Applying the Concepts

Chapter 6

For the continuous evaluation, regarding exercises you may use your answer sheet to answer the professor.
For questions where you have to explain something **you may not use your answer sheet** to respond to the professor in class. You will be evaluated on your reasoning in class.

1. Elevator and the Vertical Price of Office Space
Draw a curve showing the price of office space (per square foot) within a building, with the horizontal axis measuring the (vertical) distance from the street (in meters) for the following cases.
a. People walk up and down stairs, and there are no views on higher floors.
b. People ride elevators up and down, and there are no views on higher floors.
c. People ride elevators, the lower floors have traffic noise and the view is better on higher floors.

2. Commuting Methods and Housing Prices
The 19th century brought many changes in commuting, from walking to omnibuses, electric trolleys (streetcars), and subways.
a. For each commuting method, draw a housing- price curve for a monocentric city, labeling each curve with the date on which the method was introduced.

b. Over time, the feasible radius of the city [increased, decreased] because **…**

3. Manufacturing: Labor vs. Freight Cost

Consider a manufacturing firm that exports its output from a port in the city center and employs workers who live in a suburb six miles from the center. The daily freight cost is $9 per mile. The firm's daily labor cost increases from $20 at the suburb to $50 at the center.

a. Using Figure 7-3 as a model, show the firm's labor cost, freight cost, and total cots for locations from the center to the suburb. Total cost is minimized at the [city center, suburb].

b. Suppose the intracity truck is introduced, decreasing the daily freight cost. The firm will be indifferent between the city center and the suburb if the daily freight cost is ___ per mile. In this case, total cost in the suburb is ___, computed as ….

c. Suppose the daily freight cost per mile is three fifths of the value you computed in part (b). Total cost is minimized at the [city center, suburb], with a cost of ___, computed as …. Illustrate with a graph.

d. For part (c), the firm chooses [city center, suburb] because the cost of moving its output one mile is ___, while the cost of moving the workforce one mile is ___.

4. Gas Tax and Suburb versus Central City

Consider a software firm with 10 workers who live in a suburb due east of the city center and commute by automobile at a cost of $20 per worker per day. The firm exchanges products and information with other software firms in the center and the savings in exchange costs from locating in the center as opposed to the suburb is $400 per day.

a. The firm will be willing to pay more for a site in the [city center, suburb] because …

b. Suppose a gas tax doubles the daily commuting cost. The firm will be willing to pay more for a site in the [city center, suburb] because ….

c. Suppose that cost of commuting by public transit is $28 per worker per day. The gas tax remains. The firm will be willing to pay more for a site in the [city center, suburb] because ….

5. Urban sprawl in Europe

How did affect the centralized planning and the extensive use of public transportation of the ex-socialist countries on their urban pattern? Can you tell an exception?

6. Urban sprawl in Europe, Spain.

Which province capitals are integrated in Madrid metropolitan area ?
Which factors may explain Madrid growth in the last decade?
Do cities play an important role in coastal sprawling in Spain? Explain your answer.

7. Urban sprawl in Europe, Costs.

Why is urban sprawl as opposed to compact cities, more expensive for the society and the environment?

8. Was the Moncentric City a Fluke?

Consider the following statement: "The large traditional monocentric city of the 19th century was a fluke, a result of a particular sequence of technological innovations in intraurban transportation. If the sequence had been slightly different, the large monocentric city would have never developed. Instead, we would have gone from the small cities of the 18th century directly to the large multicentric, suburbanized city that we see today."

a. For each of the following intraurban transport technologies, specify its starting date (the year it was introduced): Horse-drawn wagon (chariot) ___; Ominbus ___ ; Elevator ___;Electric trolley (streetcar) ___ Subway ___; Intracity truck ___

b. If we change the date for the introduction of the ___ to ___, the large monocentric city would never have developed because ---

9. By Land and by Air

Consider a manufacturing firm that occupies one hectare of land in rectangular city. The firm producer 10 tons of output per day and transports six tons on transports the remaining four tons on airplanes that leave from an airport seven miles east of the city center ($x = 7$). Intraurban transportation is via trucks, with a unit cost of $25 per ton per mile. The firm does not engage in factor substitution as the price of land changes. To simplify, assume that labor cost are the same at all locations. The firm´s bid-rent for land at the city center is $400.

a. Draw the firm´s bid-rent curve for land from the city center to 10 miles east.

b. The slope of the bid-rent curve for the segment from x = 0 to x = 4 is ___, computed as ….

c. The slope of the bid-rent curve for the segment from x = 4 to x = 7 is ___, computed as ….

c. The slope of the bid-rent curve for the segment from x = 7 to x = 10 is ____, computed as ….

9. Bigger Prize for Tallest Building
Using Figure 7-4 as a starting point, suppose the prize for having the tallest building increases from $200 to $350, and there is still a second price for having the second tallest building of $200.
a. The outcome of the competition for being the tallest will generate one building with ____ floors and a second building with ____ floors because …

b. With the larger prize, the building profit of the winner (excluding the prize) is _____ and the building profit of the loser is ____.
c. The increase in the prize [increases, decreases, does not change] the total payoff, equal to the sum of building profits and the prize.