

Place your name on the back of this sheet of paper and nowhere else. Staple your answers on the front of this sheet of paper. Failure to follow these directions will cost you 1 point. Your assignment will be typed, except graphs can be drawn by hand and mathematical equations can be done by hand. Failure to type it will cost you 10 points. If you use double-sided printing or print on the back of scrap paper, I will give you one additional point.

1) (35 points) Draw an isoquant/iso-cost diagram which has the price of labor at $w = \$10/L$ and the price of capital at $r = \$5/K$. Draw three of each type of line. Explain how you got the three iso-cost lines and how you know they show the correct wage-rental ratio. Find the expansion path. Given the first two points on your expansion path, does your production function exhibit increasing returns-to-scale (IRTS), constant returns-to-scale (CRTS), or decreasing returns-to-scale (DRTS)? Explain your logic and show all calculations.

2) (45 points) Draw an isoquant/iso-cost diagram which has the price of labor at $w = \$4/L$ and the price of capital at $r = \$12/K$. Draw three of each type of line. Explain how you got the three iso-cost lines and how you know they show the correct wage-rental ratio. Find the expansion path. Draw an increase in the wage rate to $\$8/L$. Explain how you got the three new lines. Draw the new expansion path. What happens to the K/L ratio for the different levels of production? How can you tell by looking at the graph? Does that make economic sense?

3) (5 points) When we look at the expansion path, are we looking at the long-run or the short-run? Explain your logic.

4) (15 points) What is the slope of an iso-cost line? Prove it mathematically.