

HOMEWORKS FOR REVIEW
MICRO THEORY ECON 3352
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The questions below are basic to the understanding of microeconomic analysis. Please make sure you know how to handle them as well as all the questions from exams I, II and III and all the suggested homeworks to our course ECON 3352 posted in my website.

Q.1: A consumer purchases only two goods: food (F) and clothing (C). The consumer has to decide how many units of each good to purchase each month. Suppose the consumer's level of satisfaction when she purchases F units and C units is measured by the product F.C. Goods cost money and the consumer has a limited income (I). Suppose she can not spend more than I during the month and each unit of F costs P_F and each unit of C costs P_C . Answer:

- a) What is the objective function for this problem and what is the constraint?
- b) Which variables (P_F , F, P_C , C, I) are exogenous? Which are endogenous? Explain.
- c) Write a concise statement of this constrained maximization problem.

Q.2: Let the consumer choice problem be: $\text{Max } U(x, y)$ subject to $P_x x + P_y y = I$. Define the Lagrangean for this problem and find the first-order-conditions for an interior optimum ($x > 0$ and $y > 0$).

Q.3: Suppose the market demand curve for apples is given by $Q^d = 500 - 4P$, while the market supply curve is described by $Q^s = -100 + 2P$, where P is the price of apples in \$/barrel and quantities are in thousands of barrels per year.

- a) Find equilibrium price and quantities.
- b) What would happen if P is set at $P = \$50$? Explain the problem created by this price.

Q.4: Suppose a linear demand curve is given by $Q^d = 400 - 10P$. What is the price elasticity of demand at $P=30$? And at $P = 10$? Interpret your answers.

Q.5: The income elasticity of demand ($\epsilon_{Q,I}$) for selected food products is reported below:

Product	estimated $\epsilon_{Q,I}$
Peaches	1.43
Apples	1.32
Milk	0.50
Butter	0.37
Margarine	-0.20
Flour	-0.36

Interpret the income elasticity of apples. Interpret the income elasticity of margarine.

Q.6: Suppose $Q^d = 40 - 4P$ represents a consumer's monthly demand curve for milk, where Q is the number of gallons of milk purchased when the price is P dollars per gallon.

- a) What is the consumer surplus per month if the price of milk is \$3 per gallon?
- b) What is the increase in consumer surplus if the price falls to \$2 per gallon?

Q.7: Let the production function be of Cobb-Douglas type: $Q = f(L, K) = AL^\alpha K^\beta$, where A, α , and β are positive constants. Then:

- a) Find the marginal products of labor and capital.
- b) Recalling that $MRTS_{L,K} = MP_L/MP_K$, find it for this production function.