

# Microeconomics — class 12

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**1.** American wheat is produced in perfect competition conditions. The long run average cost function of a farmer is U-shaped with minimum at production level 1000 bushels, equal to 3\$ for bushel.

a) What will be the parameters of (long run) equilibrium, if the market demand function is  $AD(p) = 2600000 - 200000p$ ?

b) After a positive demand shock the demand function was shifted up to  $AD'(p) = 3200000 - 200000p$ . What will happen in (very) short run, when the production is fixed? What will be the equilibrium and the profit of a single firm.

d) What will happen in the long run?

e) Show graphical analysis of the problem.

**2.** Electronic components are produced in a competitive industry using one of two technologies with cost functions  $c_1(y) = \frac{y^2}{2} + 8$  and  $c_2(y) = \frac{2y^2}{3} + 7$ .

Calculate the parameters of long run equilibrium (the number of firms using each technology, productions of these firms, aggregate production and price), if the aggregate demand function is  $d(p) = 7200 - 100p$ .

Describe the process of convergence to this equilibrium if the initial price is 8 and each technology is used (changing technology is described as closing firm using the former technology and opening a new firm using the latter technology).

**3.** In a competitive branch every firm has identical long run cost functions  $c(y) = y^2 + 16$ .

The demand is  $d(p) = 2000 - p$ .

Calculate the parameters of long run equilibrium.

**4.** In a competitive industry cost functions of a typical firm are described by:

the long time average cost  $LAC(y) = \frac{25}{y} + y$  and

the short time marginal cost  $SMC(y) = 4y - 10$ .

The aggregate demand is  $d(p) = 510 - p$ .

- a) Calculate the long run equilibrium.
- b) The government suddenly imposes a sales tax 5z per item. What will be the parameters of equilibrium.
  - (i) in the very short run (production fixed)
  - (ii) in short run (short run costs apply)
  - (iii) medium run (long run from the point of view of a firm, the number of firms fixed)
  - (iv) long run
- c) How the taxation burden is divided in each of these periods?
- d) Now the demand also changed to  $500 - 2p$ . How it changes the run equilibrium?

**5.** The market for window cleaning liquids in Poland is perfectly competitive and it is at its long run equilibrium. The firms in the market have technology with cost function, with current factor price treated as fixed  $c(y) = y^2 + 4$ .

- a) Calculate the parameters of this equilibrium if the aggregate demand function is  $d(p) = 600 - 2 \cdot p$ .
- b) The government introduced a tax 1 z for a bottle, explaining it as necessary to counteract alcoholism. What is going to happen:
  - (i) in very short run (immediately after introduction of the tax, production fixed);
  - (ii) in short run, with short run cost function  $c^S(y) = c(y) + \frac{1}{2}(\bar{y} - y)^+$ , where  $\bar{y}$  the production before the change (calculated in a);
  - (iii) in medium run (when the number of firms is fixed);
  - (iv) in long run.