ECO361: LABOR ECONOMICS
FIRST MIDTERM EXAMINATION
OCTOBER 7, 2008

Prof. Bill Even

DIRECTIONS.

The exam contains a mix of short answer and essay questions. Your answers to the 24 short answer portion of the exam (3 points each) should be listed on the answer sheet attached to the end of the exam. No credit will be given for answers placed elsewhere. Your answers to the essays (36 points total) should be provided in the blue book provided.

You have until 1:50 to complete the exam. If you wish to purchase additional time, you may do so at a price of 5 percentage points per minute. When you complete the exam, place your answer sheet inside of the bluebook. You may keep your copy of the exam.
Consider the data below for August 2008 to answer the 4 questions that follow.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number (in 1000s)</th>
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</thead>
<tbody>
<tr>
<td>Employed Civilians</td>
<td>146,070</td>
</tr>
<tr>
<td>Unemployed Civilians</td>
<td>7,591</td>
</tr>
<tr>
<td>Civlian Noninstitutionalized population</td>
<td>234,107</td>
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</tbody>
</table>

Based on the data provided, provide numerical estimates of each of the following (round your answers to 1 & 2 to the nearest 0.01 percent, e.g. 7.32%).

1. the unemployment rate
2. the labor force participation rate
3. the labor force

4. Given the above information, suppose that 2 million people who were out of the labor force begin looking for work and 1.6 million of these workers immediately find jobs. The effect of this change would be that the unemployment rate would _____ and the labor force participation rate would _____.
   a. rise; rise.   b. rise; not change.   c. not change; rise;   d. fall; rise.

To answer the next 2 questions, consider the following information. Between 1/2006 and 1/2008, the CPI rose from 198.3 to 221.1. The base year for the CPI is 1983.

5. If the nominal wage in 1/2006 is $10 per hour, what would the nominal wage have to be in 1/2008 in order that the real wage be unchanged over the period? (Give your answer to the nearest penny.)

6. A nominal wage of $10 per hour in 1/2008 would have the same purchasing power as a nominal wage of $______ in 1983 (give your answer to nearest penny).
To answer the next 3 questions, suppose that the daily output of a company that replaces car windshields is given by the table below:

<table>
<thead>
<tr>
<th>Labor</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>13</td>
</tr>
</tbody>
</table>

Assume that the firm receives $150 for each windshield installation and a worker earns $200 per day.

7. If the firm increases the number of workers from 2 to 3, it’s profits would *(increase, decrease)* by $_______.

8. What is the *marginal product* of the second worker?

9. What is the *marginal revenue product* of the second worker?

10. What is the profit maximizing number of workers?
Suppose that a firm is pays $250 for a unit of capital per day, and $100 for a worker per day. Further, suppose that the MP of labor is 2 units of output. If the firm is maximizing profits,

11. What is the marginal product of capital?
12. What is the price of a unit of output?

13. Suppose that a firm pays $250 for a unit of capital per day, and $100 for a worker per day. Further, suppose that the MP of labor is 2 units of output and the MP of capital is 4 units of output. If the firm wants to keep production constant and minimize costs, it should:
   a. Use the current mix of capital and labor.
   b. Use more capital and less labor.
   c. Use more labor and less capital.

14. The corporate income tax is a tax on capital. Consequently, if McCain is elected president and is able to follow through on his promise to cut the corporate income tax, this would cause the demand for labor to:
   a. Increase regardless of whether labor and capital are gross substitutes or gross complements.
   b. Increase only if labor and capital are gross substitutes.
   c. Increase only if labor and capital are gross complements.
   d. Decrease regardless of whether labor and capital are gross substitutes or gross complements.

15. The corporate income tax is a tax on capital. Consequently, if McCain is elected president and is able to follow through on his promise to cut the corporate income tax, the substitution effect of the tax cut would be to ____ the demand for labor and the scale effect would be to ____ the demand for labor.
   a. Increase; increase.
   b. Increase; decrease.
   c. Decrease; decrease.
   d. Decrease; increase.

16. Some states now provide employers subsidies to firms who are willing to hire workers in a designated “enterprise zone”. This subsidy would have a larger positive effect on the employment in enterprise zones if the demand for labor is more (elastic, inelastic) or the supply of labor is more (elastic, inelastic) among the welfare population.
   a. elastic; elastic.
   b. elastic; inelastic.
   c. inelastic; elastic.
   d. inelastic; inelastic.

17. We discussed in class the difference between less than truckload (e.g. UPS) and truckload shipping. The discussion emphasized that unions would have greater bargaining power in the
   a. less than truckload industry because it has more inelastic product demand
   b. less than truckload industry because its capital is a better substitute for labor.
   c. truckload industry because it has more elastic product demand
   d. truckload industry because its capital is a poorer substitute for labor.

18. Which of the following conditions makes labor demand more inelastic?
   a. labor is a larger share of the total costs of production.
   b. the substitutes for labor have a more elastic supply.
   c. capital is a better substitute for labor.
   d. none of the above.
19. If the quantity of steel workers demanded falls from 4,000 to 3,000 when the equilibrium wage increases from $15.00 per hour to $16.00 per hour, the own-wage elasticity of demand for these workers is _____. (Round answer to nearest 100th -- e.g. 3.64).

20. If the demand for labor is inelastic, a 10% increase in the wage rate will cause the quantity of labor demanded to fall by (more, less) than 10% and total labor earnings would (rise, fall).
   a. more; rise.   b. more; fall.   c. less; rise.   d. less; fall.

21. Most of a payroll tax is eventually paid by
   a. employers if the supply of labor curve is very inelastic.
   b. employers if the labor demand curve is very inelastic.
   c. workers if the supply of labor curve is very elastic.
   d. workers, regardless of the elasticity of labor supply or demand.

Consider the diagram drawn below for a monopsonist to answer the two questions that follow.

22. The profit maximizing wage and number of workers for the above monopsonist is:
   a. W0 and N1  b. W1 and N2  c. W0 and N1.  d. none of the above.

23. A minimum wage set between W0 and W1 would cause the profit maximizing level of employment to
   a. rise to somewhere between N1 & N2.
   b. fall below N1
   c. rise beyond N2
   d. rise, but remain below N1.

24. Suppose that a firm pays its workers $20 per hour and buys each worker a health insurance policy at a cost of $5,000 per year. If the firm wants to continue producing the same level of output, any increase in health insurance costs should cause the firm to:
   a. use fewer workers and increase the number of hours per worker because health insurance is a variable cost.
   b. use fewer workers and increase the number of hours per worker because health insurance is a quasi-fixed cost.
   c. use more workers and decrease the number of hours per worker because health insurance is a variable cost.
   d. use more workers and decrease the number of hours per worker because health insurance is a quasi-fixed cost.
Essay Questions — Put all answers in the blue book provided.

1. (12 points)
   a. Carefully describe the difference between general and specific training.

   General training is training that increases a worker’s MP at a number of different firms, whereas specific training increases MP only at the firm that provides the training.

   b. Explain why the general or specific nature of training affects a firm’s willingness to pay for the training.

   With specific training, a worker’s post-training MP is higher at the firm that provided the training than at his/her next best alternative. Consequently, the firm that provided the training can pay the worker a wage that is above the MP at the next best alternative, but below the MP at the firm without concern for losing the worker to the competition. The fact that the firm can pay the worker less than MP after the training allows the firm to recapture funds to fund the investment in the training.

   With general training, a worker’s post-training MP is enhanced at many firms. Consequently, the firm cannot pay the worker less than MP after the training or the worker will likely leave to a competing firm and earn his entire MP. Consequently, with general training, the firm will have difficulty recouping its training investment.

   c. Explain why training investments by a firm affect its desire to “defer” (backload) worker pay.

   When a firm invests in training, they would like the worker to stay with the firm after the training is complete to maximize the returns on their investment. One way to accomplish this is to defer pay so that the worker is paid less than his best alternative early in the career, but more than the alternative late in the career. This reduces the chance that the worker will be able to locate a higher wage by leaving the firm after the training is complete.

   d. Give two reasons that a worker may be reluctant to accept employment at a firm that offers deferred pay.

   There are several possible reasons:
   
   i. Deferred pay restricts the worker’s ability to move without a wage penalty later in his/her career.
   
   ii. If the employer goes bankrupt, the worker will not receive the deferred pay and will be penalized when moving to the next best alternative.
   
   iii. The employer may not follow through on the promise of deferred pay, in which case the worker may have been better off starting with a different firm.
   
   iv. The worker may have a higher discount rate than prevails in the market place. This means that the worker places a premium on getting money sooner rather than later and will place a lower value on deferred pay, even if the deferred pay includes market rate of interest the deferral.
2. (12 points)
a. Explain how each of the following is likely to affect the elasticity of labor demand. Provide the logic behind your answer by describing how the size of the scale and/or substitution effect is altered by the characteristics mentioned.
   i. the capital intensity of the production process

   The more capital intensive the production process, the smaller will be the elasticity of labor demand. The reason is that as capital intensity rises, labor costs become a smaller fraction of total costs. Hence, when wages increase, it will have a smaller effect on the costs of production and a smaller scale effect.

   ii. the elasticity of product demand

   As product demand becomes more elastic, the greater will be the elasticity of labor demand. The reason is that as product demand becomes more elastic, the scale effect of a wage increase becomes larger because any decrease in product supply causes a larger decrease in the equilibrium quantity sold.

b. Explain how and why the elasticity of labor demand affects the ability of a union to organize workers.

   If labor demand is more inelastic, a wage increase will generate fewer layoffs. Since unions attempt to attract workers by negotiating wage increases, more inelastic demand gives them greater ability to organize since the wage hikes they pursue will lead to fewer workers being laid off.
3. Suppose that government mandates that all firms provide health insurance to their workers. Further, suppose that no carpenters previously had insurance. Use a labor supply and labor demand model to explain the effect of this mandate on both the equilibrium wage and employment of carpenters. Be sure to explain why the supply and/or demand for labor is affected by the mandate, and indicate whether the effect on wage and employment are positive, negative, or ambiguous. Keep in mind that carpenters will place some value on the health insurance that is provided.

Suppose that the price of this health insurance is $3 per hour. This will cause the labor demand curve to shift downward by $3 per hour since the worker’s MRP is reduced by the amount of the tax. At the same time, the labor supply shifts downward (an increase in supply) because carpenters place some value on the health insurance and are willing to work for a lower hourly wage if they also get this benefit. The amount that the curve shifts downward depends upon the value they place on the health insurance benefit. The effects are illustrated below for the case where the worker places a $3 per hour value on the health insurance. The net effect on employment is zero and the hourly wage rate drops by $3. If the workers place less than a $3 value on the insurance, supply shifts down by less than $3, equilibrium employment drops and the wage rate drops by less than $3. If the workers place more than $3 value on the health insurance, the supply curve shifts down by more than $3, the wage rate drops more than $3 and employment increases. The net effect depends on whether the employee places a value of more or less than the employer’s cost of providing the insurance.
4. Describe what a “noncompete clause” does and explain why firms who invest in training might want to use such language in their employee contracts.

A noncompete clause is contractual language that prevents a worker from accepting employment with a competing firm. For example, a lawyer may be asked to sign an agreement that she/he will not accept employment with a competing law firm within a certain distance of the current employer.

A noncompete clause can be important to firms who invest in training their workers because if the firm is going to recoup the investment in training, the worker must remain with the firm after the training is complete. The noncompete clause makes it more likely that the worker will remain with the original employer.

5. Suppose that the government decides that it wants to force all employers who do not provide health insurance for their employees to finance a government sponsored health insurance plan for the uncovered workers. One proposal would be to tax the sales of all such employers. The other would be to tax the payroll of these employers. If the taxes are designed to generate the same revenue, would workers prefer one tax over the other? Why?

If the tax is on sales, there is only a scale effect on the demand for labor. That is, the sales tax causes supply of the product to decrease, equilibrium quantity to decrease, and the firm will scale back on the use of all inputs (both labor and capital).

If the tax is on payroll, there is both a substitution and scale effect on the demand for labor. The scale effect is as described above, but the substitution effect is that the payroll tax drives up the cost of labor relative to capital, so firms will respond by using more capital and less labor.

Consequently, workers would prefer the sales tax to finance the health insurance since will result in a smaller reduction in the demand for labor, smaller wage cuts and smaller employment losses.
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<td>$11.15</td>
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<td>6.</td>
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<td>Increase $250</td>
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<td>23.</td>
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<td>B</td>
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