

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. If you use double-sided printing or print on the back of scrap paper, I will give you one additional point.

1) (40 points) Suppose your inter-temporal utility function is given by $U(C_0, C_1, C_2) = (C_0 C_1 C_2)^{1/4}$ and your income this year is \$200, next year \$121, and you want to be retired in the third year. If the interest rate is 10%, then find the utility maximizing levels of consumption for the three years. Show all work. What is the cost of consuming \$1 worth of more goods this year? Explain your logic.

2A) (20 points) Suppose your utility function is $U(F, H) = F^{1/2} H^{1/4}$, the price of food is \$1/F and the price of housing is \$2/H. Find the utility maximizing quantities of food and housing you would buy if you earned \$486. Show all work.

B) (20 points) Using the same utility function and prices, find the minimum income you must earn have if you wanted 54 utils of utility. Show all work.

3) (20 points) Use the production function $Q(K, L, T)$ and the cost of capital is \$r/K, the wage rate is \$w/L, and the cost of land is \$t/T. Use this to derive the equi-marginal principle for producing goods. Show all work.