

**Test #1**

Points for each problem are shown out of 100 points. Each subsection in a problem is weighted equally.

Please show the calculations used to arrive at your answers. Draw graphs neatly and label axes and points clearly. Round answers to the first decimal place if necessary.

A. (20 pts) Answer True, False, or Uncertain, and briefly explain your answer.

- (1) Average cost curves are always downward-sloping.
- (2) If a person is risk averse, then he will always insure fully if offered "fair" insurance.
- (3) If X is a normal good, then the demand curve for X is never upward-sloping.
- (4) If a person is a lender and the interest rate decreases, he will always become a borrower.

B. (20 pts) Short answers.

- (1) Draw a budget constraint for goods X and Y and show what happens when a quantity tax is placed on Y.
- (2) Draw two indifference curves for a person who has strictly concave preferences.
- (3) Given a demand curve  $Q_D = 10 - 2P$ , when the price changes from 2 to 3, what is the associated deadweight loss?
- (4) Name two of the three ways in which firms can be organized, as discussed in Ch. 19.

C. (10 pts) Mark, with utility function  $U = \sqrt{Y}$ , where  $Y = \text{income}$ , is offered the choice of receiving an income of \$1600 or participating in a gamble that pays \$100 with a probability of 70% and \$10,000 with a probability of 30%.

- (1) Which will Mark choose?
- (2) Now Mark is offered the option of buying insurance that costs \$7500, but pays him \$9900 if he gets the lower-paying outcome. Will Mark choose to buy insurance and participate in the gamble?

D. (30 pts) Alana, with utility function  $U(C_1, C_2) = C_1 + \ln C_2$ , where  $C_1$  is her consumption of goods and services this time period and  $C_2$  is her consumption next time period, receives  $M_1$  of income this time period and will receive  $M_2$  of income next time period.

- (1) What is the name for the kind of preferences that Alana has?
- (2) Write down Alana's budget constraint if she can both borrow and lend at the same interest rate  $r$  and there is no inflation.
- (3) What is Alana's marginal rate of substitution between  $C_1$  and  $C_2$ ?
- (4) What is her demand function for  $C_2$ ?
- (5) What is her demand function for  $C_1$ ?
- (6) If  $r = .20$ ,  $M_1 = \$400$ , and  $M_2 = \$600$ , is Alana a net borrower or a net lender?

E. (20 pts) Lempel Industries produces paper clips using the following production function:

$$Q = 50K + 20L$$

$Q$  = units of output,  $K$  = units of capital, and  $L$  = units of labor  
Capital costs \$80 a unit and labor costs \$40 a unit.  $Q$  sells for \$2 a unit.

- (1) Does the production function exhibit increasing, constant, or decreasing returns to scale?
- (2) Write down the profit function for Lempel.
- (3) What is the marginal product of labor?
- (4) How much labor should Lempel buy?