ECON 360 - LABOUR ECONOMICS

WINTER 2007 Queen's University

MIDTERM EXAM, Version A

Answer key

PART I Multiple choice questions

1. Workers choose whether to work in a risky or in a safe job. Suppose there are 100 workers in the economy. Worker 1's reservation price (for accepting the risky job over an equivalent safe job) is \$1; worker 2's reservation price is \$2, and so on. Because of technological reasons, there are only 8 risky jobs and they all need to be filled. What is the equilibrium compensating wage differential between safe and risky jobs?

- A. \$8
- B. \$0
- C. \$100
- D. \$1
- E. \$64

2. Which of the following is true for the "backward-bending" range of the labour supply curve?

- A. The income effect is dominated by the substitution effect.
- **B.** The substitution effect is dominated by the income effect.
- \overline{C} . There is no income effect.
- D. There is no substitution effect.
- E. The income and the substitution effects exactly offset each other.

The next three questions refer to the following setup. Consider a firm for which production depends on two normal inputs, labour and capital, with prices *w* and *r*, respectively. Initially, the firm faces market prices of w = 10 and r = 7. These prices then shift to w = 6 and r = 3.

3. In which direction will the substitution effect change the firm's employment and capital stock?

- A. There will be a substitution away from labour and towards capital.
- B. There will be a substitution away from capital and towards labour.
- C. There will be a substitution away from both labour and capital.
- D. There will be a substitution towards both labour and capital.
- E. The direction of the change will depend on whether the substitution effect or the scale effect is stronger.

4. In which direction will the scale effect change the firm's employment and capital stock?

- A. The scale effect will increase the demand for labour but decrease the demand for capital.
- B. The scale effect will decrease the demand for labour but increase the demand for capital .
- C. The scale effect increases the demand for both labour and capital.
- D. There will be no scale effect.
- E. The direction of the change will depend on whether the substitution effect or the scale effect is stronger.

- 5. Can we say conclusively whether the firm will use more or less labour? More or less capital?
- A. The firm will certainly use more labour, but the change in the amount of capital will depend on whether the substitution or the scale effect for capital dominates.
- B. The firm will use more of both capital and labour.
- C. The firm will use less of both capital and labour.
- **D.** The firm will certainly use more capital, but the change in labour employed will depend on whether the substitution or the scale effect for labour dominates.
- E. The amounts of both labour and capital will stay the same, because for both inputs, the substitution and the scale effect cancel out.

Questions 6 and 7 refer to the following problem. Consider an occupation in which the value of the marginal product of an untrained worker is $VMP_U = \$12$, while the value of the marginal product of a trained worker is $VMP_T = \$16$. Suppose that during the training the value of the marginal product of a worker is $VMP_D = \$8$ (net of the costs of training). Denote the wage during training as w_D and the post-training wage as w_T , and assume that the labour market is competitive.

6. If the training is firm specific and, after the training, the worker has no bargaining power, then

- A. w_D will be between \$8 and \$12; w_T will be between \$12 and \$16
- B. w_D will be between \$8 and \$12; $w_T = 12
- C. $w_D = \$8; w_T = \16
- **D.** $w_D = \$12; w_T = \16
- **E.** $w_D = \$12; w_T = \12

7. Which of the following is true if the training is general?

- A. w_D will be between \$8 and \$12; w_T will be between \$12 and \$16
- **B.** w_D will be between \$8 and \$12; $w_T = 16
- **C.** $w_D = \$8; w_T = \16
- $\overline{\text{D.}} \quad w_D = \$12; \ w_T = \$16$
- E. $w_D = \$12; w_T = \12

8. Which of the following is <u>not</u> a prediction of the job search theory?

- A. Unemployment benefits increase the length of the average unemployment spell.
- B. All else equal, a 30 year old worker will have a higher reservation wage than a 54 year old worker.
- C. In a two-period model, the first period reservation wage exceeds the second period reservation wage.
- **D.** In a two-period model, if a worker rejects his first period wage offer (w_1) but accepts his second period offer (w_2) , then $w_2 > w_1$.
- E. Unemployment can be voluntary.
- 9. An increase in the interest rate leads people to invest less in human capital because
- A. as the interest rate rises, the net present value of education rises.
- B. more able people benefit from education more than less able people.
- C. education is a screening device.

D. the marginal rate of return to education decreases as schooling continues.

E. investment in education is subject to increasing marginal returns.

10. In the work-leisure choice model, if the wage rate increases from below Linda's reservation wage to above Linda's reservation wage, then

- A. Linda will work less.
- **B.** Linda will enter the labour force.
- \overline{C} . Linda will choose more leisure.
- D. Linda will start having reservations about her current job.
- E. Linda will leave the labour force.



11. This question refers to the above graph. Firms A and B use capital (K) and labour (E) in their production and the above graphs represent their respective isoquants. Which of the following is true?

- A. For both firms, capital and labour are perfect substitutes
- B. For both firms, capital and labour are perfect complements
- C. For firm A, capital and labour are perfect complements, while for firm B they are perfect substitutes.
- D. For each firm, capital and labour are neither perfect substitutes nor perfect complements.
- *E.* For firm A, capital and labour are perfect substitutes, while for firm B they are perfect complements.

12. Newly hired workers tend to leave their jobs within 24 months of hire, while workers with more <u>seniority</u> rarely leave their jobs. Which of the following could explain this?

- A. The theory of firm-specific training.
- B. The theory of equalizing wage differentials.
- C. The signaling theory of education.
- D. The human capital theory of education.
- E. The theory of general training.

13. An individual with 100 hours a week to allocate between work and leisure has the utility function represented by U(C, L) = C.L. Suppose this person currently has a weekly income of \$900 and chooses to work 40 hours per week. What is this person's non-labour income per week (V) and hourly wage (w)?

- A. V = \$0 and w = \$15
- B. V = \$600 and w = \$0
- C. V = \$200 and w = \$10
- D. V = \$280 and w = \$8
- **E.** V = \$300 and w = \$15

14. Suppose there are two types of persons: high-ability and low-ability. A particular diploma costs a high-ability person \$8,000 and costs a low-ability person \$20,000. Firms wish to use education as a screening device where they intend to pay \$K to workers without a diploma and \$60,000 to those with a diploma. Education will be an effective screening device if

A. K = \$18,000 B. K = \$35,000

- C. K = \$22,000
- **D.** K = \$50,000**E.** K = \$43,000

15. Consider an economy with two sectors, A and B. In the absence of government regulation, the equilibrium wage in each of the two sectors would be \$8. However, sector A is covered by a minimum wage of \$10, while sector B is not covered by a minimum wage law. Workers can seek jobs in either of the two sectors, but a worker who seeks job in sector A and does not find one remains unemployed. The probability a worker can find a job in sector A is 0.9 (i.e., 90 percent). The utility of an employed worker is U = w, where w is the worker's wage; the utility of an unemployed worker is zero. In equilibrium, what will be the wages paid by the firms in the two sectors?

- A. $w_A = \$11$ and $w_B = \$8$
- **B.** $w_A = \$10$ and $w_B = \$9$
- \overline{C} . $w_A = \$11$ and $w_B = \$9$
- D. $w_A = \$10$ and $w_B = \$10$
- E. $w_A = \$10$ and $w_B = \$8$

16. In empirical estimates of returns to schooling, the ability bias

A. tends to bias the estimates of the returns to schooling upwards.

- \overline{B} . tends to bias the estimates of the returns to schooling downwards.
- C. tends to bias the estimates of the returns to schooling for twins.
- D. arises because people with greater natural abilities are biased against schools.
- E. arises because schooling is less useful to people with greater natural abilities than to those with low natural abilities.
- 17. Competitive labour markets are Pareto efficient because
- A. there are no gains from trade in these markets.
- **B.** they are regulated by the government.
- **C.** nobody can be made better off without making at least one other market participant worse off.
- \overline{D} . firms prefer use workers rather than machines.
- E. monopsonistic labour markets are not.



18. This question refers to the above graph. In deciding whether or not to go to college, one would compare the discounted value of

- A. area N to the discounted value of area L.
- B. area N to the discounted value of area M.
- C. areas N and L to the discounted value of area M.
- **D.** area N to the discounted value of areas L and M.
- E. areas N and M to the discounted value of area L.

- **19.** Frictional unemployment arises
- A. when the workers quit because of frictions with their co-workers.
- **B.** when workers need time to locate job openings and to acquire information about the jobs.
- C. because the number of workers looking for work exceeds the number of jobs.
- D. because skills are specific to a job and workers need time to acquire new skills.
- E. when firms are not willing to pay the compensating wage differential.

20. In the signalling theory of education,

- A. education is completely wasteful, because it does not improve productivity.
- B. education is valuable because it enhances a person's stock of human capital.
- C. education is completely wasteful, because low ability people always have an incentive to pretend their abilities are high.
- D. education is valuable because it provides people with firm-specific training.
- education is valuable because it helps employers to better match workers with jobs.

PART II (3 questions; the total is 40 points)

Answer each of the following questions on the page on which it is given. Label clearly any line you draw. If calculations or written answers are required, always provide an explanation for your final answer, or indicate how you got it.

1. Mike's utility from consumption and leisure is U(C,L) = C.L. There are 100 hours in the week and he earns \$5 per hour.

a) 5 pts What is Mike's optimal amount of consumption and leisure if he has no non-labour income?
if Mike has no non-labour income, his budget constraint is:

$$C = 5(100 - L) = 500 - 5L$$

 $Max \ U = (500 - 5L)L = 500L - 5L^2$
 $\frac{du}{dL} = 500 - 10L = 0$
 $L = 50$
 $C = 5(100 - 50)$
 $C = 250$
Mike's optimal choice if
he has no non-labour income
is consumption of C=\$250 and
leisure of L=50

b) 5 pts If the government starts a welfare policy that pays B to all non-workers and pays \$0 to all workers, at what value of B will Mike opt out of the labour force in order to go on welfare?

if Mike decides to work, his optimal choice is to work 50 hours, and receive C=250 and L=50, as shown above if Mike doesn't work, he receives C=B and L=100 the value of B at which Mike will stop working is given by U(B, 100) = U(250, 50), '. of B=\$125 (or any amount 100B = (250)(50), '. of B=\$125 (or any amount 100B = 12500 force to go on welfare B = 125 2. a) 6 pts In the graph below, represent a monopsonist's optimal hiring decision. Be sure to draw and clearly label all the curves relevant for the decision, as well as the monopsonist's optimal wage and employment level. Don't forget to label the axes.



b) 5 pts In the same graph, show the wage and the employment level that would prevail under perfect competition. If there is a deadweight loss under monopsony, show the area that represents it.

We and Ec are the wage and employment level that would prevail under PC. The shaded triangle is the deadweight loss under monopsony. 5



c) 6 pts Draw <u>again</u> the initial graph from part a) and represent graphically the effects of a minimum wage on the monopsonist's wage and employment level. Denote the minimum wage as w^{min}.



PART II (3 questions; the total is 40 points)

Answer each of the following questions on the page on which it is given. Label clearly any line you draw. If calculations or written answers are required, always provide an explanation for your final answer, or indicate how you got it.

sufety

Suppose firms can provide more or less flexible working hours and assume that providing more flexibility is increasingly costly for each firm. Workers view flexible working hours as good job attributes for which they are willing to pay through lower wages.

a) 7 pts In the graph below, draw two indifference curves, one for a worker who loves flexibility and one for a worker who loves income. Similarly, draw two isoprofit curves, one for a firm for which flexibility is easy to provide and one for a firm for which it is costly to provide. Put the degree of flexibility on the horizontal axis. (If you prefer, work with the degree of *inf*lexibility. In either case, indicate on the axis the direction in which flexibility increases.) Show which worker will be matched with which firm and show the points that represent the two employment contracts. Indicate in the graph the respective wages and the degrees of flexibility the two contracts would specify.



b) 6 pts In the graph below, represent a contract between a single firm and a single worker. Draw a hypothetical hedonic wage function and show what happens to the wage if the government imposes legislation that requires that all firms offer a degree of flexibility equal to at least F (on your scale of flexibility). Draw the indifference curve that represents the worker's new utility level. Assuming all firms always earn zero profits, explain whether this policy makes the worker better off or worse off.



Before the government imposed to jistation, the worker indifference curve was 44 and waye 2*

After the legislation, the workers indifference curve shifted down and to the right U' and their waye decreased to zuf. Because U*>U', and U*> ZF, the policy makes the worker worse off.