Andrew Dickinson
EC330, Summer 2021
PS 02

Name (Print): _____

Student ID _____

Please write all answers in legible handwriting in the space provided. **3.5** points will be added to your score for signing your name, though those points will be deducted if the grader cannot read what you wrote on your pdf scan. For math questions, show all relevant work. **For questions with numeric answers, clearly circle or box your final answer.**

Total points possible: 37.5

Multiple Choice

1. (1 point) Which of these is NOT one of Edward Glaeser's three simple rules that he suggested in place of the myriad regulations on building that are currently in place around the world?

   (A) Limit and carefully define the scope of historic preservation

   (B) Use a system of fees to compensate neighbors for the downsides of tall buildings (such as blocking light or views)

   (C) Allow neighborhoods the authority to cultivate their own special character (but not prevent building altogether)

   (D) Encourage the construction of taller buildings by replacing the current system of property taxes (which factor in the presence and types of buildings) with Henry George's land tax

2. (1 point) As described by Edward Glaeser in Triumph of the City, which of these was NOT something that urbanist and activist Jane Jacobs argued and worked for in New York City?

   (A) Densities between 100 and 200 households per acre

   (B) Very tall residential skyscrapers (more than 40 stories) to allow for more preservation of other beloved structures and neighborhoods elsewhere

   (C) Moderate building heights (i.e., several stories, but not many stories)

   (D) Mixed-use development (combining elements of residential and commercial spaces, with perhaps some forms of manufacturing as well)

3. (1 point) For which of these policies does Glaeser express the most skepticism in terms of its potential to bring suburbanites back to downtown living?

   (A) Higher taxes on gasoline

   (B) Congestion taxes

   (C) Compact high-rise development downtown

   (D) None of the above

4. (1 point) Which one of these was one of the ways in which William Levitt (the "Father of Suburbia" or "King of Suburbia") reduced construction costs in his mass-produced suburban developments?

   (A) All of the other answers are correct.

   (B) He made use of new equipment and techniques, such as spray painting.

   (C) He bought a wide variety of items (such as lumber and televisions) directly from manufacurers rather than buy from distributors.

   (D) He established a factory to make his own nails

   (E) He divided the construction process into 26 steps and hired specialized subcontractors.

5. (1 point) By Glaeser's account, which of these is the most important factor explaining why Atlanta, Dallas, Phoenix, and Houston are the fastest growing large cities in the United States?

   (A) Low state and local taxes (income taxes, property taxes, sales taxes)

   (B) An abundance of high-wage jobs

   (C) Warm climate

   (D) Affordable housing thanks to plentiful supply

Short Answer

6. (5 points) **Minimum wage in Urban Labor Markets** Suppose the labor markets for Baristas in San-Fransisco (SF) & Oakland (OAK) are perfectly competitive (we will relax this later). Supply and demand in SF are parameterized by:

$$\text{Demand} : W_d^{SF} = 30 - 2 * Q_d^{SF}$$
$$\text{Supply} : W_s^{SF} = 12 + Q_s^{SF}$$

In Oakland, labor supply and demand are given by:

$$\text{Demand} : W_d^{OAK} = 30 - 4 * Q_d^{OAK}$$
$$\text{Supply} : W_s^{OAK} = 6 + 2 * Q_s^{OAK}$$

(a) (1 point) Carefully graph each cities labor market. Be sure to indicate which graph represents which labor market. Label all intercepts.

(b) (1 point) Compute the equilibrium in each city. (You must provide wages and quantities in each city.)

(c) (1 point) Suppose that SF implements a minimum wage of 20 an hour. Draw the labor market graph for SF again with the min wage added. Label **and compute** the associated labor surplus.

(d) (1 point) Suppose some fraction of the unemployed workers in SF moved to Oakland to look for work. What does this do to the supply curve for Baristas in Oakland? Can a *place-based* labor policy in SF impact workers in other places (like Oakland?)

(e) (1 point) Would your answer to part D be the same if the federal government enacted a binding minimum wage? (No math is required, just state your answer with a sentence or two to back it up.)

7. (4 points) **Urban Labor Markets Part II.** Suppose we have two cities, A & B. Suppose A's labor market is a complete monopsony, and B's market is perfectly competitive. The labor market for A is given by:

$$\text{Demand} : W_d^A = 35 - 3 * L_d^A$$
$$\text{Supply} : W_s^A = 5 + 1.5 * L_s^A$$

The labor market in B is given by:

$$\text{Demand} : W_d^B = 40 - 2 * L_d^B$$
$$\text{Supply} : W_s^B = 4 + L_s^B$$

(a) (1 point) Solve for the monopsonist equilibrium in city A and the competitive equilibrium in city A. Compare them. **Note:** Not a typo, solve both equilibria for city A. For the monopsony equilibrium you must write down the marginal cost MC_L first.

(b) (1 point) Solve for the competitive equilibrium in city B.

(c) (1 point) Graph the monopsony equilibrium of city A and perfect competition equilibrium of city B on two graphs side by side

(d) (1 point) The federal government wants to set a federal minimum wage to maximize the number of people employed across both labor markets. What minimum wage (not place-based) yields the maximum level of overall employment ($L_A^* + L_B^*$)? Provide both the specific minimum wage and the level of employment it yields.

8. (5 points) **Utility.** Suppose we have two cities, 1 and 2. Assume every individual has the same utility function given by:

$$u(w_j, r_j) = 4 * w_j - 0.75 * r_j$$

where $j = 1$ or $j = 2$. Furthermore, for all parts of the problem assume the total population is fixed at $1,000$ and wages in each city are given by:

$$w_1 = 15$$
$$w_2 = 12$$

(a) (1 point) What is the utility from each choice if $r_1 = 20$ and $r_2 = 15$. Is this an equilibrium? How do you know? (2 points)

(b) (2 points) For the rest of the problem you can now assume that rents are increasing in the population of each city. Specifically, assume $r_1(L_1) = 4 * L_1$ and $r_2(L_2) = 8 * L_2$. Compute the equilibrium population of each city equilibrium rents. (2 points)

(c) (1 point) Now suppose the government decides to levy a flat income tax of 10% on **all workers**. What are the new equilibrium population levels in each city? **Note**: your answer may include fractions/numbers with decimals (2 points)

(d) (1 point) Now the the government levels the 10% income tax on only people in city 1. What are the new equilibrium population levels in each city? Compare your answer to part (c). How did it change? Why? (2 points)

9. (7 points) **Land-Use Regulations.** Suppose the rental market in Eugene is perfectly competitive and characterized by the following equations:

$$\text{Demand} : R_d = 20 - H_d$$
$$\text{Supply} : R_s = (1 + k) * H_s$$

where R is rental price, and k is the level of land-use restrictions in Eugene. For now, we will not assign a value to k.

(a) (1 point) Solve for the equilibrium price and quantity in terms of k. What happens to equilibrium price and equilibrium quantity as you increase the land use regulations (increase k)?

(b) (1 point) Graphically illustrate your answer to part (a). That is, draw the initial equilibrium, and illustrate what happens to the equilibrium when k increases.

(c) (1 point) Now suppose $k = 2$. Compute the equilibrium using the equations derived in part (a).

(d) (1 point) The Eugene public is upset over high rental prices so they demand that the local government fixes the issue. They deem that the maximum price anybody should pay for rent is one less than the equilibrium price you computed in part (c). The local government implements a rent control of of the price in (c) minus 1. Quantify the shortage of housing arising from the rent control when $k = 2$ using the supply and demand equations.

(e) (1 point) An alternative to rent control would be to lower land-use restrictions. Find the level of land use restrictions k such that equilibrium rents are the equilibrium price with rent control in part (d). Show your work.

(f) (1 point) In the housing market, which policy is more efficient? (Think back to the 201 definition of efficiency). Does the solution proposed in part (e) involve any costs? What might be some consequences to lowering land use regulations? No math is needed. (1 points)

(g) (1 point) How would your answer to part (d) change if the rental market in Eugene was monopolized?

10. (3 points) **Commuting Costs** Connor commutes each day to UO from his house to the north of campus. Recall the model of trip costs presented in lecture: $Tripcost = m + T_a \cdot d_a + T_v \cdot d_v$. Assume that for Connor, these parameters are equal to the following:

	Walking	Cycling	Car	Bus
m: Monetary Cost (dollars)	0.2	0.3	1	1.5
T_a: Access Time	0	0.5	2	5
d_a: Marginal Disutility per access minute (in \$)	1	1	1	1
T_v: In-vehicle time	10	5	3	6
d_v: Marginal Disutility per in-vehicle minute (in \$)	0.6	1	0.5	0.3

(a) (1 point) Calculate Connor's Trip cost for each Mode of transportation. Be sure to show your work. (2 points)

- Walking cost =
- Cycling cost =
- Car cost =
- Bus cost =

(b) (1 point) Based on the table above, what mode of transport will Connor pick? Why?

(c) (1 point) Will a tax of \$2 on each automobile trip induce Connor to change his commuting habits? Explain why or why not, being sure to reference the relevant numbers.

11. (5 points) **Externalities** Suppose we are trying to figure out the optimal congestion tax. Suppose have the following:

$$\text{PMB} : Cost = 1000 - 100 * n$$
$$\text{PMC} : Cost = 200 + 100 * n$$
$$\text{SMC} : Cost = 400 + 100 * n^2$$

where PMB = private marginal benefit (or demand.), PMC = private marginal cost (also called Marginal Private Trip Cost) and SMC = social marginal cost. Furthermore, $Cost$ is the trip cost and n is the number of vehicles on the road.

(a) (1 point) Compute the private equilibrium number of cars (n^*) and cost ($Cost^*$)

(b) (2 points) Compute the socially optimal equilibrium number of cars (n_s^*) and cost ($Cost_s^*$). **Hint:** You will need to use the quadratic formula to solve this. Also, you can assume $n \geq 0$

(c) (2 points) Compute the socially optimal tax.