem in the market for risky jobs. SUPPLY: Assume that the compensating variation for risk (Z, just as in class) varies across workers following a uniform distribution:

$$G(\Delta W) = \Delta W/\varphi \quad \text{where } \Delta W \blacktriangleright \varphi$$

giving the fraction of workers choosing risky jobs (N_1) as a function of the compensating wage differential, ΔW. The compensating differential ΔW becomes a rent if it is larger than that required (namely Z) to induce them to work.

DEMAND: To keep the analysis simple, we also assume that the Benefit from allowing risk (B) is also uniformly distributed so that

$$3)\ F(\Delta W) = \Delta W/\alpha \quad \text{where } \Delta W \blacktriangleright \alpha$$

is the number of firms for whom B is less than the compensating wage ΔW so that it is cheaper (in terms of lost output) to have a safe production environment than it is to pay the extra wages associated with risky work.

a) Show that supply curves slope upward and demand curves slope downward (where the relative employment of risky to safe workers (N_1/N_0) is a function of the wage differential, ΔW).

b) Find the (at least the implicit) equilibrium wage differential, ΔW.

c) What happens to the relative number of risky workers and the compensating wage when risk aversion increases (i.e., φ increases)?

26. a. Derive the efficiency wage as given in class and chapter 12, where effort is an increasing function of wage.

b. Using the no-shirking supply curve given in chapter 13 of Borjas (the last chapter assigned in the book), describe the relative wage changes in efficiency wage firms vs. no-efficiency wage firms in the presence of an economic contraction.

27. Indicate whether the following statement is True, False, or Uncertain. Explain why. You are graded only for your explanation: "Jack's wage is $20/hour, while his wife Jill makes $15/hour. In home production, Jack makes $10 worth of output for each hour he spends in home production; Jill makes $25 worth of output for each hour she spends in home production. Suppose Jack and Jill each have the same total hours available for home and market production (they sleep the same number of hours). If their combined preferences for market goods and home goods is as follows:

utility=min(MG, HG)
where MG=market goods, and HG=home goods,

then Jack will completely specialize in market goods while Jill will completely specialize in home goods."

28. Suppose there are 100 workers in the economy with two firms. All workers are worth $40 to firm A but differ in their productivity at firm B. Worker 1 has a value of marginal product of $1 to firm B; worker 1 has a value of marginal product of $1 to firm B: worker 1 has a value of marginal product of $1 to firm B, etc. Firm A pays its workers a time rate of $35 per hour, while firm B pays a piece rate. (Note that there is no uncertainty in output, hence, no uncertainty in pay for individual i in either firm A or B).

a) How will the workers sort themselves across firms?

b) Suppose that a decrease in demand for both firms' output reduces the value of every worker to either firm by half. How will workers now sort themselves across the two firms?

29. Ms. U'Vsc is a psychic. The demand for her services is given by Q=2,000-10P, where Q is the number of one-hour sessions per year and P is the price of each session. Ms. U'Vsc's operation has no fixed cost, but she incurs a cost of $150 per session (such as the expense incurred in going to the client's house).
a) What is Ms. U'Vsc's yearly profit?
b) Suppose that Ms. U'Vsc becomes famous after appearing on the Psychic Network. The new demand for her services is now Q=2,500 – 5P. What is her profit now?
c) Adances in information technology revolutionize the way that Ms. U'Vsc does business. She begins to use the Internet to find all relevant information about clients and meets many clients through teleconferencing. The new technology introduces an annual fixed cost of $1,000, but the marginal cost is only $20 per session. What is Ms. U'Vsc's profit now? (Assume the demand curve is still given by Q=2,500 – 5P.)
d) Summarize the lesson of this problem for the superstar phenomenon.

30. Suppose that they are two senior VPs competing for the CEO position, person 1 and person 2, each of whom maximizes the expected value of competing against the other for the CEO spot less the disutility of competing (given as $G(E_1)$). Wage w_1 is paid to the winner, and wage w_2 is paid to the loser of this tournament. Suppose that the probability that person 1 is the winner is function of his effort, E_1, relative to the effort by person 2, E_2, as follows:

$$P_1 = \frac{E_1}{E_1 + E_2} \qquad for\ 0 \le \frac{E_1}{E_1 + E_2} \le 1.$$

The disutility of competing increases in the amount of own effort as follows:

$$G(E_1) = E_1^2.$$

Suppose person's two optimization problem is symmetric.
1) Derive the optimal response of person 1 in this tournament.

2) Show what will happen to person's one effort as the spread in earnings, $w_1 - w_2$, increases.