Econ 1A **Fall, 2012**

Practice Questions for the Final

Note – these questions show the format of the questions on the final. The final will be comprehensive. All parts of the class have an equal chance of appearing. But the questions below more heavily emphasize the later parts of the class, to make sure that you get to practice those before the final.

1. PERFECT COMPETITION –

The first aim of all economic policy is to achieve efficiency. A necessary condition for efficiency is that p = mc.

(a) Prove that a profit maximizing perfectly competitive firm always meets this necessary condition for efficiency.

NECESSARY CONDITION FOR EFFICIENCY IS P = MC

PROFIT MAX => MR = MC

BUT for a firm in Perfect Competition, MR = P (demand curve is completely elastic).

Thus firm sets P = MC.

(b) Assuming that for each firm in a competitive industry SMC = b+2cq when STC = $a+bq+cq^2$. Suppose the cost of each firm is given by STC = $72+4q+2q^2$. Calculate the profit maximizing output for the firms when p = 16.

Profit Max => MR = P = MC

So P = 16 = SMC = 4 + 4q $\rightarrow$ q* = 3

(c) Calculate the profits or losses of the firms above when p = 16?

$\Pi = TR - TC = 16\times3 - (72 + 4\times3 + 2\times3\times3)$

$= 48 - 102 = -54$

(e) Calculate the market price at which profits would be zero?

$\Pi = 0 \rightarrow P = SMC$ and $P = SAC$

$\rightarrow \quad 4 + 4q = \frac{72}{q} + 4 + 2q$

$\rightarrow \quad q^* = 6, P^* = 28$

(f) What Law of Production do the firms **costs** described above satisfy?

LAW OF DIMINISHING RETURNS

2. Suppose the wedding dress industry is a **perfectly competitive** constant cost industry. Suppose also that market demand for wedding dresses is described by Q = 10,000 – 10P. Suppose individual firms have cost functions of LTC = 20,000+100q+2q^2 (LTC = 0 if q = 0) (so that LMC is 100+4q). What is the market price, how much does each firm produce, and how many firms are there in the industry in the long run?

In the long run the firm satisfies two conditions.

Profit maximization → MR = P = LMC

Free Entry → π = 0 → P = LAC

Thus at output level of each firm LMC = LAC

→ $100 + 4q = \frac{20{,}000}{q} + 100 + 2q$ → q* = 100, P* = 500

At P = 500, industry output, from the demand curve, is Q = 10,000 - 10×500 = 5,000

The number of firms is thus 5,000/100 = 50

3. EXTERNALITIES Suppose demand in the perfectly competitive fish market can be described by the equation $P = 10 - (Q_d/2)$, while supply is described by $P = 2 + (Q_s/2)$.

(a)

Equilibrium Price comes from setting $10 - (Q/2) = 2 + (Q/2) \rightarrow Q^* = 8, P^* = 6$

$CS = 0.5 \times (10-6) \times 8 = 16$

$PS = 0.5 \times (6-2) \times 8 = 16$

$TS = CS + PS = 32$

$P = MC$ so $MC = 6$

(b) Suppose there is an external cost of $2 per fish, associated with environmental demage. Calculate

The true cost curve, incorporating the external cost of the fish, is $P = 4 + (Q_s/2)$.

Efficient Price comes from setting $10 - (Q/2) = 4 + (Q/2) \rightarrow Q^* = 6, P^* = 7$

$DWL = 0.5\times(8\text{-}6)\times(8\text{-}6) = 2$

Socially Efficient Price ___________

Socially Efficient Quantity ___________

Deadweight Loss at free market price ___________

(b) What size tax must be levied to get the socially efficient outcome? What is the deadweight loss associated with this tax?

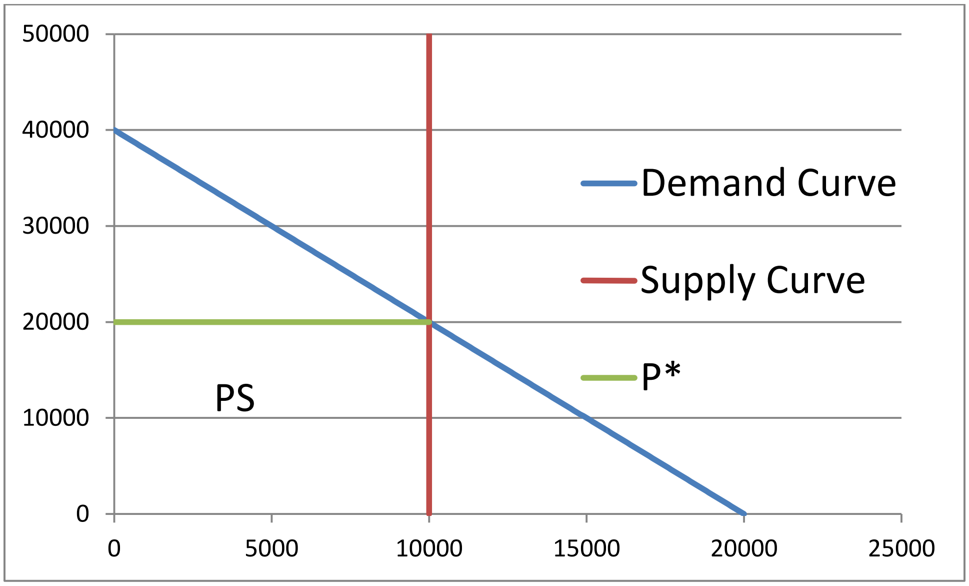
Tax = $2, no deadweight loss.

Tax ___________

Deadweight Loss ______

4. Suppose there are 10,000 acres of land in Davis, and the city size is fixed (the citizens have passed a "no-growth" ordinance). The demand for land in the city is described by Rent = 40,000 – 2Q, where Q is the number of acres rented and Rent is the annual rental per acre in $.

(a) Show above the demand and supply of city land at each rental (with the values at which curves intersect axes). Calculate the market rental rate, consumer and producer surplus (7)



market rental rate = $20,000 per acre

CS = .5×20,000×10,000 = $100 million

PS = 20,000×10,000 = $200 million

(b) The city proposes and annual parcel tax of $10,000 per acre on **land owners** to raise revenue. Calculate the new level of land rents. (2)

Market Land Rents stay the same

(c) Calculate the Deadweight Loss, in $ per year, from the parcel tax. Explain the economic intuition behind your answer (2)

DWL = 0. Since the land is supplied whatever the net rental payment to the owners, the tax does not change the quantity of land supplied, so there is no deadweight loss.

(d) Since some parcels have $1m homes built on them, and others have homes worth only $200,000 it is argued that the parcel tax lets off the owners of the expensive homes too lightly. As an alternative the city proposes to raise the same amount of revenue by a tax from property owners that is 10% of the rental value of the land plus the structures built on it. Would the **deadweight loss** in the long run of such a tax be greater or less than the parcel tax. Explain your answer (4)

The tax on the value of structures will lead some property owners to reduce their investments in upgrading the structures, since the effective price of such an upgrade will be increased by the tax levied every year. That decline in investment relative to what is optimal for efficiency, will lead to deadweight loss.

5. Suppose in downtown San Francisco the number of on street parking places is fixed at 20,000. Suppose also that they are metered, and the city has set the charge at $1 per hour, with a maximum stay of two hours. The market clearing price of such spaces is $6 per hour.

(a) What is the loss in $ per hour from this policy? (2)

$20{,}000 \times (6-1) = \$100{,}000$

(b) State three forms that this loss takes (6)

Cars circling waiting for spaces.
Congestion time costs to other cars caused by the cars in search of parking spaces.
Highest value users (those with greatest $ time cost) not getting to use spaces.
People parking at a distance from their destination because space is free there.

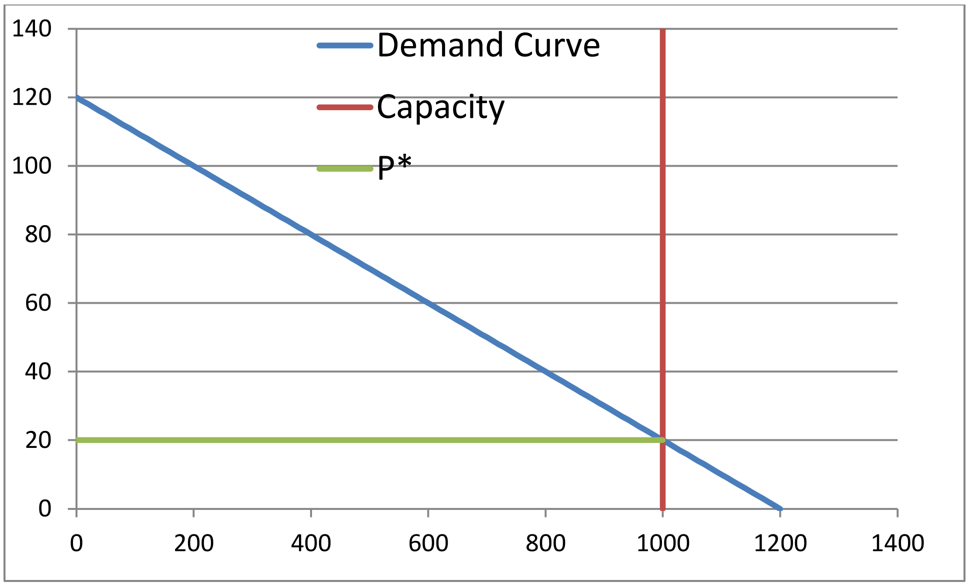
(c) The city finds that by reducing the maximum stay to 20 minutes it can reduce demand for the spaces sufficiently so that there are always now some free spaces. Has it eliminated the losses identified in (a) by this policy? Explain. (3)

Reducing the value of the parking spaces by very short time limits just reduces the social value of the parking spots. At optimal pricing there would be no time limit on parking.

(d) Shopkeepers would oppose raising prices to market clearing levels, fearing that it would discourage people coming to shop in San Francisco. Are their fears justified? Explain. (3)

The true cost of shopping would not change. Money fees would be exchanged for an equivalent value of waiting time spent. Indeed since with market clearing pricing the parkers would now be more high income individuals, who would be likely to spend more in the stores.

6. The Bridge Too Far has an operating cost per day of \$60,000 and a capacity of 1,000 cars. The demand curve for the bridge per day is $Q_d = 1200 - 10P$. Calculate the efficient price for the bridge if it is operating. Is it efficient to operate the bridge? Explain. (5)



Efficient Price = \$20

Revenue from tolls = \$20×1,000 = \$20,000

Consumer Surplus Generated from Operating the Bridge = .5×(120-20)×1000 = \$50,000

Even though the toll revenue is less than the operating cost per day, it is efficient to operate the bridge since the sum of CS + Revenue > operating cost.

7. We assumed in this course that the aim of economic policy should be to maximize efficiency. Suppose that a treatment facility for drug addicts just released from prison sentences needs to be established in some neighborhood. It can either be located in West Davis or Del Paso Heights, a poor neighborhood in Sacramento. It would reduce property values by $2 m in Central Davis, but only by $500,000 in Del Paso Heights.

Explain to someone not familiar with economics why the facility should be located in the poor neighborhood. Responses will be graded on coherence, organization, and use of examples.

This will be discussed in the review Sunday.