FINAL EXAMINATION VERSION B
May 14, 2014

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators, calculators with alphabetical keyboards, computers, wireless devices and mobile phones are NOT permitted. Numerical answers, if rounded, must be correct to at least 3 significant digits. Point values for each question are noted in brackets. Maximum total points are 200.

I. Multiple choice: Please circle the one best answer to each question. [2 pts each, 36 pts total]

(1) A person who is not currently working, but last looked for a job six weeks ago, would be classified in the U.S. as
a.   employed.
b.   unemployed.
c.   out of the labor force.

(2) Economic theory predicts that the higher the market wage, necessarily
a.   the more people will choose to work.
b.   the fewer people will choose to work.
c.   the greater the average hours of work for those people already working.
d.   the fewer the average hours of work for those people already working.

(3) According to the Hicks-Marshall rules, labor demand is more elastic in the long run,
a.   the greater the level of total output.
b.   the greater the elasticity of labor supply.
c.   the greater the capital/labor ratio.
d.   the larger the share of labor in total cost.
e.   all of the above.

(4) In a monopsony labor market, a modest increase in the legal minimum wage will
a.   reduce average wages.
b.   decrease employment.
c.   increase employment.
d.   have no effect on employment.

(5) Consider a diagram of hedonic equilibrium with wages on the vertical axis and risk of injury on the horizontal axis. If firms could eliminate the risk of injury on the job *at no cost*, their isoprofit curves would be
a.   upward-sloping curves.
b.   downward-sloping curves.
c.   upward-sloping 45-degree lines.
d.   vertical lines.
e.   horizontal lines.

(6) Suppose the government encouraged people to get more education--for example, by raising the age of compulsory schooling. According to the signaling model of education, in the long run this action would raise the average worker's
a.   pay.
b.   ability to learn on-the-job.
c.   productivity.
d.   All of the above.
e.   None of the above.

(7) Since 1970, the 90-10 wage ratio in the U.S. has
a.   remained constant.
b.   increased.
c.   decreased.
d.   disappeared completely.

(8) Negative selection of immigrants means immigrants
a.   are forced to come to the U.S. by natural disaster or civil unrest
b.   earn less than native workers.
c.   had lower-than-average skills in their home country.
d.   earn less in the U.S. than they earned in their home country.

(9) Suppose Person A and Person B form a household. Suppose Person A has a comparative advantage in the labor market and Person B has a comparative advantage in home production. Which of the following time allocations would *never* be chosen by that household?
a.   Person A works part-time in the labor market and Person B does not work in the labor market.
b.   Person A works full-time in the labor market and Person B does not work in the labor market.
c.   Person A works full-time in the labor market and Person B works part-time in the labor market.
d.   Person A works part-time in the labor market and Person B also works part-time in the labor market.

(10) Unionism today is highest in which sector of the economy?
a.   Construction.
b.   Government.
c.   Manufacturing.
d.   Utilities.

(11) The efficient bargainng model assumes that the
a.   the employer sets the wage, and then the union chooses the employment level.
b.   the union sets the wage, and then the employer chooses the employment level.
c.   the employer and the union bargain over both the wage and the employment level.
d.   None of the above.

(12) The resistance-curve model of strikes assumes that
a.   the firm is uncertain about the competitive wage.
b.   the firm is uncertain about the union's resolve.
c.   union members are uncertain about the firm's ability to pay high wages.
d.   workers are uncertain about the value of belonging to the union.

(13) Which pay scheme can inadvertently lead to deterioration in quality as workers focus on speed?
a.   efficiency wages.
b.   piece rates.
c.   time rates.
d.   delayed compensation.

(14) Which pay scheme pays workers *less* than their value of marginal product, initially?
a.   efficiency wages.
b.   piece rates.
c.   time rates.
d.   tournaments.
e.   delayed compensation.

(15) According to the efficiency-wage explanation for dual labor markets, wages are higher in the primary sector because, in that sector,
a.   jobs require more human capital.
b.   workers are more able.
c.   jobs are more difficult to supervise.
d.   workers are protected by unions.

(16) If job openings decrease because of a recession, this is called
a.   frictional unemployment.
b.   seasonal unemployment.
c.   structural unemployment.
d.   cyclical unemployment.

(17) The marginal cost of further search is
a.   unrelated to the wage offer in hand.
b.   positively related to the wage offer in hand.
c.   negatively related to the wage offer in hand.

(18) The U.S. unemployment insurance system is characterized by *imperfect experience rating* of employers. This tends to
a.   promote imperfect competition in the labor market.
b.   favor experienced workers over inexperienced workers.
c.   increase the frequency of layoffs.
d.   hold down the total cost of benefits paid.
e.   decrease the required tax rate to fund the system.

II. Problems: Please insert your answer to each question in the box provided. Circle your final answers.

(1) [Individual labor supply – income and substitution effects: 22 pts] The graph below shows Zelda's indifference curves, two true budget lines, and one hypothetical budget line parallel to budget line #1.
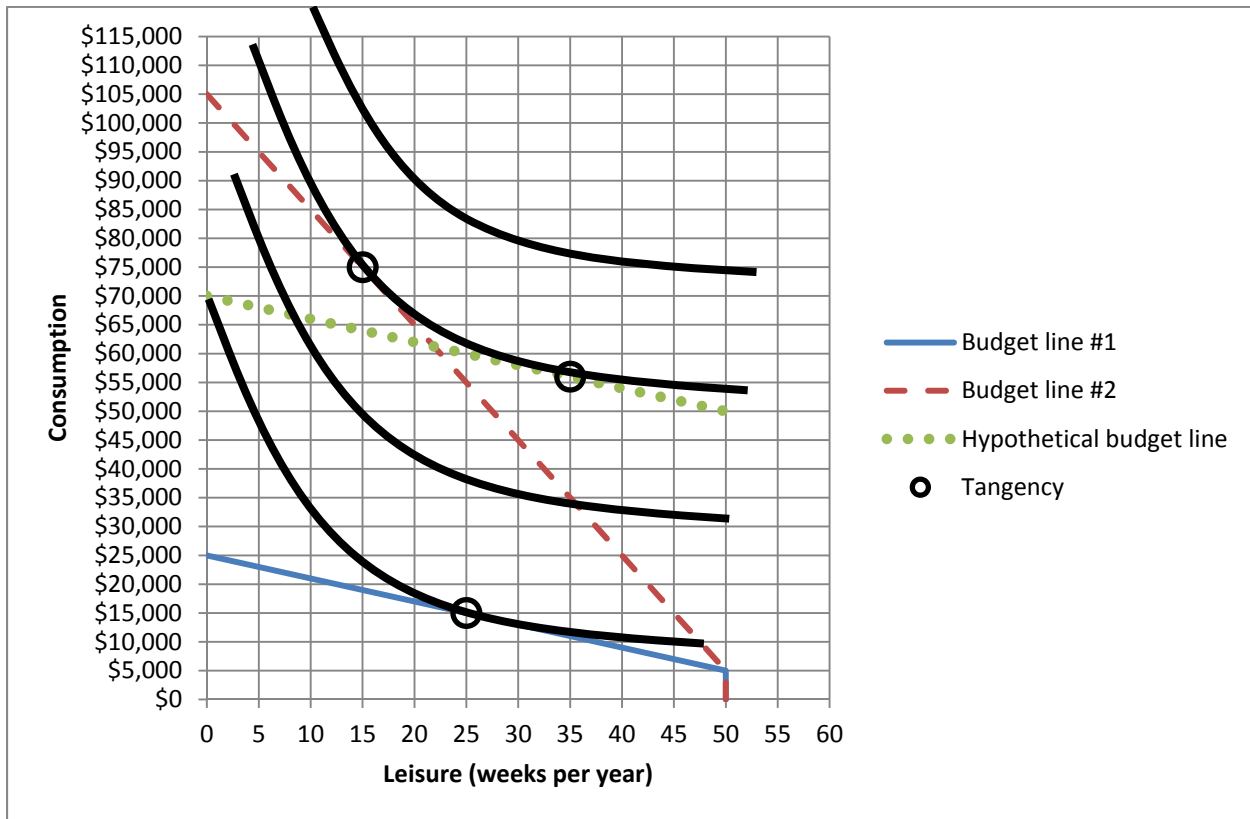
a. According to this graph, what is Zelda's total available time for work or leisure?

	weeks

b. How much nonlabor income does Zelda enjoy?

$	

c. What is Zelda's wage rate on budget line #1?

|	
$	per week

d. What is Zelda's wage rate on budget line #2?

$	per week

Consider Zelda's response to the change in the wage rate from budget line #1 to budget line #2.

e. Does the *income effect* of this change cause Zelda to work *more* or to work *less*?

f. Compute the change in work due to the *income effect* alone.

	weeks

g. Does the *substitution effect* of this change cause Zelda to work *more* or to work *less*?

h. Compute the change in work due to the *substitution effect* alone.

	weeks

i. Does the *total effect* of this change cause Zelda to work *more* or to work *less*?

j. Compute the total change in work caused by the change in the wage rate.

	weeks

k. Using the information in this indifference-curve graph, plot two points on Zelda's *labor supply curve* in the graph on the next page.

Labor supply curve
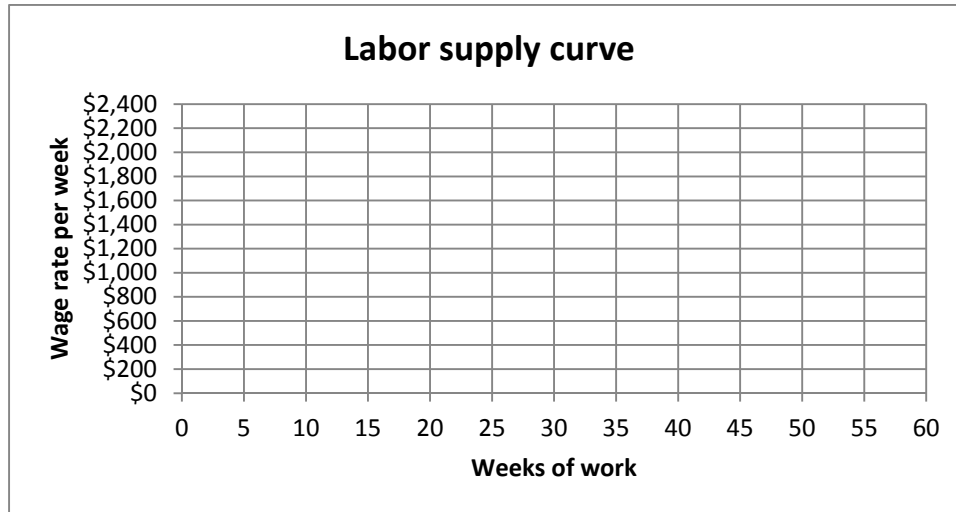
(2) [Value of a statistical life: 4 pts] Job A pays $22 per hour and Job B pays $20 per hour. However Job A carries an annual risk of death of 6/10,000 (=0.0006) while Job B carries an annual risk of only 1/10,000 (=0.0001).
Assume a typical worker works 2000 hours per year. Compute the value of a statistical life from these data.

(3) [LR labor demand – scale and substitution effects: 16 pts] Acme Manufacturing Company uses labor and capital to make widgets. The graph below shows Acme's isoquants, two true isocost lines, and one hypothetical isocost line parallel to isocost line #2.
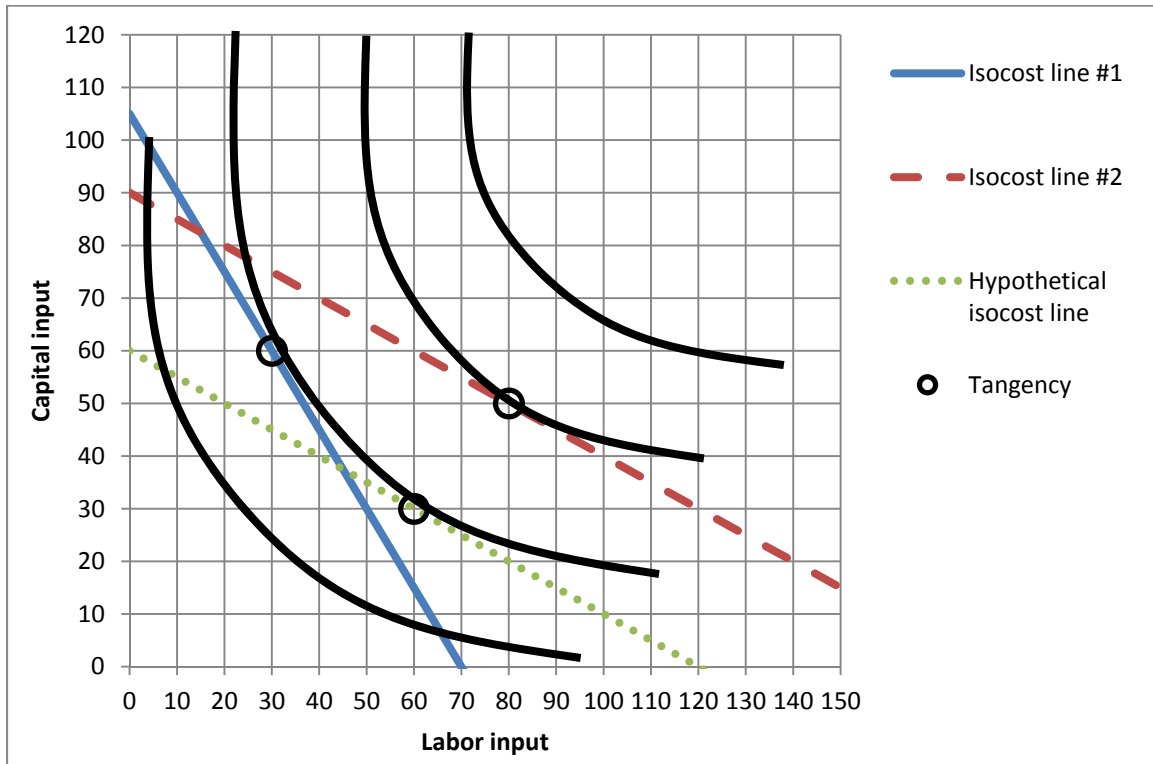
The price of capital used by Acme is always $20. However, the wage (the price of labor) changes.

a. Initially, Acme is on isocost line #1. What is the wage on isocost line #1? $

b. Then in response to a change in the price of labor, Acme moves to isocost line #2. What is the wage on isocost line #2? $

Consider the effects of this change in the wage on Acme's use of labor input.

c. Does the substitution effect cause Acme to use *more* labor or *less* labor input?

d. How much? That is, give the change in labor input caused by the substitution effect of the wage change. units

e. Does the scale effect cause Acme to use *more* labor or *less* labor input?

f. How much? That is, give the change in labor input caused by the scale effect of the wage change. units

g. Does the total effect cause Acme to use *more* labor or *less* labor input?

h. How much? That is, give the change in labor input caused by the total effect of the wage change. units

(4) [Mandated benefits: 6 pts] Assume labor supply is given by $w = -50 + (E/5)$ and labor demand is given by $w = 250 - (E/10)$, where w denotes the daily wage and E denotes the number of workers employed.

    a. Compute the equilibrium wage (w) and employment (E).

Now suppose that the government requires all employers to provide a free lunch to workers that costs employers $9 per day per employee.

    b. Compute the new equilibrium wage (w) and employment (E), assuming the workers do not value the free lunch.

    c. Compute the new equilibrium wage (w) and employment (E), assuming the free lunch is worth $6 to workers.

(5) [Gains from migration: 12 pts] Suppose there are two labor markets: East and West. Demand for labor in East is given by $W_E = 40 - (E_E/2)$, where w_E is the annual wage (in thousands) and E_E is the number of workers (in thousands). Demand for labor in the West is given similarly by $W_W = 80 - (E_W/2)$. Labor is supplied inelastically to each market. Currently, there are 50 thousand workers in each market, for a total of 100 thousand workers.

a. Compute the current wages in each market.

Suppose workers can migrate costlessly between markets in the long run.

b. Compute the equilibrium wages and employment levels in each market in the long run.

c. Compute the increase in efficiency for the two regions combined from migration.

(6) [Simple model of schooling decision: 10 pts] Suppose a person lives for two periods and must choose between two careers. If the person chooses "no college," the person earns $150 thousand in the first period, and then $530 thousand in the second period. If the person chooses "college," the person earns nothing in the first period and pays college costs of $50 thousand, and then earns $742 thousand in the second period.

First, suppose the discount rate between the two periods is **r = 10%.**
    a. Compute the net present value of "no college."

    b. Compute the net present value of "college."

    c. Which career will the person choose: "no college" or "college"?
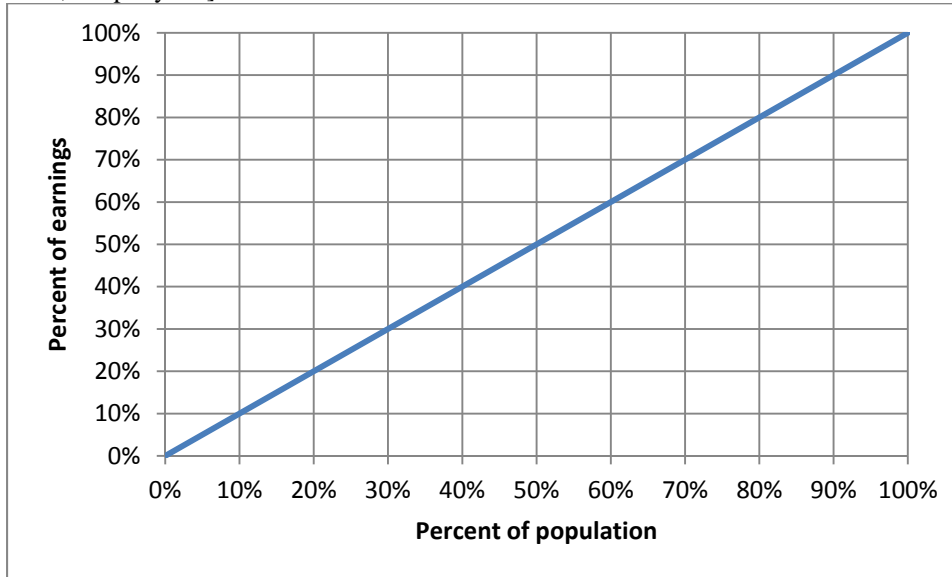
Next, consider the discount rate r* between the two periods that would make the person exactly indifferent between the two careers.
    d. Compute r*.

    e. If a person's discount rate were *less* than r* (found in part d) would that person choose "no college" or "college"?

(7) [Measuring inequality: 16 pts] Suppose 70% of workers earn $20,000 per year and 30% of workers earn $120,000 per year.]

a. [6 pts] Carefully draw the Lorenz curve for earnings in the graph above.
   Circle any kink points.

b. [4 pts] Compute the Gini coefficient.

c. [2 pts] Compute the 90-50 wage gap.

d. [2 pts] Compute the 50-10 wage gap.

e. [2 pts] Compute the 90-10 wage gap.

%
%
%

(8) [Roy model: 6 pts] Country X and Country Y each have workers whose skill (S) ranges from 0 to 100. Suppose the relationship between wages and skill in Country X is given by $w_X = 60 + 2S$. The relationship in Country Y is given by $w_Y = 100 + S$. Assume that moving costs are **$10**.

a. [4 pts] For what values of S will workers in Country X want to migrate to Country Y?

b. [2 pts] Is this immigrant flow positively or negatively selected?

(9) [Monopsony wage discrimination: 12 pts] A certain employer enjoys monopsony power over two groups of workers. Supply of green workers to this employer is given by $w_G = 5 + (E_G/200)$, so that marginal labor cost of green workers is given by $MLC_G = 5 + (E_G/100)$. Supply of blue workers to the same employer is given by $w_B = 1 + (E_B/100)$, so that marginal labor cost of blue workers is given by $MLC_B = 1 + (E_B/50)$. The value of marginal product of all workers is constant and equal to $12.

a. What level of employment (E_G and E_B) will the employer choose for each group?

b. What wage (w_G and w_B) will the employer pay each group?

c. Suppose the government imposes a minimum wage of $10 for all workers. Now what level of employment (E_G and E_B) will the employer choose for each group?

(10) [Welfare effects of monopoly unionism: 4 pts] Suppose the marginal value product in a particular industry (in dollars per year) is $VMP = 120,000 – 0.5\,E$. The competitive wage for workers with the same skills as workers in this industry is $35,000. This industry is however unionized with a union wage of $45,000. Assume the union is a monopoly union, so that the union sets the wage and employers determine employment.

    a. Compute employment in this industry under unionism.

    b. Compute the efficiency cost of the union wage in this industry.

(11) [Markov model: 11 pts] Suppose people move between employment and unemployment every month according to the following Markov transition matrix. Note that two numbers are missing.

		To	
		Employment	Unemployment
From	Employment	(a)	0.03
	Unemployment	0.47	(b)

  a. What number belongs in place of (a)?

  b. What number belongs in place of (b)?

  c. What fraction of employed people lose or leave their jobs or every month?

  d. What fraction of unemployed people find jobs every month?

  e. Compute the steady-state unemployment rate.

(12) [Efficiency bargaining: 9 pts] The graph below shows a labor demand curve (or VMP curve) for a firm. The solid curves are the firm's iso-profit curves. The dotted curves are the union's indifference curves. Choose answers to the questions below from among the circled points on the graph.

First suppose the union is a *monopoly*, setting the wage unilaterally and then allowing the firm to choose employment.

  a. [2 pts] What wage will the union choose? What level of employment will the firm choose in response?

Now suppose the union and the firm engage in *efficient bargaining*, choosing the wage and the employment level simultaneously.

  b. [2 pts] Find an efficient combination of wage and employment that will be just as good for the firm as your answer to (a), and better for the union than your answer to (a).

  c. [2 pts] Find an efficient combination of wage and employment that will be just as good for the union as your answer to (a), and better for the firm than your answer to (a).

  d. [3 pts] List three combinations of wages and employment that are on the *contract curve* for the union and the firm.

(13) [Piece rates and time rates: 16 pts] Suppose two workers stuff envelopes. Abby's marginal cost of effort to stuff envelopes is MC = 0.001 N, where N is the number of envelopes stuffed per hour. Ben's marginal cost of effort is MC = 0.002 N.

Suppose Firm #1 pays a piece rate: $0.15 per envelope.
  a. If Abby worked at Firm #1, how many envelopes would she stuff per hour? What would be her hourly pay?

  b. If Ben worked at Firm #1, how many envelopes would he stuff per hour? What would be his hourly pay?

Suppose Firm #2 pays $12 per hour and fires anyone who does not stuff at least 75 envelopes per hour.
  c. Would Abby prefer to work for Firm #1 or Firm #2, or is this uncertain? Why?

  d. Would Ben prefer to work for Firm #1 or Firm #2, or is this uncertain? Why?

(14) [Search: 10 pts] An unemployed worker is searching for a job. Suppose the marginal benefit of further search, as a function of the wage offer in hand, is $MB = 50 - 2w$, and the marginal cost of further search, as a function of the wage offer in hand, is $MC = 5 + 3w$.

    a. What is the worker's reservation wage?

    b. Would the worker accept a job at $10 per hour? Why or why not?

Suppose unemployment insurance benefits were *decreased*.

    c. Which curve would shift? Up or down? Why?

    d. Would the reservation wage increase or decrease? Why?

    e. Would the average time to find a new job increase or decrease? Why?

III. Critical thinking: Write a short essay answering the question below. [4 pts]

(1) [Seniority and wages] In cross-section data, it is frequently found that workers with greater seniority earn higher wages, holding education and total labor-market experience constant. Describe briefly yet clearly three theories that might explain this pattern in the data.

Write your answer below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling.

[end of exam]