**NTU SSS Economics HE1001**

**Problem Set 2: Perfect Competition and Monopoly I**

**This problem set will be discussed during the tutorials in Week 10 (23-24 Oct)**

**Perfect Competition**

1. An increase in the demand for movies also increases the salaries of actors and actresses. Is the long-run supply curve for films likely to be horizontal, download sloping or upward sloping? Please use a graph to explain.

The long-run supply curve depends on the cost structure of the industry. Assuming there is a relatively fixed supply of actors and actresses, as more films are produced, higher salaries must be offered. Therefore the industry experiences increasing costs. In an increasing-cost industry, the long-run supply curve is upward sloping. Thus the supply curve for films would be upward sloping.

2. Suppose you are given the following information about a particular industry:



Assume that all firms are identical, and that the market is characterized by perfect competition.

1. Find the equilibrium price, the equilibrium quantity, the output supplied by the firm, and the profit of each firm.

Equilibrium price and quantity are found by setting market demand equal to market supply:   
6500 − 100*P* = 1200*P*. Solve to find *P* = $5 and substitute into either equation to find *Q* = 6000. To find the output for the firm set price equal to marginal cost: so *q* = 500. Profit is total revenue minus total cost or .



Notice that since the total output in the market is 6000, and each firm’s output is 500, there must be 6000/500 = 12 firms in the industry.

1. Would you expect to see entry into or exit from the industry in the long run? Explain. What effect will entry or exit have on market equilibrium?

We would expect entry because firms in the industry are making positive economic profits. As new firms enter, market supply will increase (that is, the market supply curve will shift down and to the right), which will cause the market equilibrium price to fall, all else the same. This, in turn, will reduce each firm’s optimal output and profit. When profit falls to zero, no further entry will occur.

1. What is the price at which each firm would sell its output in the long run equilibrium? Is profit positive, negative, or zero at this price?

In the long run profit falls to zero, which means price falls to the minimum value of *AC*. To find the minimum average cost, set marginal cost equal to average cost and solve for *q*:



Therefore, the firm will not sell for any price less than $3.80 in the long run. The long-run equilibrium price is therefore $3.80, and at a price of $3.80, each firm sells 380 units and earns an economic profit of zero because *P* = *AC*.

Note that we assume that input prices are constant.

**Monopoly I**

3. A monopolist faces the following demand Q=100-2P and has the total cost TC=5Q+Q2.

1. Derive the expression for the marginal revenue function.

P= 50-0.5\*Q

MR = d(TR)/dQ = d(50Q-0.5\*Q2)/dQ = 50-Q

1. Calculate the profit maximizing output.

MR=MC=>50-Q=5+2Q=>Q\*=15



4. Please prove that, in a monopolistic market,



5. A firm's demand curve is given by P = 500 - 2Q. The firm's current price is $300 and

the firm sells 100 units of output per week. If the firm’s marginal cost is zero, is the firm maximizing profit? If your answer is not, what should be the optimal quantity?

TR=(500-2Q)\*Q

=>MR=500-4Q

MR=MC=>500-4Q=0=>Q\*=500/4=125 (optimal quantity), P\*=250

=>The firm is not maximizing profit.