Exam 2024-10-18. Calculators are allowed. Computers, notes, or any other materials are not allowed.

Multiple choice questions (24p)

Correct answer +3p, incorrect answer -1p, no answer 0p.

Make sure to consider all alternatives before making your choice.

1. Price of eggplants increases by 5%, and as a result the consumption of eggplants decreases by 10%. What is the price elasticity of demand for eggplants?

   (a) -0.2 (b) -0.5 (c) -1 (d) -1.5 (e) -2 (f) -5

2. A vendor faces a price elasticity of demand -3 and has a marginal cost of €12 per unit. What's a good rule-of-thumb estimate for its profit-maximizing unit price?

   (a) €9 (b) €12 (c) €16 (d) €18 (e) €24 (f) €36

3. Both Ann and Bob are risk averse and they have access to the same risky investment opportunity. Bob takes the chance while Ann gives it a pass. This rules out...

   (a) Ann being less risk averse than Bob.
   (b) Ann being more risk averse than Bob.
   (c) Ann having a lower initial wealth level than Bob.
   (d) Ann being infinitely risk averse.
   (e) None of the above.

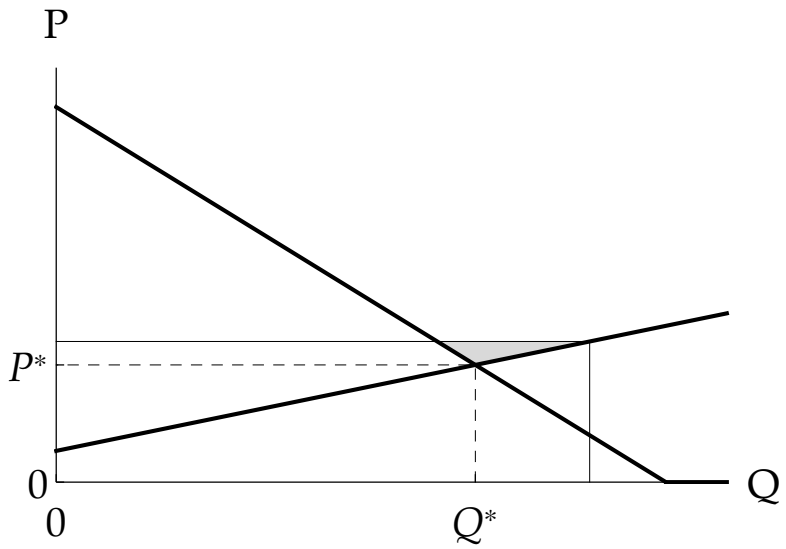
4. About half of a cafe's customers are college students. Students have a less price elastic demand for doughnuts than non-students. The cafe has just found out about a reliable student id card system, which would allow it to verify whether a person claiming student status really is a student. It would probably increase the cafe's profits if it...

   (a) increases the price for non-students.
   (b) increases the price for non-students, decreases the price for students.
   (c) increases the price for students.
   (d) increases the price for students, decreases the price for non-students.
   (e) None of the above.

5. The small village of Lintukoto has 100 households, each of which values the common New Year's fireworks by $q^d(p) = 20 - 4p$, where p is in euros and quantity in the number of rocket explosions. The cost of one rocket is €100. What is the efficient size of the firework display (in number of explosions)?

   (a) 0 (b) 10 (c) 15 (d) 16 (e) 19 (f) 20

6. The government is concerned about the plight of dairy farmers. It begins to purchase a certain amount of butter each year, which it gifts to municipalities. They use the gift in school lunches, which does not affect the market demand for butter. Consider the aggregate welfare effects of this policy in the supply and demand framework for butter, depicted below. What kind of a welfare effect is represented by the shaded region?



(a) Negative change: What used to be no surplus is now government expenditure.
(b) Negative change: What used to be producer surplus is now government expenditure.
(c) No net change.
(d) Positive change: What used to be no surplus is now consumer surplus.
(e) Positive change: What used to be no surplus is now producer surplus.

7. In which of the following cases would the pricing of a profit-maximizing monopolist cause no deadweight loss?

(a) It has zero marginal cost.
(b) It faces infinitely elastic demand.
(c) It faces unit elastic demand.
(d) It is owned by its customers, who are paid back the profits in the form of dividends.
(e) It has zero fixed cost.

8. A firm produces one product. It has no fixed costs, and has a marginal cost that is increasing in quantity produced. The technology of this firm exhibits...

(a) constant returns to scale
(b) decreasing returns to scale.
(c) diseconomies of scope.
(d) economies of scope.
(e) increasing returns to scale.
(f) None of the above.

Text questions

Answer briefly, in 2–5 sentences.

I (15p) The European Union is threatening to impose a tariff on Chinese electric vehicles, to be levied at 40% on top of the import price. In ongoing negotiations, Chinese manufacturers have offered to voluntarily restrict their vehicle exports to Europe, hoping this would deter the EU from imposing the tariff. Compare the welfare effects of a tariff and a voluntary export restriction (VER) in the EU market for Chinese electric vehicles. Assume that the quantity of imports under the tariff would be the same as under the VER.

II (15p) Your friend has an idea to help poor people. Everyone in the country will be given the same fixed monthly "basic income", which will be paid for by an increase in the tax rate on consumption (VAT). Since high-income people consume more, they will be the net payers of this policy; conversely, low-income people consume less and so end up being the net beneficiaries. What about a person in the middle, who ends up paying the same amount of additional VAT as they receive back as the basic income? Your friend claims that the policy obviously has no direct impact on the welfare of such net-zero worker-taxpayers. Explain the error of this claim. Do not invoke administrative costs, externalities, etc.; rather, use only the tools of basic consumer theory. Use a graph to illustrate your argument.

Problem solving questions. Show the arguments and steps behind your reasoning, backed up by calculations where relevant.

III (22p) The market demand for slop comes from numerous pet owners, who feed slop to their pet ducks. In the long run, the total number of pet ducks kept by their owners depends heavily on the price of slop. The long run demand for slop is $P^D_{LR}(q) = 100 - q$, where price is in €/barrel and q in millions of barrels per year. In the short run the number of pet ducks is fixed and the demand for slop is $P^D_{SR}(q) = P^D_{LR}(q) + (x - q)$, where x is the ideal amount of slop fed to existing pet ducks. In long run equilibrium, x equals equilibrium consumption. (Even in the short run, it is possible to consume more or less than x by adjusting the composition of duck feed.) The supply of slop is $P^S(q) = 10 + 0.5q$. The supply comes from numerous slop extractors, each with identical individual supply. Initially, the market for slop is in both short run and long run equilibrium, with consumption at $x_0 = 60$.

(a) A new pest wipes out half of the suppliers of slop. How much is the production of slop reduced in the short run?

(b) Continued from IIIa. In the long run, the number of pet ducks adjusts to the decrease in slop supply. Describe the evolution of the price of slop, starting from the initial situation.

IV (24p) QuarkVibe Systems has developed a new engine that is powered by quantum woo. It has so far paid \$3b in development costs. The relevant discount rate is 10%. Engine production would incur a fixed cost of \$5b per year. The engine would produce a yearly net revenue (i.e., revenue net of variable costs) of X \$b. According to QuarkVibe's best estimate, X is equally likely to be either 2, 4, or 6 \$b. Launching the product will reveal X after one year of sales. Alternatively, QuarkVibe could wait for more external information to arrive before commencing production; it would then find out X, but this would delay the possibility to launch the product by two years (i.e, until year $t = 2$).[1] It is known that starting 3 years from now (year $t = 3$) the quantum woo technology is superseded by fusion power and can no longer yield revenue.

(a) (16p) What is QuarkVibe's optimal decision and its value?

(b) (8p) Clairvoyant Consulting offers QuarkVibe its services and promises that, at a price, it would reveal the true value of X. How much is this service worth to QuarkVibe if Clairvoyant's predictions are guaranteed to be correct?

[1]For discounting purposes, payment flows in period $t = 0$ refer to now immediately, period $t = 1$ one year from now, etc.