Homework 1

due September 14, 2018

Microeconomics 2
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m2

1. Consider

$$S(q) = \frac{AC}{MC}.$$

$S(q)$ is a measurement of economies of scale such that
   - if $S(q) > 1$: economies of scale;
   - if $S(q) = 1$: constant economies of scale;
   - if $S(q) < 1$: dis-economies of scale;

    Find the range of outputs for which the cost function $C(q) = f + cq^2$ is characterized by (i) economies of scale, (ii) diseconomies of scale, and (iii) constant economies to scale. Are there economies of scale if $f = 0$? [25 pts]

2. Nastya is in the process of setting up a small taxi firm. Her plan is to lease 3 cars on a four-year contract and hire 6 drivers to operate them.

    (a) Explain if the production function of Nastya's firm is of fixed proportions. [5p]
    (b) Nastya has two alternative options for the cars. She can buy either *Hyundai Solaris* which is cheaper but has higher operation costs or *Skoda Octavia* which is more expensive but cheaper to operate. Plot the cost structures of the two alternative options and explain if this is a L-R or a S-R decision. [10p]
    (c) Nastya also has to consider how she will pay her drivers. She can pay them with a fixed wage so that they will drive more carefully but take less rides or she can pay them with bonuses so that they will drive faster and take more risks damaging the cars. Explain if this is a L-R or a S-R decision. [10p]

3. Sergey operates a profile selling books on Amazon.com. His best-selling item is "*Crime and Punishment*", which he currently sells for 449 rubles a copy, a price very similar to most of his competition. Sergey recently came across the diploma paper of an HSE graduate, who has calculated the demand elasticity of this book to be negative 0.8.

    (a) What does an elasticity of demand equal to negative 0.8 mean for a product in general? [5p]
    (b) How should Sergey use this information to improve his profits? [10p]

4. AirCrash is an airline that lately does not perform very well. The company owns 12 Airbus-a330 planes and employs 200 workers on a 1 million ruble salary per year each. 50 of those workers are on a 3-year contract and the rest have no contract. AirCrash has bought each aircraft for 1 billion rubles and can re-sell it immediately for 0.5 billion. The life expectancy of each aircraft is (another) 12 years. The company currently runs losses of around 98 million rubles a year. What would you consult this company (other than changing its name)? [10p]

5. {Updated} An employee is hired in a job that requires a car. The demand curve for car service for this employee is $q = 200 - 0.05p$, where q is the horse power of the car in hp and p is the price of the car in rubles per hp. The current price in the market is 1K rubles per hp. However the company offers to the employee a company car of 90 hp for 40K rubles. Find the employee's CS if she takes the company car and if she buys another car. What will she do? [25p]

Estimated completion time: 120 min
Difficulty level (normalized to exam standards): 1.5/5   2. 5/5   3. 4/5   4. 3/5   5. 6/5