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Economics 271
Spring Semester 2000-01
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Review Problems for Test #1

These problems are identical in format to those on the test. Be sure and bring a calculator to the test.

A. Answer True, False, or Uncertain, and briefly explain your answer.

(1) Inferior goods have negative price elasticity.

(2) A change in consumer surplus is an approximate measure of a consumer's change in well–being except when the utility function is Cobb–Douglas in form.

(3) The consumer is better off in period b than in period t if the Paasche price index,

$$P_p = \frac{P_1^t X_1^t + P_2^t X_2^t}{P_1^b X_1^t + P_2^b X_2^t}$$, is greater than 1.

(4) The production function $Q = 3K\sqrt{L}$ exhibits constant returns to scale.

B. Short answers.

(1) What is the demand function for X if $U = 4X^3Y^3$?

(2) Given a supply curve $Q_S = 6P$, when the price changes from 5 to 6, what is the associated change in producer surplus?

(3) A person has the utility function $U = X + 2Y$. What is the marginal rate of substitution between X and Y?

(4) Given the above utility function, if the prices are $P_X = 3$ and $P_Y = 4$, what is the budget share of X?

For the following problems, 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.

C. A risk–loving person with utility function $U = Y^2$, where Y = income, is offered the choice of receiving his income of $50 or participating in a gamble that pays $100 with a probability of 25% and $20 with a probability of 75%. Which will he choose?

D. A person has the utility function $U = \ln C + 2\ln R$, C = dollar units of consumption and R = weekly hours of leisure.

(1) What is the marginal rate of substitution between C and R?

(2) Given a wage rate W = $10/hr and nonlabor income M = $240, graph the budget constraint.

(3) What is the demand function for leisure?

(4) How much leisure is taken?

(5) The firm where this person works is trying to discourage people from working overtime. The hourly wage is changed so that:

W = $10/hr for hours worked ≤ 40
W = $8/hr for any hours worked in excess of 40 per week

Graph the new budget constraint.

(6) Would this person increase, not change, or decrease hours worked?

E. A firm produces output Q according to the production function:

$$Q = 2K^{1/3} L^{1/3}$$

K = units of capital and L = units of labor.
Capital costs $3 a unit and labor costs $2 a unit. Q sells for $6 a unit.

(1) Write down the profit function for this firm. What are the two conditions for profit maximization?

(2) How much capital will the firm use?

(3) How much labor will the firm use?

(4) How much output will the firm produce?