

Do **Four** questions. Time allowed: 2 hours.

IMPORTANT: *Explain* your answers carefully. The right diagram is usually more effective than a lot of words (but you must explain what the diagram means). You get no credit for unsupported assertions or guesses. Write as if you are trying to convince an intelligent person who does not already know the answers. If your answers would not convince such a person, it will be assumed that you do not really understand the material.

1. A monopolist faces the demand curve

$$P = 120 - 2Q$$

where Q is the annual quantity sold, and P is measured in dollars. Labor is the only input, and the labor supply curve is perfectly elastic at a wage of \$2/hr. Using L to represent total hours worked, the production function is

$$Q = \sqrt{2L - 200}$$

- a. Find the profit-maximizing price and quantity.
 - b. Suppose a union imposes a wage of \$4/hour. How many workers will lose their jobs? What will happen to total labor income?
2. Pick **TWO** of the following assertions. Say whether they are true, false or uncertain, and explain why.
- a. "If the prices of all consumer goods increase by 10%, while wages stay constant, the quantity of labor supplied will increase if the income effect is bigger than the substitution effect.
 - b. "Discrimination cannot survive in competitive markets."
 - c. "If all workers were identical in every respect, the equilibrium wage would be the same in every job."
3. The internal rate of return on a college degree is above 10%, according to some estimates. Yet there are theoretical arguments suggesting that this could be true even if a college education does not increase a worker's productivity. Explain this.
4. Consider a primitive economy with two kinds of jobs, dragon slaying and cave decorating. Suppose the marginal product of slayers is $s=600-S$, where S is the number of slayers in the economy, and s is the value of their marginal product, in dollars. The marginal product of decorators is given by the equation $c=600-C$, where C is the number of decorators in the economy, and c is the value of their marginal product. There are 630 workers in the economy, all equally productive in decorating and slaying. All workers prefer decorating to slaying.
- a. Suppose all workers agree that a difference of \$30 is just enough to offset their preference for decorating. If the economy is competitively organized, how many people will be cave decorators, and how many will be slayers? What will the wage differential be, in equilibrium?
 - b. Now suppose that preferences differ across individuals: the distribution of equalizing differences ranges evenly from 0 to \$63. For example, if $s-c=\$3$, 30 people (3/63 of the total) choose slaying. How will this change the equilibrium?
5. A worker is searching for a job that will last a month (no matter how long it takes to find it). Each week, the worker receives exactly one job offer, and the cost of job search for a week is \$360. The best possible job pays \$4,000, the worst pays \$2,000, and any wage between these extremes is equally likely (e.g. there is a 60% chance that any given job pays at least \$2,800).
What search strategy would maximize the expected wage, net of search costs?
6. Suppose a union and an employer start to negotiate on Monday over wages to be paid for the week (Monday-Friday). No work will be done until they reach an agreement. The employer's net revenue, after paying all costs other than wages (including a normal return on capital), is \$400 per worker per day. While negotiations continue workers can collect \$26 per day in unemployment benefits (this is a straight subsidy that does not have to be repaid).
The negotiations proceed as follows. Each morning, the employer and the union meet, and one side proposes a wage for the day. If this proposal is accepted work begins immediately. If not, the workers collect unemployment benefits for the day, and nothing happens for the rest of the day; tomorrow there is a new meeting and a new proposal.
At the Monday meeting a coin is tossed to determine which side makes the proposal for that day. Whichever side wins the coin toss can choose whether to make an offer that day, or to receive an offer from the other side and make an offer on Tuesday. In subsequent meetings they take turns: first one side makes a proposal, then the next day the other side makes a proposal, and so on.
- a. How long will these negotiations take? What wage agreement will be reached?
 - b. If the union wins the coin toss on Monday, will they choose to make the first offer?