

BUSI 300

Answer Guide No. 7

CHAPTER 8: Time and Urban Growth

1. Answer: (3)
If a person is "myopic," it means that he or she cannot see into the future and they base their decisions only on economic conditions as they are today.
2. Answer: (2)
The equilibrium land rent function for new development in period 0 is $r_0(d) = 1/(4U_0^*{}^2) \times (Y_0 - t_0 \times d)^2$, which equals $1/(4 \times 7^2) \times (120 - (6 \times 5))^2 = (1/196)(120 - 30)^2 = (1/196)(8,100) = 41.3265306122$.
3. Answer: (1)
The equilibrium density function for new development in period 0 is $D_0(d) = 1/(2U_0^*{}^2) \times (Y_0 - t_0 \times d)$, which equals $1/(2 \times 7^2) \times (120 - (6 \times 2)) = 1/98 (120 - 12) = (1/98) (108) = 1.10204081633$ persons per square kilometre.
4. Answer: (4)
An increase in income causes both the land rent and population density functions to shift upward.
5. Answer: (1)
Because development is durable, in the sense that lot sizes inside b_0 are given by their historical values from period 0, new development only occurs in the interval between the old border b_0 and the new border b_1 . In other words, the city grows by adding a bit of new development at its edge. Inside b_0 , nothing changes.
6. Answer: (4)
Redevelopment should occur when the value of a new property (with its currently optimal lot size and structure) exceeds the value of the existing property on a parcel (with its historical lot size and structure) by more than the cost of demolition.
7. Answer: (3)
If incomes continue to rise over time, as the city expands population density will follow a sawtooth pattern. In this model, the city grows by adding a bit of new development in each time period where the density of new development is determined by current economic conditions. If economic conditions change between time periods, then the density of new development will "jump" at the borders between the time periods, giving the sawtooth pattern.

8. Answer: (1)
A landowner with perfect foresight chooses the date and form current development and future redevelopment to maximize the present value of future land rents. This might involve different land uses at different points in time. For example, it might be best to initially develop a parcel as housing and then later convert it into a commercial use. In Option (1), the landowner knows which development and future redevelopment will maximize the present value of his or her future land rents. Option (3) is incorrect because this landowner does not have perfect foresight. A person who has "perfect foresight" knows the future with certainty and uses this information when deciding on a course of action. The landowner in Option (3) does not have perfect foresight; they are taking a guess on what is going to happen in the future. Option (2) is incorrect because a landowner with perfect foresight will not base his or her investments on current economic conditions. The investor will base it on current and future conditions because he or she will know exactly what is going to happen and what will make the investor the most money.
9. Answer: (2)
The data suggests that population growth, in addition to size, has an impact on inter-metropolitan differences in land prices.
10. Answer: (3)
Agricultural land near the city border of a growing city sells for a price in excess of the present value of the agricultural land rent. The growth premium declines as one moves out farther away from the city boundary because the expected conversion date (from agricultural to residential) moves further into the future; future rent increases on these parcels are discounted more heavily. The growth premium becomes larger as the expected rate of population growth increases.