DIRECTIONS: There are 18 short-answer questions (3 points each) on this exam followed by 6 essay questions (total of 55 points). The answers to the first 18 questions should be placed on the answer sheet attached to the end of the exam. No credit will be given to answers placed elsewhere. The answers to the essays should be provided in the space below each essay question. Be sure you read the question carefully and answer only what you are asked. You will not have time to answer more than the question asks.

To answer the next 6 questions, refer to the diagram drawn below. The indifference curves for workers A and B are given by A0, A1 and B0, B1. The iso-profit curves for firms X and Y are given by X1 and Y1.

1. At the point O in the above diagram, firm _____ (X or Y) is willing to pay the bigger wage premium to get workers to accept more risk.

2. At the point P in the above diagram, _____ (A or B) workers require a larger increase in wages for an increase in job risk.

3. Comparing points O and P, A workers would be happier at point ____ and B workers would be happier at point ____.

4. Comparing points O and P, X firms would have higher profits at point _____ and Y firms would have higher profits at point _____.

5. Given the above diagram, the equilibrium sorting is going to match A workers with ______ (X or Y) firms and B workers with ______ (X or Y) firms.

6. Given the above diagram, the equilibrium sorting is going to result in A workers receiving (higher, lower) wages than B workers and (higher, lower) risk than B workers.
To answer the next 2 questions, suppose that there are two types of nursing jobs: day jobs and night jobs. Day jobs pay $25 per hour. The labor supply for night jobs is given by the diagram below:

7. Based on the diagram above, what is the compensating wage differential for working a night job as compared to a day job?

8. Based on the diagram above, what are the total "rents" received by the nurses on the night shift? (Give a dollar value.)

To answer the next 3 questions, consider the following information. Fred could get a job at $25,000 per year with only a high school degree. If he goes to college, he would pay $8000 tuition per year (for 4 years), but would earn $32,000 per year after he graduates. His wage would not grow over time under either scenario. Under either scenario, he will retire at age 65 (thus work 47 years if start after high school, 43 years if start after college).

9. If the interest rate is zero, what is the net present value of the investment in a college education?

10. If the interest rate is 6%, the present value of $1 per year for 4 years is $3.50 and the present value of $1 per year for 43 years is $12.12 if the first payment starts in 4 years. Use this information to calculate the net present value of the investment in college education if the interest rate is 6%. Give your answer in dollars (be sure to indicate positive or negative!)

11. Given the answers provided above, the internal rate of return on the college education is
   a. less than 0%
   b. between 0 and 6%
   c. greater than 6.
12. As workers' moving costs increase, their labor supply curve for their current employer will generally become more
   a. elastic  b. inelastic.

13. The marginal expense of additional labor is higher if labor supply is more
   a. elastic  b. inelastic

14. If a monopsonist is able to sort workers into groups with elastic and inelastic labor supply, she will be able to realize lower labor costs if she pays lower wages to the group with
   a. elastic labor supply  b. inelastic labor supply.

15. In a cross-sectional study of immigrant earnings that compares young with old workers to estimate how rapidly earnings rise with age, an improvement in the "quality" of immigrants over time would lead to an estimate of earnings growth that is _____ than what immigrants actually realize.
   a. higher  b. lower

To answer the next 3 questions, refer to the information below: Consider the following estimated wage equations for men:

\[ W = 2.0 + 0.6 \text{Education} + 0.4 \text{Experience} \]

The average levels of education and experience are as follows:

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<td>Women</td>
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Suppose the average wage for men is $16.80 and the average wage for women is $12.00.

16. What portion of the $4.80 wage gap can be attributed to differences in education?
17. What portion of the $4.80 wage gap can be attributed to differences in experience?
18. How much lower are women’s wages than men’s because of “discrimination”?
1. (8 points) Suppose that you manage an apple orchard and currently pay apple-pickers $8 per hour. You are considering switching to a piece rate system and pay apple-pickers by the number of bushels picked. Having noted that the typical picker harvested one bushel per hour when you paid by the hour, you decide to pay $8 per bushel. A competing orchard down the road continues paying $8 per hour.

   a. If you switch to a piece rate, which workers are most likely to quit and switch to your competitor? Which are most likely to leave your competitor and join your orchard? Explain briefly.

   The workers that are most likely to quit are slower workers who would pick less than 1 bushel per hour under the piece rate since they will earn more at your competitor than under the new piece rate. The workers that are most likely to switch from your competitor to you are those who would pick more than 1 bushel per hour under the piece rate since this is above what your competitor pays.

   b. List two distinct problems that you are likely to encounter with this piece rate system.

   There are several potential problems:
   1. Reduced incentive for cooperation among workers that might hurt their individual productivity.
   2. Potential for increased abuse of equipment in an attempt to increase productivity (e.g. throwing baskets, dropping ladders in a hurry, etc.)
   3. The “quality” of apple picking might fall. For example, workers may avoid the “hard to get” apples in order to maximize productivity, or they may be less careful with the apples and bruise them.
   4. Workers may become upset with pay when there is a crop that is more difficult to harvest. For example, in a year when the trees are less full, productivity may drop despite the fact the workers are putting in equal effort.

2. (6 points) In class, we discussed the fact that most of the executives in corporations are paid primarily in the form of stocks or stock options, but argued that it might make sense to pay them on a "relative" performance standard instead.

   a. What was the major shortcoming of paying a CEO in the form of stock options that we discussed in class?

   The major shortcoming of paying a CEO in the form of stock options is that they may be rewarded (or penalized) for changes in firm performance that they had absolutely nothing to do with. For example, if interest rates fall and stock prices rise, the CEO benefits. Alternatively, if there is an increase in the cost of vital inputs to the company (perhaps due to an oil price shock), the stock price falls and the CEO is penalized for something they had nothing to do with.

   b. If a corporation that sells insurance wants to pay its CEO on a "relative" basis, what could the pay be based on? Be precise.

   To pay an insurance company CEO on a relative basis, the CEO should be paid on the basis of how her company’s stock performs relative to an index of other insurance company stocks. With this relative form of pay, the CEO would benefit if the company outperforms other insurance companies, but would not be penalized or rewarded for shocks that impact the entire industry and have nothing to do with how the CEO managed the company.
3. (12 points) Suppose that you own a day-care service and employ several workers. One concern that you have is that you occasionally catch employees "shirking" and not paying sufficient attention to the children.

a. Explain why the payment of an "efficiency wage premium" might reduce this problem. Be sure to define what you mean by an efficiency wage premium.

When an employer pays an efficiency wage premium, he is paying the worker a wage that exceeds the worker's next best alternative. With such a premium, a worker is more concerned about losing his job because it means they will have to go somewhere else and earn less. Consequently, they will be less likely to shirk since shirking increases the chance of losing the job.

b. Describe a worker characteristic that would make a person less responsive (in terms of shirking) to an efficiency wage premium. Be sure to indicate why it would make them less responsive.

If a worker does not intend to be with the firm for long (perhaps anticipating retirement or leaving the employer for some other reason), the present value of the stream of efficiency wage premiums is reduced. Consequently, workers who expect to be with a firm for a relatively short period of time will be less responsive to an efficiency wage premium.

c. Explain why "deferred pay" could help reduce shirking and define what you mean by deferred pay.

Deferred pay is when a worker is paid less than their marginal revenue product early in their career but paid more than their MRP late in the career. Over the entire career, the present value of compensation is identical to what they could receive elsewhere. Deferred pay could help reduce shirking because workers with such contracts have more to lose if they are caught shirking and are fired. Namely, if a worker with deferred pay is fired for shirking, she will not receive the "overpayment" that she was promised in exchange for the "underpayment" early in her career.

d. Give two distinct reasons that an employee would be reluctant to accept a job with deferred pay.

There are several potential reasons:
1. The worker may plan on staying with the firm for only a short period of time and thus would never receive the overpayment promised at the end of the career.
2. The worker may not trust the firm to live up to the promise of the deferred pay.
3. The worker may be concerned that the firm could go bankrupt.
4. The worker may have a high discount rate and be unwilling to exchange current pay for future pay at the interest rate that the firm is implicitly offering.
4. (12 points) To answer the questions on this page, refer to the diagram below illustrating an isocost (X0) and iso-shirk curve (I0) for a firm.

![Diagram of iso-cost and iso-shirk curves]

a. Why does the iso-shirk curve slope down?

*The iso-shirk curve represents various combinations of p and q that yield the same level of shirking. Since the expected loss from shirking is \( p \cdot q \cdot L \) where \( L \) represents the expected length of the job (assuming zero interest rate), any combination of \( p \) and \( q \) that yields the same expected loss will generate the same level of shirking. Consequently, an iso-shirking curve is given by combinations of \( (p, q) \) where \( p \cdot q \cdot L = \text{constant} \). With this equation, any increase in \( q \) must be offset by a decrease in \( p \).*

b. Why does the iso-cost curve slope down?

*The iso-cost curve represents various combinations of \( p \) and \( q \) that cost the firm the same amount. An increase in \( p \) costs the firm more in terms of wages. An increase in \( q \) costs the firm more in terms of dollars spent on monitoring. Consequently, for costs to remain constant, any increase in \( p \) (wages) must be offset by a decrease in \( q \) (monitoring costs).*

c. Would the firm be better off at the point B or C? Carefully explain why.

*The firm would be better off at C. Although B and C represent the same level of cost (they’re on the same iso-cost curve), C is on an iso-shirk curve further to the NW which implies that there will be less shirking.*

d. Suppose that a new technology makes monitoring became less expensive and the firm was currently at point C. On top of the diagram above, draw a new iso-cost curve for the firm reflecting this change and describe how and why it would affect the size of the efficiency wage premium paid to workers.

*A reduction in monitoring costs would make the iso-cost curve steeper because any decrease in the efficiency wage premium (\( p \)) could be used to achieve a larger increase in the probability of detecting cheating (\( q \)). The dashed iso-cost curve represents the effects of this new technology. Moreover, with the new iso-cost curve, the firm can move to the NW along the curve to achieve even lower levels of shirking without any increase in cost relative to point C. That is, it will substitute increased monitoring for reductions in the efficiency wage premium.*
5. (8 points) We discussed several types of wage discrimination in class.
   a. Describe one type of discrimination that should be driven out by "competition" among firms. Explain how competition would eliminate the discrimination.

   Employer wage discrimination should be driven out by competition. When an employer discriminates against a minority group, it will pay a wage premium to avoid hiring minority workers. Payment of such a wage premium reduces their profits relative to the nondiscriminating firm that hires only minority workers. Eventually, the nondiscriminating firm will be able to drive the discriminating firm out of business since they have lower costs.

b. List two types of discrimination that would improve a firm's profits. No explanation of how it improves profits is necessary.

   2. Statistical discrimination.

6. (9 points) In class, we discussed a federal tax law that could help explain why the amount of fringe benefits that a worker receives from her employer is greater if her coworkers are high income workers than if they are low income workers.
   a. Briefly describe the tax law that's being referred to.

   Non-discrimination laws require that an employer provide “highly compensated” and “non-highly compensated” workers fairly similar fringe benefit packages.

b. Explain why this law leads to the result described. No graphs are necessary

   Because income tax rates rise with income and many fringe benefits are not taxed, higher income workers receive a greater tax advantage from fringe benefits and prefer a larger share of their compensation in the form of fringes. If a firm must provide the same level of fringes to everyone, they will be forced to offer a “non-optimal” package to many workers that lies between what would be optimal for high and low income workers. The more high income workers there are, however, the closer the package would be to the optimal package for high income workers.

c. Explain how and why this law would affect a firm's decision to "contract out" for certain types of services. No graphs are necessary.

   Because non-discrimination laws force a firm to offer everyone the same fringe benefit package, firms are forced to a point where low income workers would be willing to give up more than $1 of fringe benefits for an extra $1 of wages and high income workers would be willing to give up more than $1 of wages for an extra $1 of fringe benefits. If there are relatively few low income workers, it may make sense to contract out their services so that another company can offer a package that is optimal for low income workers and you can offer what’s optimal for your high income workers. A similar argument could be made for contracting out high skill jobs if you employ only a few high income workers.
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