

Quiz #1 Postmortem: Econ 222

February 24, 2000

Partial Answers

Part I: Identification

1. Gini Coefficient: Measure of inequality in the distribution of income, wealth etc. Equals 0 if complete equality; 1 if complete inequality. Calculated as twice the area between the Lorenz curve and the 45^o line denoting complete equality. May also be calculated by measuring relative deprivation, where deprivation is proportional to the sum of the gaps between each citizen's income and those with higher incomes.
2. $MRT = MRS^1 + MRS^2$ ~ necessary condition for efficient distribution of public goods.
3. Exclusion Principle: For most commodities it is possible to exclude others from using your commodity, but this is not so in the case of public goods, such as National Defense or broadcast TV, which are said to violate the exclusion principle.
4. Intransitive Social Ordering: A social ordering is a decision by a society about how to rank its options (alternative social states). A social ordering is intransitive if alternative A is preferred to B and B preferred to C but C preferred to A.
5. Utilitarianism: Philosophy that states that the goal of society should be to maximize the sum total of happiness. Championed by Bentham and John S. Mill

Part II: Should we build the bridge? (60 points – 30 minutes)

1. Since $R=pq=11q - q^2/10000$, profit maximization requires $dR/dq = 11 - q/5000 = dC/dq = 1$, so $q = 50,000$ and $p = \$6$. Revenue is \$300,000, costs are \$250,000 and economic profits \$50,000. Consumer surplus is $(\$11-\$6) \times 50,000/2 = \$125,000$. It would pay to bid up to \$50,000 for the right to operate the bridge.
2. As French engineer Emile Dupuit, recognized in 1844, setting price equal to marginal cost of \$1.00 will maximize the sum of consumer surplus plus profits. $Q = 50,000$, $R = \$100,000$, $C_s = \$500,000$, $C = 300,000$, and the operation yields a loss of \$200,000 which must be covered by tax revenue. Consumer surplus is \$500,000 and the net gain is $\$500,000 - \$300,000 + \$100,000 = \$300,000$
3. If free, 110,000 people will use the bridge and costs will be \$310,000. Consumer surplus will be \$605,000 and so the net gain will be \$295,000.

The price of \$1.00 is better than zero because the value of the service to those who are willing to pay less than \$1.00 is less than the marginal cost of having them use it. Marginal cost pricing, $p = \$1.00$, maximizes the excess of the value of the commodity to society over and above the cost of producing it. That is the efficient solution. To pay for the shortfall from general tax revenue may be regarded as unfair: why should those who don't use the bridge have to pay for it? Further, the tax is likely to result in a dead-weight loss.

Two students showed that a price of \$3.76 would yield just enough revenue to cover costs; this would be a "second-best" solution maximizing the sum of consumer surplus plus profits, subject to the constraint that profits be non-negative. Consumer surplus would be \$261,945.70. Thus there is a \$38,000 loss if we insist that the state enterprise not lose money.

One student correctly pointed out that it may be possible to use discriminatory pricing to generate enough revenue without violating the efficiency condition. See Nicholson, pp 625-28.

Congratulations! The median grade was 90!!